

## CHAPTER 16

# Working Capital Management

What do U.S. Airways, Apple Computer, Clorox, Kellogg, Dow Chemical, and Family Dollar Stores have in common? Each led its industry in the latest CFO Magazine annual survey of working capital management, which covered the 1,000 largest U.S. publicly traded firms. Each company is rated on its “days of working capital,” which is the amount of net operating working capital required per dollar of daily sales:

$$\text{Days of working capital (DWC)} = \frac{\text{Receivables} + \text{Inventory} - \text{Payables}}{\text{Average daily sales}}$$

The average U.S. firm’s DWC was 51 days, and the range was from a low of –154 for CIGNA, a health care provider that collects premiums in advance of payouts, to +475 for Toll Brothers, a homebuilder with a huge inventory of unsold houses. Tiffany, the jeweler, had a ratio of 207 due to its policy of extending credit to boost sales, while Apple achieved a ratio of –29 largely by making Internet sales and being paid by credit cards well in advance of shipping products and paying its suppliers.

Variations across industries reflect different operating conditions, but there are also huge differences within industries. For example, the leader in the semiconductor sector, MEMC Electronic Materials, had an investment of only 21 days sales in working capital versus 111 days for another semiconductor firm, Novellus Systems. Ken Hannah, MEMC’s CFO, made this statement to CFO Magazine: “Every dollar we free up from working capital can be deployed back into the business.” He went on to say that MEMC managed to trim its working capital by 26 days, which released about \$340 million. Assuming this money was used to repay debt that cost 6%, this would boost before-tax profits by \$20.4 million.

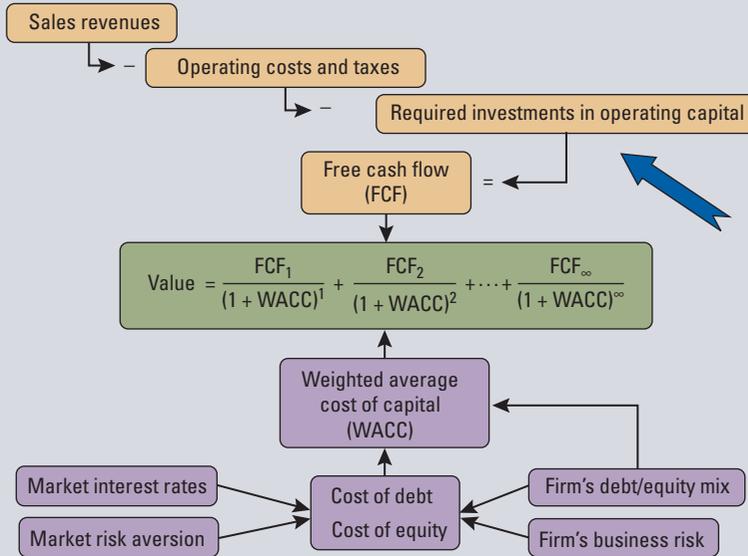
How can a company lower its DWC? MEMC reduced its inventories by adopting just-in-time manufacturing processes, and it lowered receivables by requiring customers to pay for goods before they were shipped. It did not “stretch” its own payables. Rather, it asked for and received discounts of as much as 10% in exchange for early payments, which actually raised its DWC but also increased its net income. Keep MEMC’s actions in mind as you read this chapter.

Sources: Various issues of CFO, including an article by Randy Myers, “Cleaner (Balance) Sheets: The 2009 Working Capital Scorecard,” CFO, June 2009. For an update on CFO’s survey, go to <http://www.cfo.com> and look for “Working Capital Scorecard” under the “Special Reports” tab.

## Corporate Valuation and Working Capital Management

Superior working capital management can dramatically reduce required investments in operating capital, which

can lead in turn to larger free cash flows and greater firm value.

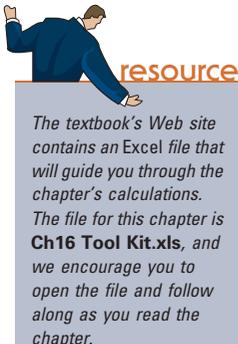


Working capital management involves two basic questions: (1) What is the appropriate amount of working capital, both in total and for each specific account, and (2) how should working capital be financed? Note that sound working capital management goes beyond finance. Indeed, improving the firm's working capital position generally comes from improvements in the operating divisions. For example, experts in logistics, operations management, and information technology often work with engineers and production specialists to develop ways to speed up the manufacturing process and thus reduce the goods-in-process inventory. Similarly, marketing managers and logistics experts cooperate to develop better ways to deliver the firm's products to its customers. Finance comes into play in evaluating how effective the firm's operating departments are relative to other firms in its industry and also in evaluating the profitability of alternative proposals for improving working capital management. In addition, financial managers decide how much cash their companies should keep on hand and how much short-term financing should be used to finance their working capital.

Here are some basic definitions and concepts.

1. **Working capital**, sometimes called *gross working capital*, simply refers to current assets used in operations.<sup>1</sup>
2. **Net working capital** is defined as current assets minus all current liabilities.

<sup>1</sup>The term "working capital" originated with the old Yankee peddler, who would load his wagon with pots and pans and then take off to peddle his wares. His horse and wagon were his fixed assets, while his merchandise was sold, or turned over at a profit, and thus was called his *working capital*.



3. **Net operating working capital (NOWC)** is defined as current *operating* assets minus current *operating* liabilities. Generally, NOWC is equal to cash required in operations, accounts receivable, and inventories, less accounts payable and accruals. Marketable securities not used in operations, cash in excess of operating needs, and other short-term investments are generally not considered to be operating current assets, so they are typically excluded when NOWC is calculated. The firm itself determines how much of its cash is required for operations, but all of the cash of most firms is used in operations.

## 16.1 CURRENT ASSET HOLDINGS

Current assets can be divided into two categories, operating and nonoperating. Operating current assets consist of cash plus marketable securities held as a substitute for operating cash, inventories, and accounts receivable. These are assets that are necessary to operate the business. Nonoperating current assets consist of any other current assets, principally short-term securities in excess of what is required in operations, funds held in case a good merger opportunity arises, cash from the sale of a stock or bond issue before the funds can be invested in fixed assets, or funds held in case the firm loses a lawsuit and is required to compensate the winning party. *Our focus in this section is strictly on operating current assets.*

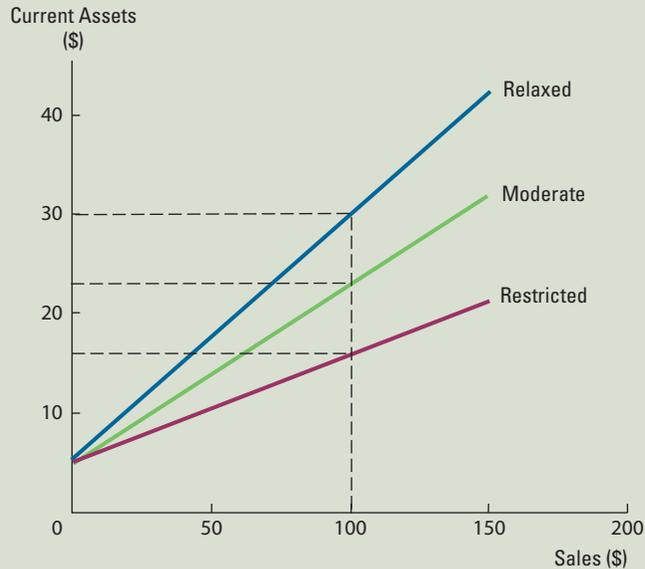
The amount of operating current assets held is a policy decision, and one that affects profitability. Figure 16-1 shows three alternative policies regarding the size of the firm's operating current assets. The top line has the steepest slope, which indicates that the firm holds a lot of cash, marketable securities, receivables, and inventories relative to its sales. If receivables are high, the firm has a liberal credit policy that results in a high level of accounts receivable. This is a **relaxed policy**. On the other hand, if a firm has a **restricted**, *tight*, or "*lean-and-mean*" **policy**, holdings of current assets are minimized. A **moderate policy** lies between the two extremes.

We can use the Du Pont equation to demonstrate how working capital management affects the return on equity:

$$\begin{aligned} \text{ROE} &= \text{Profit margin} \times \text{Total assets turnover} \times \text{Equity multiplier} \\ &= \frac{\text{Net income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Assets}} \times \frac{\text{Assets}}{\text{Equity}} \end{aligned}$$

A relaxed policy means a high level of assets and hence a low total assets turnover ratio; this results in a low ROE, other things held constant. Conversely, a restricted policy results in low current assets, a high turnover, and hence a relatively high ROE. However, the restricted policy exposes the firm to risk, because shortages can lead to work stoppages, unhappy customers, and serious long-run problems. The moderate policy falls between the two extremes. The optimal strategy is the one that management believes will maximize the firm's long-run earnings and thus the stock's intrinsic value.

Note that changing technologies can lead to changes in the optimal policy. For example, if a new technology makes it possible for a manufacturer to produce a given product in 5 rather than 10 days, then work-in-progress inventories can be cut in half. Similarly, retailers such as Wal-Mart and Home Depot have inventory management systems that use bar codes on all merchandise. These codes are read at the cash register, this information is transmitted electronically to a computer that adjusts the remaining stock of the item, and the computer automatically places an order with the supplier's computer when the stock falls to a specified level. This process lowers the "safety stocks" that would otherwise be necessary to avoid running out of stock. Such systems have dramatically lowered inventories and thus boosted profits.

**FIGURE 16-1** Current Asset Investment Policies (Millions of Dollars)

Policy	Current Assets Per \$100 of Sales	Turnover of Current Assets: Sales/CA
Relaxed	\$30	3.3
Moderate	23	4.3
Restricted	16	6.3

**Self-Test**

Identify and explain three alternative current asset investment policies.

Use the Du Pont equation to show how working capital policy can affect a firm's expected ROE.

What are the reasons for not wanting to hold too little working capital? For not wanting to hold too much?

## 16.2 CURRENT ASSETS FINANCING POLICIES

Investments in operating current assets must be financed, and the primary sources of funds include bank loans, credit from suppliers (accounts payable), accrued liabilities, long-term debt, and common equity. Each of those sources has advantages and disadvantages, so a firm must decide which sources are best for it.

To begin, note that most businesses experience seasonal and/or cyclical fluctuations. For example, construction firms tend to peak in the summer, retailers peak around Christmas, and the manufacturers who supply both construction companies and retailers follow related patterns. Similarly, the sales of virtually all businesses increase when the economy is strong, so they increase current operating assets during booms but let inventories and receivables fall during recessions. However, current assets rarely drop to zero—companies maintain some **permanent current operating assets**, which are the current operating assets needed even at the low point of the

business cycle. For a growing firm in a growing economy, permanent current assets tend to increase over time. Also, as sales increase during a cyclical upswing, current assets are increased; these extra current assets are defined as **temporary current operating assets** as opposed to permanent current assets. The way permanent and temporary current assets are financed is called the firm's **current operating assets financing policy**. Three alternative policies are discussed next.

### Maturity Matching, or “Self-Liquidating,” Approach

The **maturity matching**, or **“self-liquidating,” approach** calls for matching asset and liability maturities as shown in Panel a of Figure 16-2. All of the fixed assets plus the permanent current assets are financed with long-term capital, but temporary current assets are financed with short-term debt. Inventory expected to be sold in 30 days would be financed with a 30-day bank loan; a machine expected to last for 5 years would be financed with a 5-year loan; a 20-year building would be financed with a 20-year mortgage bond; and so on. Actually, two factors prevent an exact maturity matching: (1) The lives of assets are uncertain. For example, a firm might finance inventories with a 30-day bank loan, expecting to sell the inventories and use the cash to retire the loan. But if sales are slow, then the cash would not be forthcoming and the firm might not be able to pay off the loan when it matures. (2) Some common equity must be used, and common equity has no maturity. Still, if a firm attempts to match or come close to matching asset and liability maturities, this is defined as a *moderate current asset financing policy*.

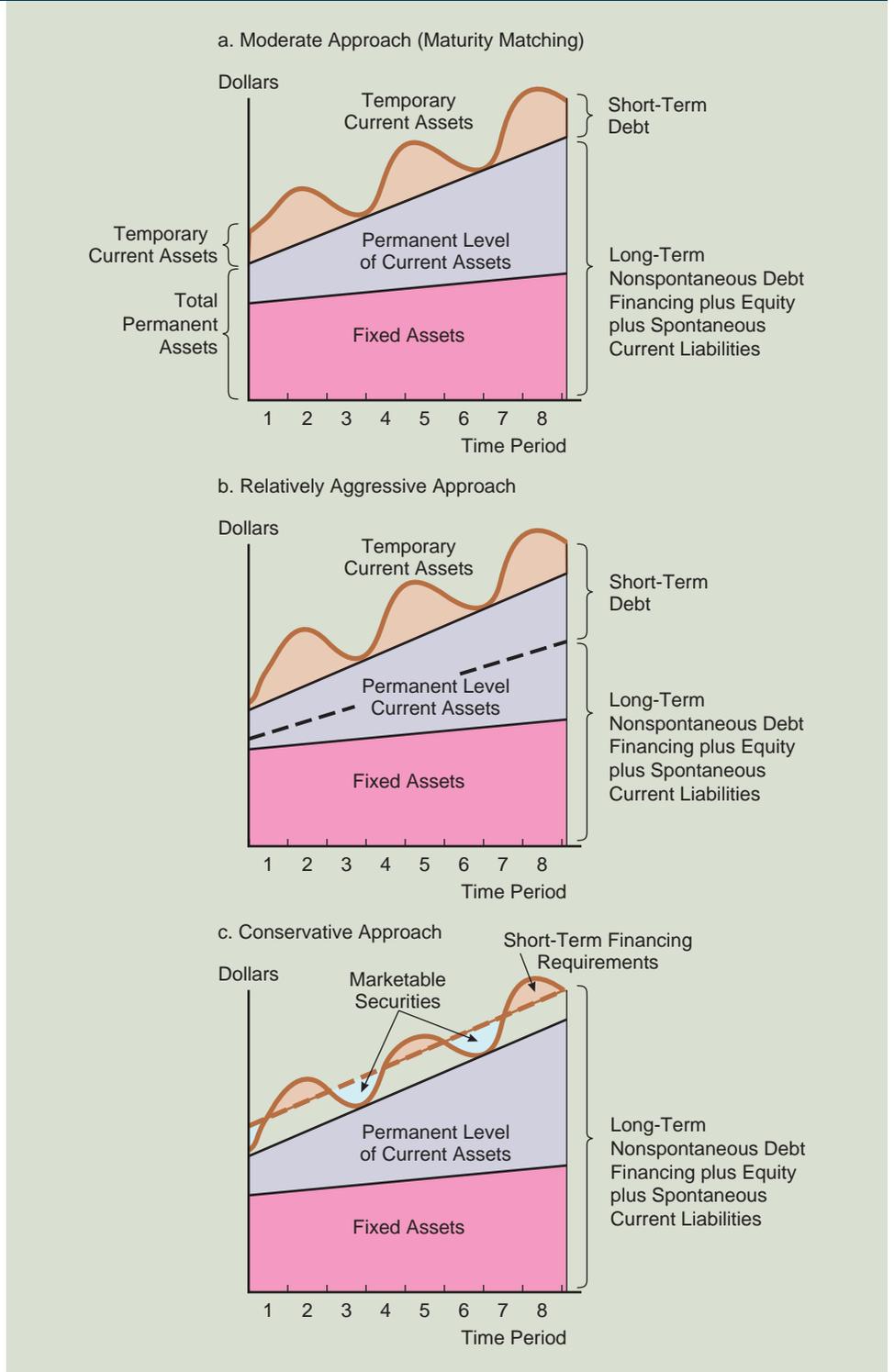
### Aggressive Approach

Panel b of Figure 16-2 illustrates the situation for a more aggressive firm that finances some of its permanent assets with short-term debt. Note that we used the term “relatively” in the title for Panel b because there can be different *degrees* of aggressiveness. For example, the dashed line in Panel b could have been drawn *below* the line designating fixed assets, indicating that all of the current assets—both permanent and temporary—and part of the fixed assets were financed with short-term credit. This policy would be a highly aggressive, extremely nonconservative position, and the firm would be subject to dangers from loan renewal as well as rising interest rate problems. However, short-term interest rates are generally lower than long-term rates, and some firms are willing to gamble by using a large amount of low-cost, short-term debt in hopes of earning higher profits.

A possible reason for adopting the aggressive policy is to take advantage of an upward sloping yield curve, for which short-term rates are lower than long-term rates. However, as many firms learned during the financial crisis of 2009, a strategy of financing long-term assets with short-term debt is really quite risky. As an illustration, suppose a company borrowed \$1 million on a 1-year basis and used the funds to buy machinery that would lower labor costs by \$200,000 per year for 10 years.<sup>2</sup> Cash flows from the equipment would not be sufficient to pay off the loan at the end of only one year, so the loan would have to be renewed. If the economy were in a recession like that of 2009, the lender might refuse to renew the loan, and that could lead to bankruptcy. Had the firm matched maturities and financed the equipment with a 10-year loan, then the annual loan payments would have been lower and better matched with the cash flows, and the loan renewal problem would not have arisen.

<sup>2</sup>We are oversimplifying here. Few lenders would explicitly lend money for one year to finance a 10-year asset. What would actually happen is that the firm would borrow on a 1-year basis for “general corporate purposes” and then actually use the money to purchase the 10-year machinery.

**FIGURE 16-2** Alternative Current Operating Assets Financing Policies



Under some circumstances even maturity matching can be risky, as many firms that thought they were conservatively financed learned in 2009. If a firm borrowed on a 30-day bank loan to finance inventories that it expected to sell within 30 days but then sales dropped, as they did for many firms in 2009, the funds needed to pay off the maturing bank loan might not be available. Then the bank might not extend the loan, and if it did not then the firm could be forced into bankruptcy. This happened to many firms in 2009, and it was exacerbated by the banks' own problems. The banks had lost billions on mortgages, mortgage-backed bonds, and other bad investments, which led banks to restrict credit to their normal business customers in order to conserve their own cash.

## Conservative Approach

Panel c of the figure shows the dashed line *above* the line designating permanent current assets, indicating that long-term capital is used to finance all permanent assets and also to meet some seasonal needs. In this situation, the firm uses a small amount of short-term credit to meet its peak requirements, but it also meets a part of its seasonal needs by “storing liquidity” in the form of marketable securities. The humps above the dashed line represent short-term financings, while the troughs below the dashed line represent short-term security holdings. This conservative financing policy is fairly safe, and the wisdom of using it was demonstrated in 2009: when credit dried up, firms with adequate cash holdings were able to operate more effectively than those that were forced to cut back their operations because they couldn't order new inventories or pay their normal workforce.

## Choosing among the Approaches

Because the yield curve is normally upward sloping, *the cost of short-term debt is generally lower than that of long-term debt*. However, *short-term debt is riskier to the borrowing firm* for two reasons: (1) If a firm borrows on a long-term basis then its interest costs will be relatively stable over time, but if it uses short-term credit then its interest expense can fluctuate widely—perhaps reaching such high levels that profits are extinguished.<sup>3</sup> (2) If a firm borrows heavily on a short-term basis, then a temporary recession may adversely affect its financial ratios and render it unable to repay its debt. Recognizing this fact, the lender may not renew the loan if the borrower's financial position is weak, which could force the borrower into bankruptcy.

Note also that *short-term loans can generally be negotiated much faster* than long-term loans. Lenders need to make a thorough financial examination before extending long-term credit, and the loan agreement must be spelled out in great detail because a lot can happen during the life of a 10- to 20-year loan.

Finally, *short-term debt generally offers greater flexibility*. If the firm thinks that interest rates are abnormally high and due for a decline, it may prefer short-term credit because prepayment penalties are often attached to long-term debt. Also, if its needs for funds are seasonal or cyclical, then the firm may not want to commit itself to long-term debt because of its underwriting costs and possible prepayment penalties. Finally, long-term loan agreements generally contain provisions, or *covenants*, that constrain the firm's future actions in order to protect the lender, whereas short-term credit agreements generally have fewer restrictions.

<sup>3</sup>The prime interest rate—the rate banks charge very good customers—hit 21% in the early 1980s. This produced a level of business bankruptcies that was not seen again until 2009. The primary reason for the very high interest rate was that the inflation rate was up to 13%, and high inflation must be compensated by high interest rates. Also, the Federal Reserve was tightening credit in order to hold down inflation, and it was encouraging banks to restrict their lending.

All things considered, it is not possible to state that either long-term or short-term financing is generally better. The firm's specific conditions will affect its decision, as will the risk preferences of managers. Optimistic and/or aggressive managers will lean more toward short-term credit to gain an interest cost advantage, whereas more conservative managers will lean toward long-term financing to avoid potential renewal problems. The factors discussed here should be considered, but the final decision will reflect managers' personal preferences and subjective judgments.

#### Self-Test

Differentiate between permanent current operating assets and temporary current operating assets.

What does maturity matching mean, and what is the logic behind this policy?

What are some advantages and disadvantages of short-term versus long-term debt?

## 16.3 THE CASH CONVERSION CYCLE

All firms follow a “working capital cycle” in which they purchase or produce inventory, hold it for a time, and then sell it and receive cash. This process is known as the **cash conversion cycle (CCC)**.

### Calculating the Target CCC

Assume that Great Basin Medical Equipment (GBM) is just starting in business, buying orthopedic devices from a manufacturer in China and selling them through distributors in the United States, Canada, and Mexico. Its business plan calls for it to purchase \$10,000,000 of merchandise at the start of each month and have it sold within 50 days. The company will have 40 days to pay its suppliers, and it will give its customers 60 days to pay for their purchases. GBM expects to just break even during its first few years and so its monthly sales will be \$10,000,000, the same as its purchases (or cost of goods sold). For simplicity, assume that there are no administrative costs. Also, any funds required to support operations will be obtained from the bank, and those loans must be repaid as soon as cash becomes available.

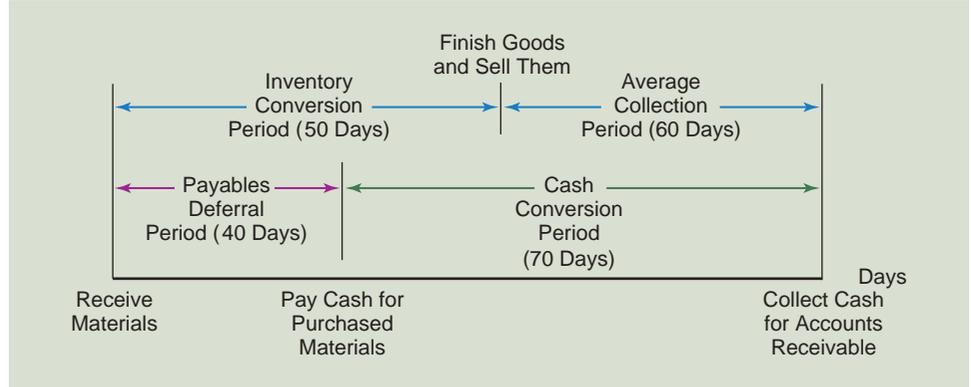
This information can be used to calculate GBM's target, or theoretical, cash conversion cycle, which “nets out” the three time periods described below.<sup>4</sup>

1. **Inventory conversion period.** For GBM, this is the 50 days it expects to take to sell the equipment, converting it from equipment to accounts receivable.<sup>5</sup>
2. **Average collection period (ACP).** This is the length of time customers are given to pay for goods following a sale. The ACP is also called the *days sales outstanding* (DSO). GBM's business plan calls for an ACP of 60 days based on its 60-day credit terms. This is also called the *receivables conversion period*, as it is supposed to take 60 days to collect and thus convert receivables to cash.
3. **Payables deferral period.** This is the length of time GBM's suppliers give it to pay for its purchases, which in our example is 40 days.

On Day 1, GBM expects to buy merchandise, and it expects to sell the goods and thus convert them to accounts receivable within 50 days. It should then take 60 days to collect the receivables, making a total of 110 days between receiving merchandise and collecting cash. However, GBM is able to defer its own payments for only 40 days.

<sup>4</sup>See Verlyn D. Richards and Eugene J. Laughlin, “A Cash Conversion Cycle Approach to Liquidity Analysis,” *Financial Management*, Spring 1980, pp. 32–38.

<sup>5</sup>If GBM were a manufacturer, the inventory conversion period would be the time required to convert raw materials into finished goods and then to sell those goods.

**FIGURE 16-3** The Cash Conversion Cycle

We can combine these three periods to find the theoretical, or target, cash conversion cycle, shown below as an equation and diagrammed in Figure 16-3.

Inventory conversion period	+	Average collection period	-	Payables deferral period	=	Cash conversion cycle	<b>(16-1)</b>
50	+	60	-	40	=	70 days	

Although GBM is supposed to pay its suppliers \$10,000,000 after 40 days, it does not expect to receive any cash until  $50 + 60 = 110$  days into the cycle. Therefore, it will have to borrow the \$10,000,000 cost of the merchandise from its bank on Day 40, and it does not expect to be able to repay the loan until it collects on Day 110. Thus, for  $110 - 40 = 70$  days—which is the theoretical cash conversion cycle (CCC)—it will owe the bank \$10,000,000 and it will be paying interest on this debt. The shorter the cash conversion cycle the better, because a shorter CCC means lower interest charges.

Observe that if GBM could sell goods faster, collect receivables faster, or defer its payables longer without hurting sales or increasing operating costs, then its CCC would decline, its expected interest charges would be reduced, and its expected profits and stock price would be improved.

## Calculating the Actual CCC from Financial Statements

So far we have illustrated the CCC from a theoretical standpoint. However, in practice we would generally calculate the CCC based on the firm's financial statements, and the actual CCC would almost certainly differ from the theoretical value because of real-world complexities such as shipping delays, sales slowdowns, and slow-paying customers. Moreover, a firm such as GBM would be continually starting new cycles before the earlier ones ended, and this too would muddy the waters.

To see how the CCC is calculated in practice, assume that GBM has been in business for several years and is in a stable position, placing orders, making sales, receiving payments, and making its own payments on a recurring basis. The following data were taken from its latest financial statements, in millions:

Annual sales	\$1,216.7
Cost of goods sold	1,013.9
Inventories	140.0
Accounts receivable	445.0
Accounts payable	115.0

Thus, its net operating working capital due to inventory, receivables, and payables is  $\$140 + \$445 - \$115 = \$470$  million, and that amount must be financed—in GBM's case, through bank loans at a 10% interest rate. Therefore, its interest expense is \$47 million per year.

We can analyze the situation more closely. First, consider the inventory conversion period:<sup>6</sup>

$$\begin{aligned} \text{Inventory conversion period} &= \frac{\text{Inventory}}{\text{Cost of goods sold per day}} && (16-2) \\ &= \frac{\$140.0}{\$1,013.9/365} = 50.4 \text{ days} \end{aligned}$$

Thus, it takes GBM an average of 50.4 days to sell its merchandise, which is very close to the 50 days called for in the business plan. Note also that inventory is carried at cost, which explains why the denominator in Equation 16-2 is the cost of goods sold per day, not daily sales.

The average collection period (or days sales outstanding) is calculated next:

$$\begin{aligned} \text{Average collection period} = \text{ACP (or DSO)} &= \frac{\text{Receivables}}{\text{Sales}/365} && (16-3) \\ &= \frac{\$445.0}{\$1,216.7/365} = 133.5 \text{ days} \end{aligned}$$

Thus, it takes GBM 133.5 days after a sale to receive cash, not the 60 days called for in its business plan. Because receivables are recorded at the sales price, we use daily sales (rather than the cost of goods sold per day) in the denominator for the ACP.

The payables deferral period is found as follows, again using daily cost of goods sold in the denominator because payables are recorded at cost:

$$\begin{aligned} \text{Payables deferral period} &= \frac{\text{Payables}}{\text{Purchases per day}} = \frac{\text{Payables}}{\text{Cost of goods sold}/365} && (16-4) \\ &= \frac{\$115.0}{\$1,013.9/365} = 41.4 \text{ days} \end{aligned}$$

<sup>6</sup>In past editions of this book we divided inventories by daily sales to be consistent with many reported data sources. We believe that dividing by daily cost of goods sold provides a more meaningful cash conversion period, so we changed the formula in this edition.

GBM is supposed to pay its suppliers after 40 days, but it actually pays on average just after Day 41. This slight delay is normal, since mail delays and time for checks to be cashed generally slow payments down a bit.

We can now combine the three periods to calculate GBM's actual cash conversion cycle:

$$\text{Cash conversion cycle(ACC)} = 50.4 \text{ days} + 133.5 \text{ days} - 41.4 \text{ days} = 142.5 \text{ days}$$

Figure 16-4 summarizes all of these calculations and then analyzes why the actual CCC exceeds the theoretical CCC by such a large amount. It is clear from the figure that the firm's inventory control is working as expected in that sales match the inflow of new inventory items quite well. Also, its own payments match reasonably well the terms under which it buys. However, its accounts receivable are much higher than they should be, indicating that its customers are not paying on time. In fact, they



**FIGURE 16-4** Summary of the Cash Conversion Cycle (Millions of Dollars)

	A	B	C	D	E	F	G
9	<u>Panel a. Target CCC: Based on Planned Conditions</u>						
10	Cash Conversion Cycle (CCC)	=	Planned Inventory Conversion Period (ICP)	+	Credit Terms Offered to Our Customers	-	Credit Terms Our Supplier Offers Us
11		=	50.0	+	60.0	-	40.0
12							
13	Target CCC	=	70.0				
14							
15	<u>Panel b. Actual CCC: Based on Financial Statements</u>						
16							
17	Sales		\$1,216.7				
18	COGS		\$1,013.9				
19	Inventories		\$140.0				
20	Receivables		\$445.0				
21	Payables		\$115.0				
22	Days/year		365				
23	Actual CCC	=	Inventory ÷ COGS/365	+	Receivables ÷ Sales/365	-	Payables ÷ COGS/365
24		=	\$140 ÷ (\$1,013.9/365)	+	\$445 ÷ (\$1,216.7/365)	-	\$115 ÷ (\$1,013.9/365)
25		=	50.4	+	133.5	-	41.4
26							
27	Actual CCC	=	142.5				
28							
29	<u>Panel c. Actual versus Target components</u>						
30			ICP		ACP		PDP
31	Actual - Target	=	50.4 - 50.0		133.5 - 60.0		41.4 - 40.0
32		=	0.4	+	73.5	-	1.4
33	% Difference	=	0.8%		122.5%		3.5%
34			OK		VERY BAD		OK

Note: GBM's inventories are in line with its plans, and it's paying its suppliers nearly on time. However, some of its customers are paying quite late, so its average collection period (or DSO) is 133.5 days even though all customers are supposed to pay by Day 60.

are paying 73.5 days late, which is increasing GBM's working capital. Because working capital must be financed, the collections delay is lowering the firm's profits and presumably hurting its stock price.

When the CFO reviewed the situation, she discovered that GBM's customers—doctors, hospitals, and clinics—were themselves reimbursed by insurance companies and government units, and those organizations were paying late. The credit manager was doing everything he could to collect faster, but the customers said that they just could not make their own payments until they themselves were paid. If GBM wanted to keep making sales, it seemed that it would have to accept late-paying customers. However, the CFO wondered if collections might come in faster if GBM offered substantial discounts for early payments. We will take up this issue later in the chapter.

### Benefits of Reducing the CCC

As we have seen, GBM currently has a CCC of 142.5 days, which results in \$470 million being tied up in net operating working capital. Assuming that its cost of debt to carry working capital is 10%, this means that the firm is incurring interest charges of \$47 million per year to carry its working capital. Now suppose the company can speed up its sales enough to reduce the inventory conversion period from 50.4 to 35.0 days. In addition, it begins to offer discounts for early payment and thereby reduces its average collection period to 40 days. Finally, assume that it could negotiate a change in its own payment terms from 40 to 50 days. The “New” column of Figure 16-5 shows the net effects of these improvements: a 117.5-day reduction in the cash conversion cycle and a reduction in net operating working capital from \$470.0 to \$91.7 million, which saves \$37.8 million of interest.

Recall also that free cash flow (FCF) is equal to NOPAT minus the net new investment in operating capital. Therefore, if working capital *decreases* by a given amount while other things remain constant, then FCF *increases* by that same amount—\$378.3 million in the GBM example. If sales remained constant in the fol-

**FIGURE 16-5** Benefits from Reducing the Cash Conversion Cycle (Millions of Dollars)

	A	B	C	D	E	F	G
					Old (Actual)		New (Target)
44					50.4		35.0
45	Inventory conversion period (ICP, days)				133.5		40.0
46	Average collection period (ACP, days)				-41.4		-50.0
47	Payable deferral period (PDP, days)				142.5		25.0
48	Cash Collection Cycle (CCC, days)						
49							
50	Reduction in CCC					117.5	
51							
52	Effects of the CCC Reduction						
53	Annual sales				\$1,216.7		\$1,216.7
54	Costs of goods sold (COGS)				\$1,013.9		\$1,013.9
55	Inventory = Actual Old, New = new ICP(COGS/365)				\$140.0		\$97.2
56	Receivables = Actual Old, New = new ACP(Sales/365)				445.0		133.3
57	Payables = Actual Old, New = new PDP(COGS/365)				-115.0		-138.9
58	Net operating WC = Inv + Receivables – Payables				\$470.0		\$91.7
59							
60	Reduction in NOWC					\$378.3	
61	Reduction in interest expense @ 10%					\$37.8	

## Some Firms Operate with Negative Working Capital!

Some firms are able to operate with zero or even negative net working capital. Dell Computer and Amazon.com are examples. When customers order computers from Dell's Web site or books from Amazon, they must provide a credit card number. Dell and Amazon then receive next-day cash, even before the product is shipped and even before they have paid their own suppliers. This results in a negative CCC, which means that working capital *provides* cash rather than using it.

In order to grow, companies normally need cash for working capital. However, if the CCC is negative then growth in sales *provides* cash rather than *uses* it. This cash can be invested in plant and equipment, research and development, or for any other corporate purpose. Analysts recognize this point when they value Dell and Amazon, and it certainly helps their stock prices.

lowing years, then this reduction in working capital would simply be a one-time cash inflow. However, suppose sales grow in future years. When a company improves its working capital management, the components (inventory conversion period, collection period, and payments period) usually remain at their improved levels, which means the NOWC/Sales ratio remains at its new level. With an improved NOWC/Sales ratio, less working capital will be required to support future sales, leading to higher annual FCFs than would have otherwise existed.

Thus, an improvement in working capital management creates a large one-time increase in FCF at the time of the improvement as well as higher FCF in future years. Therefore, an improvement in working capital management is a gift that keeps on giving.

These benefits can add substantial value to the company. Professors Hyun-Han Shin and Luc Soenen studied more than 2,900 companies over a 20-year period, finding a strong relationship between a company's cash conversion cycle and its stock performance.<sup>7</sup> For an average company, a 10-day improvement in its CCC was associated with an increase in pre-tax operating profit margin from 12.76% to 13.02%. Moreover, companies with cash conversion cycles 10 days shorter than the average for their industry had annual stock returns that were 1.7 percentage points higher than the average company. Given results like these, it's no wonder firms place so much emphasis on working capital management!<sup>8</sup>

### Self-Test

Define the following terms: inventory conversion period, average collection period, and payables deferral period. Give the equation for each term.

What is the cash conversion cycle? What is its equation?

What should a firm's goal be regarding the cash conversion cycle, holding other things constant? Explain your answer.

What are some actions a firm can take to shorten its cash conversion cycle?

A company has \$20 million of inventory, \$5 million of receivables, and \$4 million of payables. Its annual sales revenue is \$80 million, and its cost of goods sold is \$60 million. What is its CCC? (120.15)

<sup>7</sup>Hyun-Han Shin and Luc Soenen, "Efficiency of Working Capital Management and Corporate Profitability," *Financial Practice and Education*, Fall/Winter 1998, pp. 37–45.

<sup>8</sup>For more on the CCC, see James A. Gentry, R. Vaidyanathan, and Hei Wai Lee, "A Weighted Cash Conversion Cycle," *Financial Management*, Spring 1990, pp. 90–99.

## 16.4 THE CASH BUDGET

Firms must forecast their cash flows. If they are likely to need additional cash then they should line up funds well in advance, yet if they are likely to generate surplus cash then they should plan for its productive use. The primary forecasting tool is the cash budget, illustrated in Figure 16-6, which is a printout from the chapter's *Excel Tool Kit* model. The illustrative company is Educational Products Corporation (EPC), which supplies educational materials to schools and retailers in the Midwest. Sales are cyclical, peaking in September and then declining for the balance of the year.



**FIGURE 16-6** EPC's Cash Budget, July–December 2011 (Millions of Dollars)

	A	B	C	D	E	F	G	H	I	J	K	L	M
73	<b>Base Case</b>					May	June	July	August	Sept	Oct	Nov	Dec
74	<i>Forecasted gross sales (manual inputs):</i>					\$200.0	\$250.0	\$300.0	\$400.0	\$500.0	\$350.0	\$250.0	\$200.0
75	Adjustment: % deviation from forecast					0%	0%	0%	0%	0%	0%	0%	0%
76	Adjusted gross sales forecast					\$200.0	\$250.0	\$300.0	\$400.0	\$500.0	\$350.0	\$250.0	\$200.0
77													
78	<i>Collections on sales:</i>												
79	During sales' month:		0.2 (Sales)(1 – discount %)			\$58.8	\$78.4	\$98.0	\$68.6	\$49.0	\$39.2		
80	During 2nd month:		0.7(prior month's sales)			175.0	210.0	280.0	350.0	245.0	175.0		
81	Due in 3rd month:		0.1(sales 2 months ago)			20.0	25.0	30.0	40.0	50.0	35.0		
82	Less bad debts (BD% × Sales 2 months ago)					0.0	0.0	0.0	0.0	0.0	0.0		
83	Total collections					\$253.8	\$313.4	\$408.0	\$458.6	\$344.0	\$249.2		
84													
85	<i>Purchases: 60% of next month's sales</i>					\$180.0	\$240.0	\$300.0	\$210.0	\$150.0	\$120.0		
86	<i>Payments</i>												
87	Pmt for last month's purchases (30 days of credit)					\$180.0	\$240.0	\$300.0	\$210.0	\$150.0	\$120.0		
88	Wages and salaries					30.0	40.0	50.0	40.0	30.0	30.0		
89	Lease payments					30.0	30.0	30.0	30.0	30.0	30.0		
90	Other payments (interest on LT bonds, dividends, etc.)					30.0	30.0	30.0	30.0	30.0	30.0		
91	Taxes								30.0		30.0		
92	Payment for plant construction								150.0				
93	Total payments					\$270.0	\$340.0	\$590.0	\$310.0	\$240.0	\$240.0		
94													
95	<i>Net cash flows:</i>												
96	Assumed excess cash on hand at start of forecast period					\$0.0							
97	Net cash flow (NCF): Total collections – Total pmts					–16.2	–26.6	–182.0	148.6	104.0	9.2		
98	Cumulative NCF: Prior month cum plus this month's NCF					–16.2	–42.8	–224.8	–76.2	\$27.8	\$37.0		
99													
100	<i>Cash surplus (or loan requirement)</i>												
101	Target cash balance					\$10.0	\$10.0	\$10.0	\$10.0	\$10.0	\$10.0		
102	Surplus cash or loan needed: Cum NCF – Target cash					–\$26.2	–\$52.8	–\$234.8	–\$86.2	\$17.8	\$27.0		
103													
104	Max required loan (most negative on Row 102)					\$234.8							
105	Max investable funds (most positive on Row 102)					\$27.0							

### Notes:

- Although the budget period is July through December, sales and purchases data for May and June are needed to determine collections and payments during July and August.
- Firms can both borrow and pay off commercial loans on a daily basis, so the \$26.2 million loan needed for July would likely be gradually borrowed as needed on a daily basis, and during October the \$234.8 million loan that presumably existed at the beginning of the month would be reduced daily to the \$86.2 million ending balance—which in turn, would be completely paid off sometime during November.
- The data in the figure are for EPC's base-case forecast. Data for alternative scenarios are shown in the chapter's *Excel Tool Kit* model.

## Monthly Cash Budgets

Cash budgets can be of any length, but EPC and most companies use a monthly cash budget such as the one in Figure 16-6, but set up for 12 months. We used only 6 months for the purpose of illustration. The monthly budget is used for longer-range planning, but a daily cash budget is also prepared at the start of each month to provide a more precise picture of the daily cash flows for use in scheduling actual payments on a day-by-day basis.

The cash budget focuses on cash flows, but it also includes information on forecasted sales, credit policy, and inventory management. Since the statement is a forecast and not a report on historical results, actual results could vary from the figures given. Therefore, the cash budget is generally set up as an expected, or base-case, forecast, but it is created with a model that makes it easy to generate alternative forecasts to see what would happen under different conditions.

Figure 16-6 begins with a forecast of sales for each month on Row 74. Then, on Row 75, it shows possible percentage deviations from the forecasted sales. Since we are showing the base-case forecast, no adjustments are made, but the model is set up to show the effects if sales increase or decrease and so result in “adjusted sales” that are above or below the forecasted levels.

The company sells on terms of “2/10, net 60.” This means that a 2% discount is given if payment is made within 10 days; otherwise, the full amount is due in 60 days. However, like most companies, EPC finds that some customers pay late. Experience shows that 20% of customers pay during the month of the sale and take the discount. Another 70% pay during the month immediately following the sale, and 10% are late, paying in the second month after the sale.<sup>9</sup>

The statement (Line 85) next shows forecasted materials purchases, which equal 60% of the following month’s sales. EPC buys on terms of net 30, meaning that it receives no discounts and is required to pay for its purchases within 30 days of the purchase date. The purchases information is followed by forecasted payments for materials, labor, leases, other payments such as dividends and interest on long-term bonds, taxes (due in September and December), and a payment of \$150 million in September for a new plant that is being constructed.

When the total forecasted payments are subtracted from the forecasted collections, the result is the expected net cash gain or loss for each month. This gain or loss is added to or subtracted from the excess cash on hand at the start of the forecast (which we assume was zero), and the result—the *cumulative net cash flow*—is the amount of cash the firm would have on hand at the end of the month if it neither borrowed nor invested.

EPC’s target cash balance is \$10 million, and it plans either to borrow to meet this target or to invest surplus funds if it generates more cash than it needs. How the target cash balance is determined is discussed later in the chapter, but EPC believes that it needs \$10 million.

By subtracting the target cash balance from the cumulative cash flow, we calculate the *loan needed or surplus cash*, as shown on Row 102. A negative number indicates that we need a loan, whereas a positive number indicates that we forecast surplus cash that is available for investment or other uses.

<sup>9</sup>A negligible percentage of sales results in bad debts. The low bad-debt losses evident here result from EPC’s careful screening of customers and its generally tight credit policies. However, the cash budget model is able to show the effects of bad debts, so EPC’s CFO could show top management how cash flows would be affected if the firm relaxed its credit policy in order to stimulate sales or if the recession worsened and more customers were forced to delay payments.

If we total the net cash flows on Row 97 then the sum is \$37 million, the cumulative NCF as shown in Cell M98. Because this number is positive, it indicates that EPC's cash flow is positive. Also, note that EPC borrows on a basis that allows it to borrow or repay loans on a daily basis. Thus, it would borrow a total of \$26.2 million in July, increasing the loan daily, and would continue to build up the loan through September. Then, when its cash flows turn positive in October, it would start repaying the loan on a daily basis and completely pay it off sometime in November, assuming that everything works out as forecasted.

Note that our cash budget is incomplete in that it shows neither interest paid on the working capital loans nor interest earned on the positive cash balances. These amounts could be added to the budget simply by adding rows and including them. Similarly, if the firm makes quarterly dividend payments, principal payments on its long-term bonds, or any other payments, or if it has investment income, then those cash flows also could be added to the statement. In our simplified statement, we just lumped all such payments into "other payments."

Under the base-case forecast, the CFO will need to arrange a line of credit so that the firm can borrow up to \$234.8 million, increasing the loan over time as funds are needed and repaying it later when cash flows become positive. The treasurer would show the cash budget to the bankers when negotiating for the line of credit. Lenders would want to know how much the firm expects to need, when the funds will be needed, and when the loan will be repaid. The lenders—and EPC's top executives—would question the treasurer about the budget, and they would want to know how the forecasts would be affected if sales were higher or lower than those projected, how changes in customers' payment times would affect the forecasts, and the like. The focus would be on these two questions: *How accurate is the forecast likely to be? What would be the effects of significant errors?* The first question could best be answered by examining historical forecasts, and the second by running different scenarios as we do in the *Excel Tool Kit* model.

No matter how hard we try, no forecast will ever be exactly correct, and this includes cash budgets. You can imagine the bank's reaction if the company negotiated a loan of \$235 million and then came back a few months later saying that it had underestimated its requirements and needed to boost the loan to say \$260 million. The banker might well refuse, thinking the company was not very well managed. Therefore, EPC's treasurer would undoubtedly want to build a cushion into the line of credit—say, a maximum commitment of \$260 million rather than the forecasted requirement of \$234.8 million. However, as we discuss later in the chapter, banks charge commitment fees for guaranteed lines of credit; thus, the higher the cushion built into the line of credit, the more costly the credit will be. This is another reason why it is important to develop accurate forecasts.

## Cash Budgets versus Income Statements and Free Cash Flows

If you look at the cash budget, it looks similar to an income statement. However, the two statements are quite different. Here are some key differences: (1) In an income statement, the focus would be on sales, not collections. (2) An income statement would show accrued taxes, wages, and so forth, not the actual payments. (3) An income statement would show depreciation as an expense, but it would not show expenditures on new fixed assets. (4) An income statement would show a cost for goods purchased when those goods were sold, not for when they were ordered or paid.

These are obviously large differences, so it would be a big mistake to confuse a cash budget with an income statement. Also, the cash flows shown on the cash budget are



different from the firm's free cash flows, because FCF reflects after-tax operating income and the investments required to maintain future operations whereas the cash budget reflects only the actual cash inflows and outflows during a particular period.

The bottom line is that cash budgets, income statements, and free cash flows are all important and are related to one another, but they are also quite different. Each is designed for a specific purpose, and the main purpose of the cash budget is to forecast the firm's liquidity position, not its profitability.

## Daily Cash Budgets

Note that if cash inflows and outflows do not occur uniformly during each month, then the actual funds needed might be quite different from the indicated amounts. The data in Figure 16-6 show the situation on the last day of each month, and we see that the maximum projected loan during the forecast period is \$234.8 million. Yet if all payments had to be made on the 1st of the month but most collections came on the 30th, then EPC would have to make \$270 million of payments in July before it received the \$253.8 million from collections. In that case, the firm would need to borrow about \$270 million in July, not the \$26.2 million shown in Figure 16-6. This would make the bank unhappy—perhaps so unhappy that it would not extend the requested credit. A daily cash budget would have revealed this situation.

Figure 16-6 was prepared using *Excel*, which makes it easy to change the assumptions. In the *Tool Kit* model we examine the cash flow effects of changes in sales, in customers' payment patterns, and so forth. Also, the effects of changes in credit policy and inventory management could be examined through the cash budget.

How could the cash budget be used when negotiating the terms of a bank loan?  
 How would a shift from a tight credit policy to a relaxed policy be likely to affect a firm's cash budget?  
 How would the cash budget be affected if our firm's suppliers offered us terms of "2/10, net 30," rather than "net 30," and we decided to take the discount?  
 Suppose a firm's cash flows do not occur uniformly throughout the month.  
 What effect would this have on the accuracy of the forecasted borrowing requirements based on a monthly cash budget? How could the firm deal with this problem?

## 16.5 CASH MANAGEMENT AND THE TARGET CASH BALANCE

Cash is needed to pay for labor and raw materials, to purchase fixed assets, to pay taxes, to service debt, to pay dividends, and so on, but cash itself (and the money in most commercial checking accounts) earns no interest. Thus, the goal of the cash manager is to minimize the cash amount the firm must hold for conducting its normal business activities while continuing to maintain a sufficient cash reserve to (1) take trade discounts, (2) pay promptly and thus maintain its credit rating, and (3) meet any unexpected cash needs. We begin our analysis with a discussion of the traditional reasons for holding cash.

### Reasons for Holding Cash

Firms hold cash for two primary reasons:

1. *Transactions, both routine and precautionary.* Cash balances are necessary in business operations. Payments must be made in cash, and receipts are



#### Self-Test

## The CFO Cash Management Scorecard

Each year *CFO Magazine* publishes a cash management scorecard, prepared by REL Consultancy Group, based on the 1,000 largest publicly traded U.S. companies. On the one hand, if a company holds more cash than needed to support its operations, its return on invested capital (ROIC) will be dragged down because cash earns a low rate of return. On the other hand, if a company doesn't have enough cash, then it might experience financial distress if there is an unexpected downturn in business. How much cash is enough?

Although the optimum level of cash depends on a company's unique set of circumstances, REL defines industry benchmarks as that quartile of firms in an industry that have the lowest cash/sales ratios—on the theory that these firms have the best cash management procedures. A recent average benchmark cash/sales ratio was 5.6%, whereas the average firm had a ratio of

10.4%. This suggests that many firms had a lot more cash than they actually needed.

It's one thing to talk about reducing cash, but how can a company do it? A good relationship with its banks is one key to keeping low cash levels. Jim Hopwood, treasurer of Wickes, says, "We have a credit revolver if we ever need it." The same is true at Havertys Furniture, where CFO Dennis Fink says that if you have solid bank commitments, "You don't have to worry about predicting short-term fluctuations in cash flow."

*Sources:* Randy Myers, "Tight Makes Right," *CFO*, December 2008, pp. 64–70; D. M. Katz, "Cash Scorecard: Unleash the Hoards," *CFO.com*, October 17, 2006, <http://www.cfo.com/article.cfm/8048654?f=search>; Randy Myers, "Stuck on Yellow," *CFO*, October 2005, pp. 81–90; and S. L. Mintz, "Lean Green Machine," *CFO*, July 2000, pp. 76–94. For updates, go to <http://www.cfo.com> and search for "cash management."

deposited in the cash account. Cash balances associated with routine payments and collections are known as **transactions balances**. Cash inflows and outflows are unpredictable, and the degree of predictability varies among firms and industries. Therefore, firms need to hold some cash to meet random, unforeseen fluctuations in inflows and outflows. These "safety stocks" are called **precautionary balances**, and the less predictable the firm's cash flows, the larger such balances should be.

2. *Compensation to banks for providing loans and services.* A bank makes money by lending out funds that have been deposited with it, so the larger its deposits, the better the bank's profit position. If a bank is providing services to a customer then it may require that customer to leave a minimum balance on deposit to help offset the costs of providing those services. Also, banks may require borrowers to hold their transactions deposits at the bank. Both types of deposits are called **compensating balances**. In a 1979 survey, 84.7% of responding companies reported they were required to maintain compensating balances to help pay for bank services; only 13.3% reported paying direct fees for banking services.<sup>10</sup> By 1996, those findings were reversed: Only 28% paid for bank services with compensating balances, while 83% paid direct fees.<sup>11</sup> Although the use of compensating balances to pay for services has declined, these balances improve a firm's relationship with its bank and are still a reason why some companies hold additional cash.

In addition to holding cash for transactions, precautionary, and compensating balances, it is essential that the firm have sufficient cash to take **trade discounts**. Sup-

<sup>10</sup>See Lawrence J. Gitman, E. A. Moses, and I. T. White, "An Assessment of Corporate Cash Management Practices," *Financial Management*, Spring 1979, pp. 32–41.

<sup>11</sup>See Charles E. Maxwell, Lawrence J. Gitman, and Stephanie A. M. Smith, "Working Capital Management and Financial-Service Consumption Preferences of US and Foreign Firms: A Comparison of 1979 and 1996 Preferences," *Financial Practice and Education*, Fall/Winter 1998, pp. 46–52.

pliers frequently offer customers discounts for early payment of bills. As we will see later in this chapter, the cost of not taking discounts is sometimes very high, so firms should have enough cash to permit payment of bills in time to take discounts.

Finally, for a number of reasons firms often hold short-term investments in excess of the cash needed to support operations. We discuss short-term investments later in the chapter.

### Self-Test

Why is cash management important?

What are the primary motives for holding cash?

## 16.6 CASH MANAGEMENT TECHNIQUES

In terms of dollar volume, most business is conducted by large firms, many of which operate nationally or globally. They collect cash from many sources and make payments from a number of different cities or even countries. For example, companies such as IBM, General Electric, and Hewlett-Packard have manufacturing plants all around the world, even more sales offices, and bank accounts in virtually every city where they do business. Their collection centers follow sales patterns. However, while some disbursements are made from local offices, most are made in the cities where manufacturing occurs or else from the home office. Thus, a major corporation might have hundreds or even thousands of bank accounts located in cities all over the globe, but there is no reason to think that inflows and outflows will balance in each account. Therefore, a system must be in place to transfer funds from where they come in to where they are needed, to arrange loans to cover net corporate shortfalls, and to invest net corporate surpluses without delay. Some commonly used techniques for accomplishing these tasks are discussed next.<sup>12</sup>

### Synchronizing Cash Flow

If you as an individual were to receive income once a year, then you would probably put it in the bank, draw down your account periodically, and have an average balance for the year equal to about half of your annual income. If instead you received income weekly and paid rent, tuition, and other charges on a daily basis, then your average bank balance would still be about half of your periodic receipts and thus only 1/52 as large as if you received income only once annually.

Exactly the same situation holds for businesses: By timing their cash receipts to coincide with their cash outlays, firms can hold their transactions balances to a minimum. Recognizing this fact, firms such as utilities, oil companies, and credit card companies arrange to bill customers—and to pay their own bills—on regular “billing cycles” throughout the month. This **synchronization of cash flows** provides cash when it is needed and thus enables firms to reduce their average cash balances.

### Speeding Up the Check-Clearing Process

When a customer writes and mails a check, the funds are not available to the receiving firm until the **check-clearing process** has been completed. First, the check must be delivered through the mail. Checks received from customers in distant cities are especially subject to mail delays.

When a customer’s check is written on one bank and a company deposits the check in another bank, the company’s bank must verify that the check is valid before

<sup>12</sup>For more information on cash management, see Bruce J. Summers, “Clearing and Payment Systems: The Role of the Central Bank,” *Federal Reserve Bulletin*, February 1991, pp. 81–91.

the payee can use those funds. Checks are generally cleared through the Federal Reserve System or through a clearinghouse set up by the banks in a particular city.<sup>13</sup> Before 2004, this process sometimes took 2 to 5 days. But with the passage of a federal law in 2004 known as “Check 21,” banks can exchange digital images of checks. This means that most checks now clear in a single day.

## Using Float

*Float* is defined as the difference between the balance shown in a firm’s (or individual’s) checkbook and the balance on the bank’s records. Suppose a firm writes, on average, checks in the amount of \$5,000 each day, and suppose it takes 6 days for these checks to clear and be deducted from the firm’s bank account. This will cause the firm’s own checkbook to show a balance that is \$30,000 smaller than the balance on the bank’s records; this difference is called **disbursement float**. Now suppose the firm also receives checks in the amount of \$5,000 daily but that it loses 4 days while those checks are being deposited and cleared. This will result in \$20,000 of **collections float**. In total, the firm’s **net float**—the difference between the \$30,000 positive disbursement float and the \$20,000 negative collections float—will be \$10,000. In sum, collections float is bad, disbursement float is good, and positive net float is even better.

Delays that cause float will occur because it takes time for checks to (1) travel through the mail (mail float), (2) be processed by the receiving firm (processing float), and (3) clear through the banking system (clearing, or availability, float). Basically, the size of a firm’s net float is a function of its ability to speed up collections on checks it receives and to slow down collections on checks it writes. Efficient firms go to great lengths to speed up the processing of incoming checks, thus putting the funds to work faster, and they try to stretch their own payments out as long as possible, sometimes by disbursing checks from banks in remote locations.

## Speeding Up Collections

Two major techniques are used to speed collections and to get funds where they are needed: lockboxes and electronic transfers.

**Lockboxes.** A **lockbox system** is one of the oldest cash management tools. In a lockbox system, incoming checks are sent to post office boxes rather than to the firm’s corporate headquarters. For example, a firm headquartered in New York City might have its West Coast customers send their payments to a post office box in San Francisco, its customers in the Southwest send their checks to Dallas, and so on, rather than having all checks sent to New York City. Several times a day, a local bank will empty the lockbox and deposit the checks into the company’s local account. The bank then provides the firm with a daily record of the receipts collected, usually via an electronic data transmission system in a format that permits online updating of the firm’s accounts receivable records.

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<sup>13</sup>For example, suppose a check for \$100 is written on Bank A and deposited at Bank B. Bank B will usually contact either the Federal Reserve System or a clearinghouse to which both banks belong. The Fed or the clearinghouse will then verify with Bank A that the check is valid and that the account has sufficient funds to cover the check. Bank A’s account with the Fed or the clearinghouse is then reduced by \$100, and Bank B’s account is increased by \$100. Of course, if the check is deposited in the same bank on which it was drawn, that bank merely transfers funds by bookkeeping entries from one depositor to another.

A lockbox system reduces the time required to receive incoming checks, to deposit them, and to get them cleared through the banking system and available for use. Lockbox services can make funds available as many as 2 to 5 days faster than via the “regular” system.

**Payment by Wire or Automatic Debit.** Firms are increasingly demanding payments of larger bills by wire or by automatic electronic debits. Under an electronic debit system, funds are automatically deducted from one account and added to another. This is, of course, the ultimate in a speeded-up collection process, and computer technology is making such a process increasingly feasible and efficient, even for retail transactions.

### Self-Test

What is float? How do firms use float to increase cash management efficiency?  
What are some methods firms can use to accelerate receipts?

## 16.7 INVENTORY MANAGEMENT

Inventory management techniques are covered in depth in production management courses. Still, financial managers have a responsibility for raising the capital needed to carry inventory and for overseeing the firm’s overall profitability, so it is appropriate that we cover the financial aspects of inventory management here.

The twin goals of inventory management are (1) to ensure that the inventories needed to sustain operations are available, but (2) to hold the costs of ordering and carrying inventories to the lowest possible level. While analyzing improvements in the cash conversion cycle, we identified some of the cash flows associated with a reduction in inventory. In addition to the points made earlier, lower inventory levels reduce costs due to storage and handling, insurance, property taxes, spoilage, and obsolescence.

Before the computer age, companies used such simple inventory control techniques as the “red line” system, where a red line was drawn around the inside of a bin holding inventory items; when the actual stock declined to the level where the red line showed, inventory would be reordered. But now computers have taken over, and supply chains have been established that provide inventory items just before they are needed—the *just-in-time* system. For example, consider Trane Corporation, which makes air conditioners and currently uses just-in-time procedures. In the past, Trane produced parts on a steady basis, stored them as inventory, and had them ready whenever the company received an order for a batch of air conditioners. However, the company’s inventory eventually covered an area equal to three football fields, and it still could take as long as 15 days to fill an order. To make matters worse, occasionally some of the necessary components simply could not be located; in other instances, the components were located but found to have been damaged from long storage.

Then Trane adopted a new inventory policy—it began producing components only after receiving an order and then sending the parts directly from the machines that make them to the final assembly line. The net effect: Inventories fell nearly 40% even as sales were increasing by 30%.

Such improvements in inventory management can free up considerable amounts of cash. For example, suppose a company has sales of \$120 million and an inventory turnover ratio of 3. This means the company has an inventory level of

$$\begin{aligned}\text{Inventory} &= \text{Sales}/(\text{Inventory turnover ratio}) \\ &= \$120/3 = \$40 \text{ million}\end{aligned}$$

If the company can improve its inventory turnover ratio to 4, then its inventory will fall to

$$\text{Inventory} = \$120/4 = \$30 \text{ million}$$

This \$10 million reduction in inventory boosts free cash flow by \$10 million.

## Supply Chain Management

Herman Miller Inc. manufactures a wide variety of office furniture, and a typical order from a single customer might require work at five different plants. Each plant uses components from different suppliers, and each plant works on orders for many customers. Imagine all the coordination that is required. The sales force generates the order, the purchasing department orders components from suppliers, and the suppliers must order materials from their own suppliers. The suppliers make and then ship the components to Herman Miller, the factory builds the products, the different products are gathered together to complete the order, and then the order is shipped to the customer. If one part of that process malfunctions, then the order will be delayed, inventory will pile up, extra costs to expedite the order will be incurred, and the customer's goodwill will be damaged, hurting future growth.

To prevent such consequences, many companies employ supply chain management (SCM). The key element in SCM is sharing information all the way back from the retailer where the product is sold, to the company's own plant, then back to the firm's suppliers, and even back to the suppliers' suppliers. SCM requires special computer software, but even more important is that it requires cooperation among the different companies and departments in the supply chain. This culture

of open communication is often difficult for many companies, which can be reluctant to divulge operating information. For example, EMC Corp., a manufacturer of data storage systems, has become deeply involved in the design processes and financial controls of its key suppliers. Many of EMC's suppliers were initially wary of these new relationships. However, SCM has been a win-win proposition, with higher profits for both EMC and its suppliers.

The same is true at many other companies. After implementing SCM, Herman Miller was able to reduce its days of inventory on hand by a week and to cut 2 weeks off of delivery times to customers. It was also able to operate its plants at a 20% higher volume without additional capital expenditures, because downtime due to inventory shortages was virtually eliminated. As another example, Heineken USA can now get beer from its Dutch breweries to its customers' shelves in less than 6 weeks, compared with 10 to 12 weeks before implementing SCM. As these and other companies have found, SCM increases free cash flows, and that leads to more profits and higher stock prices.

*Sources:* Elaine L. Appleton, "Supply Chain Brain," *CFO*, July 1997, pp. 51–54; and Kris Frieswick, "Up Close and Virtual," *CFO*, April 1998, pp. 87–91.

However, there are costs associated with holding too little inventory, and these costs can be severe. If a business lowers its inventories then it must reorder frequently, which increases ordering costs. Even worse, if stocks become depleted then firms can miss out on profitable sales and also suffer lost goodwill, which may lead to lower future sales. Therefore, it is important to have enough inventory on hand to meet customer demands but not so much as to incur the costs we discussed previously. Inventory optimization models have been developed, but the best approach—and the one most firms today are following—is to use supply chain management and monitor the system closely.<sup>14</sup>

### Self-Test

What are some costs associated with high inventories? With low inventories? What is a "supply chain," and how are supply chains related to just-in-time inventory procedures?

A company has \$20 million in sales and an inventory turnover ratio of 2.0. If it can reduce its inventory and improve its inventory turnover ratio to 2.5 with no loss in sales, by how much will FCF increase? (**\$2 million**)

<sup>14</sup>For additional insights into the problems of inventory management, see Richard A. Followill, Michael Schellenger, and Patrick H. Marchard, "Economic Order Quantities, Volume Discounts, and Wealth Maximization," *The Financial Review*, February 1990, pp. 143–152.

## 16.8 RECEIVABLES MANAGEMENT

Firms would, in general, rather sell for cash than on credit, but competitive pressures force most firms to offer credit for substantial purchases, especially to other businesses. Thus, goods are shipped, inventories are reduced, and an **account receivable** is created.<sup>15</sup> Eventually, the customer will pay the account, at which time (1) the firm will receive cash and (2) its receivables will decline. Carrying receivables has both direct and indirect costs, but selling on credit also has an important benefit: increased sales.

Receivables management begins with the firm's credit policy, but a monitoring system is also important to keep tabs on whether the terms of credit are being observed. Corrective action is often needed, and the only way to know whether the situation is getting out of hand is with a good receivables control system.<sup>16</sup>

### Credit Policy

The success or failure of a business depends primarily on the demand for its products—as a rule, high sales lead to larger profits and a higher stock price. Sales, in turn, depend on a number of factors: some, like the state of the economy, are exogenous, but others are under the firm's control. The major controllable factors are sales prices, product quality, advertising, and the firm's **credit policy**. Credit policy, in turn, consists of the following four variables.

1. *Credit period.* A firm might sell on terms of “net 30,” which means that the customer must pay within 30 days.
2. *Discounts.* If the credit terms are stated as “2/10, net 30,” then buyers may deduct 2% of the purchase price if payment is made within 10 days; otherwise, the full amount must be paid within 30 days. Thus, these terms allow a discount to be taken.
3. *Credit standards.* How much financial strength must a customer show to qualify for credit? Lower credit standards boost sales, but they also increase bad debts.
4. *Collection policy.* How tough or lax is a company in attempting to collect slow-paying accounts? A tough policy may speed up collections, but it might also anger customers and cause them to take their business elsewhere.

The credit manager is responsible for administering the firm's credit policy. However, because of the pervasive importance of credit, the credit policy itself is normally established by the executive committee, which usually consists of the president plus the vice presidents of finance, marketing, and production.

### The Accumulation of Receivables

The total amount of accounts receivable outstanding at any given time is determined by two factors: (1) the credit sales per day and (2) the average length of time it takes to collect cash on accounts receivable:

<sup>15</sup>Whenever goods are sold on credit, two accounts are created—an asset item entitled *accounts receivable* appears on the books of the selling firm, and a liability item called *accounts payable* appears on the books of the purchaser. At this point, we are analyzing the transaction from the viewpoint of the seller, so we are concentrating on the variables under its control (i.e., the receivables). We examine the transaction from the viewpoint of the purchaser later in this chapter, where we discuss accounts payable as a source of funds and consider their cost.

<sup>16</sup>For more on credit policy and receivables management, see Shehzad L. Mian and Clifford W. Smith, “Extending Trade Credit and Financing Receivables,” *Journal of Applied Corporate Finance*, Spring 1994, pp. 75–84; and Paul D. Adams, Steve B. Wyatt, and Yong H. Kim, “A Contingent Claims Analysis of Trade Credit,” *Financial Management*, Autumn 1992, pp. 104–112.

$$\text{Accounts receivable} = \text{Credit sales per day} \times \text{Length of collection period} \quad (16-5)$$

For example, suppose Boston Lumber Company (BLC), a wholesale distributor of lumber products, opens a warehouse on January 1 and, starting the first day, makes sales of \$1,000 each day. For simplicity, we assume that all sales are on credit and that customers are given 10 days to pay. At the end of the first day, accounts receivable will be \$1,000; they will rise to \$2,000 by the end of the second day; and by January 10, they will have risen to  $10(\$1,000) = \$10,000$ . On January 11, another \$1,000 will be added to receivables, but payments for sales made on January 1 will be collected and thus will reduce receivables by \$1,000, so total accounts receivable will remain constant at \$10,000. Once the firm's operations have stabilized, the following situation will exist:

$$\begin{aligned} \text{Accounts receivable} &= \text{Credit sales per day} \times \text{Length of collection period} \\ &= \$1,000 \times 10 \text{ days} = \$10,000 \end{aligned}$$

If either credit sales or the collection period changes, these changes will be reflected in the accounts receivable balance.

## Monitoring the Receivables Position

Both investors and bank loan officers should pay close attention to accounts receivable, because what you see on a financial statement is not necessarily what you end up getting. To see why, consider how the accounting system operates. When a credit sale is made, these events occur: (1) inventories are reduced by the cost of goods sold; (2) accounts receivable are increased by the sales price; and (3) the difference is reported as a profit, which is adjusted for taxes and then added to the previous retained earnings balance. If the sale is for cash, then the cash from the sale has actually been received by the firm and the scenario just described is completely valid. If the sale is on credit, however, then the firm will not receive the cash from the sale unless and until the account is collected. Firms have been known to encourage “sales” to weak customers in order to report high current profits. This could boost the firm's stock price—but only for a short time. Eventually, credit losses will lower earnings, at which time the stock price will fall. This is another example of how differences between a firm's stock price and its intrinsic value can arise, and it is something that security analysts must keep in mind.

An analysis along the lines suggested in the following sections will detect any such questionable practice, and it will also help a firm's management learn of problems that might be arising. Such early detection helps both investors and bankers avoid losses, and it also helps a firm's management maximize intrinsic values.

**Days Sales Outstanding (DSO).** Suppose Super Sets Inc., a television manufacturer, sells 200,000 television sets a year at a price of \$198 each. Assume that all sales are on credit under the terms 2/10, net 30. Finally, assume that 70% of the customers take the discount and pay on Day 10 and that the other 30% pay on Day 30.<sup>17</sup>

<sup>17</sup>Unless otherwise noted, we assume throughout that payments are made either on the *last day* for taking discounts or on the *last day* of the credit period. It would be foolish to pay on (say) the 5th day or on the 20th day if the credit terms were 2/10, net 30.

## Supply Chain Finance

In our global economy, companies purchase parts and materials from suppliers located all over the world. For small and mid-size suppliers, especially those in less developed economies, selling to international customers can lead to cash flow problems. First, many suppliers have no way of knowing when their invoices have been approved by their customers. Second, they have no way of knowing when they will actually receive payment from their customers. With a 4–5-month lag between the time an order is received and the time the payment occurs, many suppliers resort to expensive local financing that can add as much as 4% to their costs. Even worse, some suppliers go out of business, which reduces competition and ultimately leads to higher prices.

Although most companies now work very hard with their suppliers to improve their supply chain operations, which is at the heart of supply management, a recent poll shows that only 13% actively use supply chain finance (SCF) techniques. However, that figure is

likely to rise in the near future. For example, Big Lots joined a Web-based service operated by PrimeRevenue that works like this: First, invoices received by Big Lots are posted to the system as soon as they are approved. The supplier doesn't need specialized software but can check its invoices using a Web browser. Second, the supplier has the option of selling the approved invoices at a discount to financial institutions and banks that have access to the PrimeRevenue network. A further advantage to the supplier is that it receives cash within a day of the invoices' approval. In addition, the effective interest rate built into the discounted price is based on the credit rating of Big Lots, not that of the supplier.

As Big Lots treasurer Jared Poff puts it, this allows vendors to "compete on their ability to make the product and not on their ability to access financing."

Sources: Kate O'Sullivan, "Financing the Chain," *CFO*, February 2007, pp. 46–53.

Super Sets's **days sales outstanding (DSO)**, sometimes called the *average collection period (ACP)*, is 16 days:

$$\text{DSO} = \text{ACP} = 0.7(10 \text{ days}) + 0.3(30 \text{ days}) = 16 \text{ days}$$

Super Sets's *average daily sales (ADS)* is \$108,493:

$$\text{ADS} = \frac{\text{Annual sales}}{365} = \frac{(\text{Units sold})(\text{Sales price})}{365} \quad (16-6)$$

$$= \frac{200,000(\$198)}{365} = \frac{\$39,600,000}{365} = \$108,493$$

Super Sets's accounts receivable—assuming a constant, uniform rate of sales throughout the year—will at any point in time be \$1,735,888:

$$\text{Receivables} = (\text{DSO})(\text{ADS}) \quad (16-7)$$

$$= (\$108,493)(16) = \$1,735,888$$

Note that DSO, or average collection period, is a measure of the average length of time it takes the firm's customers to pay off their credit purchases. Super Sets's DSO is 16 days versus an industry average of 25 days, so either Super Sets has a higher percentage of discount customers or else its credit department is exceptionally good at ensuring prompt payment.

**TABLE 16-1** Aging Schedules

AGE OF ACCOUNT (DAYS)	SUPER SETS		WONDER VISION	
	VALUE OF ACCOUNT	PERCENTAGE OF TOTAL VALUE	VALUE OF ACCOUNT	PERCENTAGE OF TOTAL VALUE
0–10	\$1,215,122	70%	\$ 815,867	47%
11–30	520,766	30	451,331	26
31–45	0	0	260,383	15
46–60	0	0	173,589	10
Over 60	0	0	34,718	2
Total receivables	<u>\$1,735,888</u>	<u>100%</u>	<u>\$1,735,888</u>	<u>100%</u>

Finally, note that you can derive both the annual sales and the receivables balance from the firm's financial statements, so you can calculate DSO as follows:

$$\text{DSO} = \frac{\text{Receivables}}{\text{Sales per day}} = \frac{\$1,735,888}{\$108,493} = 16 \text{ days}$$

The DSO can also be compared with the firm's own credit terms. For example, suppose Super Sets's DSO had been averaging 35 days. With a 35-day DSO, some customers obviously are taking more than 30 days to pay their bills. In fact, if many customers are paying by Day 10 to take advantage of the discount, then the others must be taking, on average, *much* longer than 35 days. A way to check this possibility is to use an aging schedule, as described next.

**Aging Schedules.** An **aging schedule** breaks down a firm's receivables by age of account. Table 16-1 shows the December 31, 2009, aging schedules of two television manufacturers, Super Sets and Wonder Vision. Both firms offer the same credit terms, and they have the same total receivables. Super Sets's aging schedule indicates that all of its customers pay on time: 70% pay by Day 10 and 30% pay by Day 30. In contrast, Wonder Vision's schedule, which is more typical, shows that many of its customers are not paying on time: 27% of its receivables are more than 30 days old, even though Wonder Vision's credit terms call for full payment by Day 30.

Aging schedules cannot be constructed from the type of summary data reported in financial statements; rather, they must be developed from the firm's accounts receivable ledger. However, well-run firms have computerized their accounts receivable records, so it is easy to determine the age of each invoice, to sort electronically by age categories, and thus to generate an aging schedule.

Management should constantly monitor both the DSO and the aging schedule to detect any trends, to see how the firm's collections experience compares with its credit terms, and to see how effectively the credit department is operating in comparison with other firms in the industry. If the DSO starts to lengthen or the aging schedule begins to show an increasing percentage of past-due accounts, then the credit manager should examine why these changes are occurring.

Although increases in the DSO and the aging schedule are warning signs, this does not necessarily indicate the firm's credit policy has weakened. If a firm experiences sharp seasonal variations or if it is growing rapidly, then both the aging

schedule and the DSO may be distorted. To see this point, note that the DSO is calculated as follows:

$$\text{DSO} = \frac{\text{Accounts receivable}}{\text{Annual Sales}/365}$$

Receivables at any point in time reflect sales in the past 1 or 2 months, but sales as shown in the denominator are for the past 12 months. Therefore, a seasonal increase in sales will increase the numerator more than the denominator and hence will raise the DSO, even if customers continue to pay just as quickly as before. Similar problems arise with the aging schedule, because if sales are rising then the percentage in the 0–10-day category will be high, and the reverse will occur if sales are falling. Therefore, a change in either the DSO or the aging schedule should be taken as a signal to investigate further; it is not necessarily a sign that the firm's credit policy has weakened.

### Self-Test

Explain how a new firm's receivables balance is built up over time.

Define days sales outstanding (DSO). What can be learned from it? How is it affected by sales fluctuations?

What is an aging schedule? What can be learned from it? How is it affected by sales fluctuations?

A company has annual sales of \$730 million. If its DSO is 35, what is its average accounts receivables balance? (**\$70 million**).

## 16.9 ACCRUALS AND ACCOUNTS PAYABLE (TRADE CREDIT)

Recall that net operating working capital is equal to operating current assets minus operating current liabilities. The previous sections discussed the management of operating current assets (cash, inventory, and accounts receivable), and the following sections discuss the two major types of operating current liabilities: accruals and accounts payable.<sup>18</sup>

### Accruals

Firms generally pay employees on a weekly, biweekly, or monthly basis, so the balance sheet will typically show some accrued wages. Similarly, the firm's own estimated income taxes, employment and income taxes withheld from employees, and sales taxes collected are generally paid on a weekly, monthly, or quarterly basis. Therefore, the balance sheet will typically show some accrued taxes along with accrued wages.

These **accruals** can be thought of as short-term, interest-free loans from employees and taxing authorities, and they increase automatically (that is, *spontaneously*) as a firm's operations expand. However, a firm cannot ordinarily control its accruals: The timing of wage payments is set by economic forces and industry norms, and tax payment dates are established by law. Thus, firms generally use all the accruals they can, but they have little control over the levels of these accounts.

### Accounts Payable (Trade Credit)

Firms generally make purchases from other firms on credit, recording the debt as an *account payable*. Accounts payable, or **trade credit**, is the largest single operating

<sup>18</sup>For more on accounts payable management, see James A. Gentry and Jesus M. De La Garza, "Monitoring Accounts Payables," *Financial Review*, November 1990, pp. 559–576.

current liability, representing about 40% of the current liabilities for an average non-financial corporation. The percentage is somewhat larger for smaller firms: Because small companies often have difficulty obtaining financing from other sources, they rely especially heavily on trade credit.

Trade credit is a spontaneous source of financing in the sense that it arises from ordinary business transactions. For example, suppose a firm makes average purchases of \$2,000 a day on terms of net 30, meaning that it must pay for goods 30 days after the invoice date. On average, it will owe 30 times \$2,000, or \$60,000, to its suppliers. If its sales, and consequently its purchases, were to double, then its accounts payable would also double, to \$120,000. So simply by growing, the firm would spontaneously generate an additional \$60,000 of financing. Similarly, if the terms under which the firm buys were extended from 30 to 40 days, then its accounts payable would expand from \$60,000 to \$80,000 even with no growth in sales. Thus, both expanding sales and lengthening the credit period generate additional amounts of financing via trade credit.

## The Cost of Trade Credit

Firms that sell on credit have a *credit policy* that includes their *terms of credit*. For example, Microchip Electronics sells on terms of 2/10, net 30: it gives customers a 2% discount if they pay within 10 days of the invoice date, but the full invoice amount is due and payable within 30 days if the discount is not taken.

The “true price” of Microchip’s products is the net price, or 0.98 times the list price, because any customer can purchase an item at that price as long as payment is made within 10 days. Now consider Personal Computer Company (PCC), which buys its memory chips from Microchip. One chip is listed at \$100, so its “true” price to PCC is \$98. Now if PCC wants an additional 20 days of credit beyond the 10-day discount period, it must incur a finance charge of \$2 per chip for that credit. Thus, the \$100 list price consists of two components:

$$\text{List price} = \$98 \text{ true price} + \$2 \text{ finance charge}$$

The question PCC must ask before it turns down the discount to obtain the additional 20 days of credit is this: Could credit be obtained at a lower cost from a bank or some other lender?

Now assume that PCC buys \$11,923,333 of memory chips from Microchip each year at the net, or true, price. This amounts to  $\$11,923,333/365 = \$32,666.67$  per day. For simplicity, assume that Microchip is PCC’s only supplier. If PCC decides not to take the additional 20 days of trade credit—that is, if it pays on the 10th day and takes the discount—then its payables will average  $10(\$32,666.67) = \$326,667$ . Thus, PCC will be receiving \$326,667 of credit from Microchip.

Now suppose PCC decides to take the additional 20 days credit and so must pay the full list price. Since PCC will now pay on the 30th day, its accounts payable will increase to  $30(\$32,666.67) = \$980,000$ .<sup>19</sup> Microchip will now be supplying PCC with an additional  $\$980,000 - \$326,667 = \$653,333$  of credit, which PCC could use to build up its cash account, to pay off debt, to expand inventories, or even to extend credit to its own customers, hence increasing its own accounts receivable.

<sup>19</sup>A question arises here: Should accounts payable reflect gross purchases or purchases net of discounts? Generally accepted accounting principles permit either treatment if the difference is not material, but if the discount is material then the transaction must be recorded net of discounts, or at “true” prices. Then, the higher payment that results from not taking discounts is reported as an expense called “discounts lost.” Therefore, *we show accounts payable net of discounts even if the company does not expect to take discounts.*

Thus the additional trade credit offered by Microchip has a cost: PCC must pay a finance charge equal to the 2% discount it is forgoing. PCC buys \$11,923,333 of chips at the true price, so the added finance charge would increase the total cost to  $\$11,923,333/0.98 = \$12,166,666$ . Therefore, the annual financing cost is  $\$12,166,666 - \$11,923,333 = \$243,333$ . Dividing the \$243,333 financing cost by the \$653,333 of additional credit, we calculate the nominal annual cost rate of the additional trade credit to be 37.2%:

$$\text{Nominal annual costs} = \frac{\$243,333}{\$653,333} = 37.2\%$$

If PCC can borrow from its bank (or some other source) at an interest rate less than 37.2%, then it should take the 2% discount and forgo the additional trade credit.

The following equation can be used to calculate the nominal cost (on an annual basis) of not taking discounts, illustrated with terms of 2/10, net 30:

$$\text{Nominal cost of trade credit} = \text{Cost per period} \times \text{Number of periods per year}$$

$$\text{Nominal cost of trade credit} = \frac{\text{Discount percentage}}{100 - \text{Discount percentage}} \times \frac{365}{\text{Days credit is outstanding} - \text{Discount period}} \quad (16-8)$$

$$= \frac{2}{98} \times \frac{365}{20} = 2.04\% \times 18.25 = 37.2\%$$

The numerator of the first term, Discount percentage, is the cost per dollar of credit, while the denominator,  $100 - \text{Discount percentage}$ , represents the funds made available by not taking the discount. Thus, the first term, 2.04%, is the cost per period for the trade credit. The denominator of the second term is the number of days of extra credit obtained by not taking the discount, so the entire second term shows how many times each year the cost is incurred—18.25 times in this example.

This nominal annual cost formula does not consider the compounding of interest. In terms of effective annual interest, the cost of trade credit is even higher:

$$\text{Effective annual rate} = (1.0204)^{18.25} - 1.0 = 1.4459 - 1.0 = 44.6\%$$

Thus, the 37.2% nominal cost calculated with Equation 16-8 actually understates the true cost.

Note, however, that the calculated cost of trade credit can be reduced by paying late. Thus, if PCC could get away with paying in 60 days rather than the specified 30 days, then the effective credit period would become  $60 - 10 = 50$  days, the number of times the discount would be lost would fall to  $365/50 = 7.3$ , and the nominal cost would drop from 37.2% to  $2.04\% \times 7.3 = 14.9\%$ . Then the effective annual rate would drop from 44.6% to 15.9%:

$$\text{Effective annual rate} = (1.0204)^{7.3} - 1.0 = 1.1589 - 1.0 = 15.9\%$$

In periods of excess capacity, firms may be able to get away with deliberately paying late, or **stretching accounts payable**. However, they will also suffer a variety of problems associated with being a “slow payer.” These problems are discussed later in the chapter.

FIGURE 16-7 Varying Credit Terms and Their Associated Costs



	A	B	C	D	E	F
31						
32	Days in year: 365				Cost of additional credit	
33						
34	Credit terms	Discount	Discount period	Net period	Nominal	Effective
35	1/10, net 20	1%	10	20	36.87%	44.32%
36	1/10, net 30	1%	10	30	18.43%	20.13%
37	1/10, net 90	1%	10	90	4.61%	4.69%
38	2/10, net 20	2%	10	20	74.49%	109.05%
39	2/10, net 30	2%	10	30	37.24%	44.59%
40	3/15, net 45	3%	15	45	37.63%	44.86%

The costs of the additional trade credit from forgoing discounts under some other purchase terms are taken from the chapter's *Excel Tool Kit* model and shown here as Figure 16-7. As these numbers indicate, the cost of not taking discounts can be substantial.

On the basis of the preceding discussion, trade credit can be divided into two components: (1) **free trade credit**, which involves credit received during the discount period, and (2) **costly trade credit**, which involves credit in excess of the free trade credit and whose cost is an implicit one based on the forgone discounts. *Firms should always use the free component, but they should use the costly component only after analyzing the cost of this capital to make sure it is less than the cost of funds that could be obtained from other sources.* Under the terms of trade found in most industries, the costly component is relatively expensive, so stronger firms generally avoid using it.

Note, though, that firms sometimes offer favorable credit terms in order to stimulate sales. For example, suppose a firm has been selling on terms of 2/10, net 30, with a nominal cost of 37.24%, but a recession has reduced sales and the firm now has excess capacity. It wants to boost the sales of its product without cutting the list price, so it might offer terms of 1/10, net 90, which implies a nominal cost of additional credit of only 4.61%. In this situation, its customers would probably be wise to take the additional credit and reduce their reliance on banks and other lenders. So, turning down discounts is not always a bad decision.

### Self-Test

What are accruals? How much control do managers have over accruals?

What is trade credit?

What's the difference between free trade credit and costly trade credit?

How does the cost of costly trade credit generally compare with the cost of short-term bank loans?

A company buys on terms of 2/12, net 28. What is its nominal cost of trade credit? (46.6%) The effective cost? (58.5%)

## 16.10 SHORT-TERM MARKETABLE SECURITIES

Short-term marketable securities are held for two separate and distinct purposes: (1) to provide liquidity, as a substitute for cash; and (2) as a nonoperating investment, generally on a temporary basis while awaiting deployment for long-term, permanent



For updates, see <http://finance.yahoo.com>, get a quote for MRK, and take a look at its balance sheets.

investments. Of course, it is difficult to separate these two purposes, because securities held while awaiting reinvestment are available for liquidity purposes.

Marketable securities typically provide much lower yields than operating assets. For example, in January 2009 Merck held approximately \$1.1 billion in short-term marketable securities in addition to \$4.4 billion in cash and cash equivalents. Two years earlier, in 2007, it held \$2.8 billion of short-term securities plus \$5.9 billion of cash and cash equivalents. Why would Merck hold such a large amount of low-yielding assets?

Consider first the *reduction* in cash and securities from 2007 to 2009. At the earlier date, Merck was in the midst of a series of trials over allegations that its drug Vioxx had caused a number of fatal heart attacks. This case was settled in 2008, so the cash and securities it had been holding to cover potential losses could be reduced. This demonstrates one reason why firms sometimes hold what seems to be an excessive amount of cash and securities. Other reasons include needing to pay off maturing bonds or paying for plants under construction.

With regard to operating funds, companies typically lump liquid marketable securities in with currency and bank demand deposits and call the total “cash and cash equivalents.” These are the current assets that the firm needs to carry in its operations on an uninterrupted basis. If the company needs to write checks in amounts greater than its demand deposits, it simply makes a phone call to a broker and places a market sell order; the broker in turn will sell the securities, and almost immediately the sale proceeds will be deposited in the firm’s bank account. Because cash and most commercial checking accounts yield nothing whereas marketable securities provide at least a modest return, firms choose to hold part of their liquid assets as marketable securities rather than pure cash balances.

Note also that firms’ cash and equivalents holdings can be reduced by having unused credit lines with banks. A firm can negotiate a line of credit under which it can borrow immediately if it needs cash for transactions. It can simply call the bank, ask to “take down” a portion of its line, and the bank will immediately deposit funds in its account that can then be used for writing checks.

There are both benefits and costs associated with holding marketable securities. The benefits are twofold: (1) the firm reduces risk and transaction costs, because it won’t have to issue securities or borrow as frequently to raise cash; and (2) it will have ready cash to take advantage of bargain purchases or growth opportunities. Funds held for the second reason are called **speculative balances**. The primary disadvantage is that the after-tax return on short-term securities is very low. Thus, firms face a trade-off between benefits and costs.

Recent research supports this trade-off hypothesis as an explanation for firms’ cash holdings.<sup>20</sup> Firms with high growth opportunities suffer the most if they don’t have ready cash to quickly take advantage of an opportunity, and the data show that these firms do hold relatively high levels of marketable securities. Firms with volatile cash flows are the ones most likely to run low on cash, so they tend to hold high levels of cash. In contrast, cash holdings are less important to large firms with high credit ratings, because they have quick and inexpensive access to capital markets. As expected, such firms hold relatively low levels of cash. Of course, there will always be outliers such as Microsoft, which is large, strong, and cash-rich, but volatile firms with good growth opportunities are still the ones that hold the most marketable securities, on average.

<sup>20</sup>See Tim Opler, Lee Pinkowitz, René Stulz, and Rohan Williamson, “The Determinants and Implications of Corporate Cash Holdings,” *Journal of Financial Economics*, 1999, pp. 3–46. For additional insights into maturity choice, see Karlyn Mitchell, “The Debt Maturity Choice: An Empirical Investigation,” *Journal of Financial Research*, Winter 1993, pp. 309–320.

**Self-Test**

Why might a company hold low-yielding marketable securities when it could earn a much higher return on operating assets?

## 16.11 SHORT-TERM FINANCING

The three possible short-term financing policies described earlier in the chapter were distinguished by the relative amounts of short-term debt used under each policy. The aggressive policy called for the greatest use of short-term debt, and the conservative policy called for using the least; maturity matching fell in between. Although short-term credit is generally riskier than long-term credit, using short-term funds does have some significant advantages. The pros and cons of short-term financing are considered in this section.

### Advantages of Short-Term Financing

First, a short-term loan can be obtained much faster than long-term credit. Lenders will insist on a more thorough financial examination before extending long-term credit, and the loan agreement will have to be spelled out in considerable detail because a lot can happen during the life of a 10- to 20-year loan. Therefore, if funds are needed in a hurry, the firm should look to the short-term markets.

Second, if its needs for funds are seasonal or cyclical, then a firm may not want to commit itself to long-term debt. There are three reasons for this: (1) Flotation costs are higher for long-term debt than for short-term credit. (2) Although long-term debt can be repaid early (provided the loan agreement includes a prepayment provision), prepayment penalties can be expensive. Accordingly, if a firm thinks its need for funds will diminish in the near future, it should choose short-term debt. (3) Long-term loan agreements always contain provisions, or covenants, that constrain the firm's future actions. Short-term credit agreements are generally less restrictive.

The third advantage is that, because the yield curve is normally upward sloping, interest rates are generally lower on short-term debt. Thus, under normal conditions, interest costs at the time the funds are obtained will be lower if the firm borrows on a short-term rather than a long-term basis.

### Disadvantages of Short-Term Debt

Even though short-term rates are often lower than long-term rates, using short-term credit is riskier for two reasons: (1) If a firm borrows on a long-term basis then its interest costs will be relatively stable over time, but if it uses short-term credit then its interest expense will fluctuate widely, at times going quite high. For example, the rate banks charged large corporations for short-term debt more than tripled over a 2-year period in the 1980s, rising from 6.25% to 21%. Many firms that had borrowed heavily on a short-term basis simply could not meet their rising interest costs; as a result, bankruptcies hit record levels during that period. (2) If a firm borrows heavily on a short-term basis, a temporary recession may render it unable to repay this debt. If the borrower is in a weak financial position then the lender may not extend the loan, which could force the firm into bankruptcy.

**Self-Test**

What are the advantages and disadvantages of short-term debt compared with long-term debt?

## 16.12 SHORT-TERM BANK LOANS

Loans from commercial banks generally appear on balance sheets as notes payable. A bank's importance is actually greater than it appears from the dollar amounts

shown on balance sheets because banks provide *nonspontaneous* funds. As a firm's financing needs increase, it requests additional funds from its bank. If the request is denied, the firm may be forced to abandon attractive growth opportunities. The key features of bank loans are discussed in the following paragraphs.

## Maturity

Although banks do make longer-term loans, *the bulk of their lending is on a short-term basis*—about two-thirds of all bank loans mature in a year or less. Bank loans to businesses are frequently written as 90-day notes, so the loan must be repaid or renewed at the end of 90 days. Of course, if a borrower's financial position has deteriorated then the bank may refuse to renew the loan. This can mean serious trouble for the borrower.

## Promissory Notes

When a bank loan is approved, the agreement is executed by signing a **promissory note**. The note specifies (1) the amount borrowed, (2) the interest rate, (3) the repayment schedule, which can call for either a lump sum or a series of installments, (4) any collateral that might have to be put up as security for the loan, and (5) any other terms and conditions to which the bank and the borrower have agreed. When the note is signed, the bank credits the borrower's checking account with the funds; hence both cash and notes payable increase on the borrower's balance sheet.

## Compensating Balances

Banks sometimes require borrowers to maintain an average demand deposit (checking account) balance of 10% to 20% of the loan's face amount. This is called a compensating balance, and such balances raise the effective interest rate on the loans. For example, if a firm needs \$80,000 to pay off outstanding obligations but it must maintain a 20% compensating balance, then it must borrow \$100,000 to obtain a usable \$80,000. If the stated annual interest rate is 8%, the effective cost is actually 10%: \$8,000 interest divided by \$80,000 of usable funds equals 10%.<sup>21</sup>

As we noted earlier in the chapter, recent surveys indicate that compensating balances are much less common now than earlier. In fact, compensating balances are now illegal in many states. Despite this trend, some small banks in states where compensating balances are legal still require their customers to maintain them.

## Informal Line of Credit

A **line of credit** is an informal agreement between a bank and a borrower indicating the maximum credit the bank will extend to the borrower. For example, on December 31, a bank loan officer might indicate to a financial manager that the bank regards the firm as being "good" for up to \$80,000 during the forthcoming year, provided the borrower's financial condition does not deteriorate. If on January 10 the financial manager signs a 90-day promissory note for \$15,000, this would be called "taking down" \$15,000 of the total line of credit. This amount would be credited to the firm's checking account at the bank, and the firm could borrow additional amounts up to a total of \$80,000 outstanding at any one time.

<sup>21</sup>Note, however, that the compensating balance may be set as a minimum monthly *average*, and if the firm would maintain this average anyway then the compensating balance requirement would not raise the effective interest rate. Also, note that these loan compensating balances are *added to* any compensating balances that the firm's bank may require for services performed, such as clearing checks.

## Revolving Credit Agreement

A **revolving credit agreement** is a formal line of credit often used by large firms. To illustrate, suppose in 2010 Texas Petroleum Company negotiated a revolving credit agreement for \$100 million with a group of banks. The banks were formally committed for 4 years to lend the firm up to \$100 million if the funds were needed. Texas Petroleum, in turn, paid an annual commitment fee of 0.25% on the unused balance of the commitment to compensate the banks for making the commitment. Thus, if Texas Petroleum did not take down any of the \$100 million commitment during a year, it would still be required to pay a \$250,000 annual fee, normally in monthly installments of \$20,833.33. If it borrowed \$50 million on the first day of the agreement, then the unused portion of the line of credit would fall to \$50 million and the annual fee would fall to \$125,000. Of course, interest would also have to be paid on the money Texas Petroleum actually borrowed. As a general rule, the interest rate on “revolvers” is pegged to the London Interbank Offered Rate (LIBOR), the T-bill rate, or some other market rate, so the cost of the loan varies over time as interest rates change. The interest that Texas Petroleum must pay was set at the prime lending rate plus 1.0%.

Observe that a revolving credit agreement is similar to an informal line of credit but has an important difference: The bank has a *legal obligation* to honor a revolving credit agreement, and it receives a commitment fee. Neither the legal obligation nor the fee exists under the informal line of credit.

Often a line of credit will have a **cleanup clause** that requires the borrower to reduce the loan balance to zero at least once a year. Keep in mind that a line of credit typically is designed to help finance seasonal or cyclical peaks in operations, not as a source of permanent capital. For example, our cash budget for Educational Products Corporation showed negative flows from July through September but positive flows from October through December. Also, the cumulative net cash flow goes positive in November, indicating that the firm could pay off its loan at that time. If the cumulative flows were always negative, this would indicate that the firm was using its credit lines as a permanent source of financing.

## Costs of Bank Loans

The costs of bank loans vary for different types of borrowers at any given point in time and for all borrowers over time. Interest rates are higher for riskier borrowers, and rates are also higher on smaller loans because of the fixed costs involved in making and servicing loans. If a firm can qualify as a “prime credit” because of its size and financial strength, it can borrow at the **prime rate**, which at one time was the lowest rate banks charged. Rates on other loans are generally scaled up from the prime rate. Loans to large, strong customers are made at rates tied to LIBOR; and the costs of such loans are generally well below prime:

<u>Rates on June 28, 2009</u>	
Prime	3.25%
1-Year LIBOR	1.520%

The rate to smaller, riskier borrowers is generally stated something like “prime plus 1.0%”; but for a larger borrower it is generally stated as something like “LIBOR plus 1.5%.”

Bank rates vary widely over time depending on economic conditions and Federal Reserve policy. When the economy is weak, loan demand is usually slack, inflation is

low, and the Fed makes plenty of money available to the system. As a result, rates on all types of loans are relatively low. Conversely, when the economy is booming, loan demand is typically strong, the Fed restricts the money supply to fight inflation, and the result is high interest rates. As an indication of the kinds of fluctuations that can occur, the prime rate during 1980 rose from 11% to 21% in just four months; during 1994, it rose from 6% to 9%.

**Calculating Banks' Interest Charges: Regular (or "Simple") Interest.** Banks calculate interest in several different ways. In this section we explain the procedure used for most business loans. For illustration purposes, we assume a loan of \$10,000 at the prime rate, currently 3.25%, with a 360-day year. Interest must be paid monthly, and the principal is payable "on demand" if and when the bank wants to end the loan. Such a loan is called a **regular** (or **simple**) **interest** loan.

We begin by dividing the nominal interest rate (3.25% in this case) by 360 to obtain the rate per day. This rate is expressed as a *decimal fraction*, not as a percentage:

$$\begin{aligned}\text{Simple interest rate per day} &= \frac{\text{Nominal rate}}{\text{Days in year}} \\ &= 0.0325/360 = 0.000090278\end{aligned}$$

To find the monthly interest payment, the daily rate is multiplied by the amount of the loan, then by the number of days during the payment period. For our illustrative loan, the daily interest charge would be \$0.90277778, and the total for a 30-day month would be \$27.08:

$$\begin{aligned}\text{Interest charge for month} &= (\text{Rate per day})(\text{Amount of loan})(\text{Days in month}) \\ &= (0.000090278)(\$10,000)(30 \text{ days}) = \$27.08\end{aligned}$$

The *effective interest rate* on a loan depends on how frequently interest must be paid—the more frequently interest is paid, the higher the effective rate. If interest is paid once per year, then the nominal rate is also the effective rate. However, if interest must be paid monthly, then the effective rate is  $(1 + 0.0325/12)^{12} - 1 = 3.2989\%$ .

**Calculating Banks' Interest Charges: Add-on Interest.** Banks and other lenders typically use **add-on interest** for automobiles and other types of installment loans. The term *add-on* means that the interest is calculated and then added to the amount borrowed to determine the loan's face value. To illustrate, suppose you borrow \$10,000 on an add-on basis at a nominal rate of 7.25% to buy a car, with the loan to be repaid in 12 monthly installments. At a 7.25% add-on rate, you would make total interest payments of  $\$10,000(0.0725) = \$725$ . However, since the loan is paid off in monthly installments, you would have the use of the full \$10,000 for only the first month; then the outstanding balance would decline until, during the last month, only 1/12 of the original loan was still outstanding. Thus, you would be paying \$725 for the use of only about half the loan's face amount, since the average usable funds would be only about \$5,000. Therefore, we can calculate the approximate annual rate as 14.5%:

$$\begin{aligned}\text{Approximate annual rate}_{\text{Add-on}} &= \frac{\text{Interest paid}}{(\text{Amount received})/2} \\ &= \frac{\$725}{\$10,000/2} = 14.5\%\end{aligned}$$

(16-9)

### Self-Test

The annual percentage rate (APR) the bank would provide to the borrower would be 13.12%, and the true effective annual rate would be 13.94%.<sup>22</sup> Both of these rates are much higher than the nominal 7.25%.

What is a promissory note, and what are some terms that are normally included in promissory notes?

What is a line of credit? A revolving credit agreement?

What's the difference between simple interest and add-on interest?

Explain how a firm that expects to need funds during the coming year might make sure the that needed funds will be available.

How does the cost of costly trade credit generally compare with the cost of short-term bank loans?

If a firm borrowed \$500,000 at a rate of 10% simple interest with monthly interest payments and a 365-day year, what would be the required interest payment for a 30-day month? (**\$4,109.59**) If interest must be paid monthly, what would be the effective annual rate? (**10.47%**)

If this loan had been made on a 10% add-on basis, payable in 12 end-of-month installments, what would be the monthly payment amount? (**\$45,833.33**) What is the annual percentage rate? (**17.97%**) The effective annual rate? (**19.53%**)

# WWW

For updates on the outstanding balances of commercial paper, go to <http://www.federalreserve.gov/releases> and check out the daily releases for Commercial Paper and the weekly releases for Assets and Liabilities of Commercial Banks in the United States.

## 16.13 COMMERCIAL PAPER

**Commercial paper** is a type of unsecured promissory note issued by large, strong firms and sold primarily to other business firms, to insurance companies, to pension funds, to money market mutual funds, and to banks. In March 2009, there was approximately \$1.4 trillion of commercial paper outstanding, versus nearly \$1.5 trillion of commercial and industrial bank loans. Most, but not all, commercial paper outstanding is issued by financial institutions.

### Maturity and Cost

Maturities of commercial paper generally vary from 1 day to 9 months, with an average of about 5 months.<sup>23</sup> The interest rate on commercial paper fluctuates with supply and demand conditions—it is determined in the marketplace, varying daily as conditions change. Recently, commercial paper rates have ranged from 1.5 to 3.5 percentage points below the stated prime rate and up to half of a percentage point above the T-bill rate. For example, in March 2009, the average rate on 3-month commercial paper was 0.60%, the prime rate was 3.25%, and the 3-month T-bill rate was 0.22%.

### Use of Commercial Paper

The use of commercial paper is restricted to a comparatively small number of very large concerns that are exceptionally good credit risks. Dealers prefer to handle the

# WWW

For current rates, see <http://www.federalreserve.gov/releases> and look at the Daily Releases for Selected Interest Rates.

<sup>22</sup>To find the annual percentage rate and the effective rate on an add-on loan, we first find the payment per month,  $\$10,725/12 = \$893.75$ . With a financial calculator, enter  $N = 12$ ,  $PV = 10000$ ,  $PMT = -893.75$ , and  $FV = 0$ ; then press  $I/YR$  to obtain 1.093585%. This is a monthly rate, so multiply by 12 to get 13.12%, which is the APR the bank would report to the borrower. The effective annual rate would then be  $(1.010936)^{12} - 1 = 13.94\%$ , quite a bit above the APR.

<sup>23</sup>The maximum maturity without SEC registration is 270 days. Also, commercial paper can be sold only to “sophisticated” investors; otherwise, SEC registration would be required even for maturities of 270 days or less.

paper of firms whose net worth is \$100 million or more and whose annual borrowing exceeds \$10 million. One potential problem with commercial paper is that a debtor who is in temporary financial difficulty may receive little help because commercial paper dealings are generally less personal than are bank relationships. Thus, banks are generally more able and willing to help a good customer weather a temporary storm than is a commercial paper dealer. On the other hand, using commercial paper permits a corporation to tap a wide range of credit sources, including financial institutions outside its own area and industrial corporations across the country, and this can reduce interest costs.

#### Self-Test

What is commercial paper?

What types of companies can use commercial paper to meet their short-term financing needs?

How does the cost of commercial paper compare with the cost of short-term bank loans? With the cost of Treasury bills?

## 16.14 USE OF SECURITY IN SHORT-TERM FINANCING

Thus far, we have not addressed the question of whether or not short-term loans should be secured. Commercial paper is never secured, but other types of loans can be secured if this is deemed necessary or desirable. Other things held constant, it is better to borrow on an unsecured basis, since the bookkeeping costs of **secured loans** are often high. However, firms often find that they can borrow only if they put up some type of collateral to protect the lender or that, by using security, they can borrow at a much lower rate.

Several different kinds of collateral can be employed, including marketable stocks or bonds, land or buildings, equipment, inventory, and accounts receivable. Marketable securities make excellent collateral, but few firms that need loans also hold portfolios of stocks and bonds. Similarly, real property (land and buildings) and equipment are good forms of collateral, but they are generally used as security for long-term loans rather than for working capital loans. Therefore, most secured short-term business borrowing involves the use of accounts receivable and inventories as collateral.

To understand the use of security, consider the case of a Chicago hardware dealer who wanted to modernize and expand his store. He requested a \$200,000 bank loan. After examining the business's financial statements, his bank indicated that it would lend him a maximum of \$100,000 and that the effective interest rate would be 9%. The owner had a substantial personal portfolio of stocks, and he offered to put up \$300,000 of high-quality stocks to support the \$200,000 loan. The bank then granted the full \$200,000 loan at the prime rate of 3.25%. The store owner might also have used his inventories or receivables as security for the loan, but processing costs would have been high.<sup>24</sup>



#### Self-Test

What is a secured loan?

What are some types of current assets that are pledged as security for short-term loans?

<sup>24</sup>The term "asset-based financing" is often used as a synonym for "secured financing." In recent years, accounts receivable have been used as security for long-term bonds, permitting corporations to borrow from lenders such as pension funds rather than just from banks and other traditional short-term lenders.

## Summary

This chapter discussed working capital management and short-term financing. The key concepts covered are listed below.

- **Working capital** refers to current assets used in operations, and **net working capital** is defined as current assets minus all current liabilities. **Net operating working capital** is defined as operating current assets minus operating current liabilities.
- Under a **relaxed working capital policy**, a firm would hold relatively large amounts of each type of current asset. Under a **restricted working capital policy**, the firm would hold minimal amounts of these items.
- A **moderate** approach to short-term financing involves matching, to the extent possible, the maturities of assets and liabilities, so that temporary current operating assets are financed with short-term debt and permanent current operating assets and fixed assets are financed with long-term debt or equity. Under an **aggressive** approach, some permanent current operating assets, and perhaps even some fixed assets, are financed with short-term debt. A **conservative** approach would be to use long-term sources to finance all permanent operating capital and some of the temporary current operating assets.
- **Permanent current operating assets** are the operating current assets the firm holds even during slack times, whereas **temporary current operating assets** are the additional operating current assets needed during seasonal or cyclical peaks. The methods used to finance permanent and temporary current operating assets define the firm's **short-term financing policy**.
- The **inventory conversion period** is the average time required to convert materials into finished goods and then to sell those goods:

$$\text{Inventory conversion period} = \text{Inventory} \div \text{Cost of goods sold per day}$$

- The **average collection period** is the average length of time required to convert the firm's receivables into cash—that is, to collect cash following a sale:

$$\text{Average collection period} = \text{DSO} = \text{Receivables} \div (\text{Sales}/365)$$

- The **payables deferral period** is the average length of time between the purchase of materials and labor and the payment of cash for them:

$$\text{Payables deferral period} = \text{Payables} \div \text{Cost of goods sold per day}$$

- The **cash conversion cycle (CCC)** is the length of time between the firm's actual cash expenditures to pay for productive resources (materials and labor) and its own cash receipts from the sale of products (that is, the length of time between paying for labor and materials and collecting on receivables):

$$\begin{array}{cccc} \text{Cash} & \text{Inventory} & \text{Average} & \text{Payables} \\ \text{conversion} & = & \text{conversion} & + & \text{collection} & - & \text{deferral} \\ \text{cycle} & & \text{period} & & \text{period} & & \text{period} \end{array}$$

- A **cash budget** is a schedule showing projected cash inflows and outflows over some period. The cash budget is used to predict cash surpluses and deficits, and it is the primary cash management planning tool.
- The **primary goal of cash management** is to minimize the amount of cash the firm must hold for conducting its normal business activities while at the same

time maintaining a sufficient cash reserve to take discounts, pay bills promptly, and meet any unexpected cash needs.

- The **transactions balance** is the cash necessary to conduct routine day-to-day business; **precautionary balances** are cash reserves held to meet random, unforeseen needs. A **compensating balance** is a minimum checking account balance that a bank requires as compensation either for services provided or as part of a loan agreement.
- The twin goals of **inventory management** are (1) to ensure that the inventories needed to sustain operations are available, but (2) to hold the costs of ordering and carrying inventories to the lowest possible level.
- When a firm sells goods to a customer on credit, an **account receivable** is created.
- A firm can use an **aging schedule** and the **days sales outstanding (DSO)** to monitor its receivables balance and to help avoid an increase in bad debts.
- A firm's **credit policy** consists of four elements: (1) credit period, (2) discounts given for early payment, (3) credit standards, and (4) collection policy.
- **Accounts payable**, or **trade credit**, arises spontaneously as a result of credit purchases. Firms should use all the **free trade credit** they can obtain, but they should use **costly trade credit** only if it is less expensive than other forms of short-term debt. Suppliers often offer discounts to customers who pay within a stated period. The following equation may be used to calculate the nominal cost, on an annual basis, of not taking such discounts:

$$\text{Nominal annual cost of trade credit} = \frac{\text{Discount percentage}}{100 - \text{Discount percentage}} \times \frac{365}{\text{Days credit is outstanding} - \text{Discount period}}$$

- The advantages of short-term credit are (1) the **speed** with which short-term loans can be arranged, (2) increased **flexibility**, and (3) generally **lower interest rates** than with long-term credit. The principal disadvantage of short-term credit is the **extra risk** the borrower must bear because (1) the lender can demand payment on short notice, and (2) the cost of the loan will increase if interest rates rise.
- **Bank loans** are an important source of short-term credit. When a bank loan is approved, a **promissory note** is signed. It specifies: (1) the amount borrowed, (2) the percentage interest rate, (3) the repayment schedule, (4) the collateral, and (5) any other conditions to which the parties have agreed.
- Banks sometimes require borrowers to maintain **compensating balances**, which are deposit requirements set at between 10% and 20% of the loan amount. Compensating balances raise the effective interest rate on bank loans.
- A **line of credit** is an informal agreement between the bank and the borrower indicating the maximum amount of credit the bank will extend to the borrower.
- A **revolving credit agreement** is a formal line of credit often used by large firms; it involves a **commitment fee**.
- A **simple interest** loan is one in which interest must be paid monthly and the principal is payable "on demand" if and when the bank wants to end the loan.
- An **add-on interest loan** is one in which interest is calculated and added to the funds received to determine the face amount of the installment loan.
- **Commercial paper** is unsecured short-term debt issued by large, financially strong corporations. Although the cost of commercial paper is lower than the cost of bank loans, it can be used only by large firms with exceptionally strong credit ratings.

- Sometimes a borrower will find it is necessary to borrow on a **secured basis**, in which case the borrower pledges assets such as real estate, securities, equipment, inventories, or accounts receivable as collateral for the loan. For a more detailed discussion of secured financing, see *Web Extension 16A*.

## Questions

- (16-1) Define each of the following terms:
- Working capital; net working capital; net operating working capital
  - Relaxed policy; restricted policy; moderate policy
  - Permanent current operating assets; temporary current operating assets
  - Moderate (maturity matching) financing policy; aggressive financing policy; conservative financing policy
  - Inventory conversion period; average collection period; payables deferral period; cash conversion cycle
  - Cash budget; target cash balance
  - Transactions balances; compensating balances; precautionary balances
  - Trade discounts
  - Credit policy; credit period; credit standards; collection policy; cash discounts
  - Account receivable; days sales outstanding; aging schedule
  - Accruals; trade credit
  - Stretching accounts payable; free trade credit; costly trade credit
  - Promissory note; line of credit; revolving credit agreement
  - Commercial paper; secured loan
- (16-2) What are the two principal reasons for holding cash? Can a firm estimate its target cash balance by summing the cash held to satisfy each of the two reasons?
- (16-3) Is it true that, when one firm sells to another on credit, the seller records the transaction as an account receivable while the buyer records it as an account payable and that, disregarding discounts, the receivable typically exceeds the payable by the amount of profit on the sale?
- (16-4) What are the four elements of a firm's credit policy? To what extent can firms set their own credit policies as opposed to accepting policies that are dictated by its competitors?
- (16-5) What are the advantages of matching the maturities of assets and liabilities? What are the disadvantages?
- (16-6) From the standpoint of the borrower, is long-term or short-term credit riskier? Explain. Would it ever make sense to borrow on a short-term basis if short-term rates were above long-term rates?
- (16-7) Discuss this statement: "Firms can control their accruals within fairly wide limits."
- (16-8) Is it true that most firms are able to obtain some free trade credit and that additional trade credit is often available, but at a cost? Explain.
- (16-9) What kinds of firms use commercial paper?

## Self-Test Problems

Solutions Appear in Appendix A

(ST-1)  
Working Capital  
Policy

The Calgary Company is attempting to establish a current assets policy. Fixed assets are \$600,000, and the firm plans to maintain a 50% debt-to-assets ratio. Calgary has no operating current liabilities. The interest rate is 10% on all debt. Three alternative current asset policies are under consideration: 40%, 50%, and 60% of projected sales. The company expects to earn 15% before interest and taxes on sales of \$3 million. Calgary's effective federal-plus-state tax rate is 40%. What is the expected return on equity under each asset policy?

(ST-2)  
Current Asset  
Financing

Vanderheiden Press Inc. and the Herrenhouse Publishing Company had the following balance sheets as of December 31, 2010 (thousands of dollars):

	Vanderheiden Press	Herrenhouse Publishing
Current assets	\$100,000	\$ 80,000
Fixed assets (net)	<u>100,000</u>	<u>120,000</u>
Total assets	<u>\$200,000</u>	<u>\$200,000</u>
Current liabilities	\$ 20,000	\$ 80,000
Long-term debt	80,000	20,000
Common stock	50,000	50,000
Retained earnings	<u>50,000</u>	<u>50,000</u>
Total liabilities and equity	<u>\$200,000</u>	<u>\$200,000</u>

Earnings before interest and taxes for both firms are \$30 million, and the effective federal-plus-state tax rate is 40%.

- What is the return on equity for each firm if the interest rate on current liabilities is 10% and the rate on long-term debt is 13%?
- Assume that the short-term rate rises to 20%, that the rate on new long-term debt rises to 16%, and that the rate on existing long-term debt remains unchanged. What would be the return on equity for Vanderheiden Press and Herrenhouse Publishing under these conditions?
- Which company is in a riskier position? Why?

## Problems

Answers Appear in Appendix B

EASY PROBLEMS 1–5

(16-1)  
Cash Management

Williams & Sons last year reported sales of \$10 million and an inventory turnover ratio of 2. The company is now adopting a new inventory system. If the new system is able to reduce the firm's inventory level and increase the firm's inventory turnover ratio to 5 while maintaining the same level of sales, how much cash will be freed up?

(16-2)  
Receivables  
Investment

Medwig Corporation has a DSO of 17 days. The company averages \$3,500 in credit sales each day. What is the company's average accounts receivable?

**(16-3)** What is the nominal and effective cost of trade credit under the credit terms of 3/15, net 30?  
Cost of Trade Credit

**(16-4)** A large retailer obtains merchandise under the credit terms of 1/15, net 45, but routinely takes 60 days to pay its bills. (Because the retailer is an important customer, suppliers allow the firm to stretch its credit terms.) What is the retailer's effective cost of trade credit?  
Cost of Trade Credit

**(16-5)** A chain of appliance stores, APP Corporation, purchases inventory with a net price of \$500,000 each day. The company purchases the inventory under the credit terms of 2/15, net 40. APP always takes the discount but takes the full 15 days to pay its bills. What is the average accounts payable for APP?  
Accounts Payable

#### INTERMEDIATE PROBLEMS

6-12

**(16-6)** McDowell Industries sells on terms of 3/10, net 30. Total sales for the year are \$912,500. Forty percent of customers pay on the 10th day and take discounts; the other 60% pay, on average, 40 days after their purchases.  
Receivables Investment

- What is the days sales outstanding?
- What is the average amount of receivables?
- What would happen to average receivables if McDowell toughened its collection policy with the result that all nondiscount customers paid on the 30th day?

**(16-7)** Calculate the nominal annual cost of nonfree trade credit under each of the following terms. Assume that payment is made either on the discount date or on the due date.  
Cost of Trade Credit

- 1/15, net 20
- 2/10, net 60
- 3/10, net 45
- 2/10, net 45
- 2/15, net 40

**(16-8)** a. If a firm buys under terms of 3/15, net 45, but actually pays on the 20th day and *still takes the discount*, what is the nominal cost of its nonfree trade credit?  
Cost of Trade Credit  
b. Does it receive more or less credit than it would if it paid within 15 days?

**(16-9)** Grunewald Industries sells on terms of 2/10, net 40. Gross sales last year were \$4,562,500 and accounts receivable averaged \$437,500. Half of Grunewald's customers paid on the 10th day and took discounts. What are the nominal and effective costs of trade credit to Grunewald's nondiscount customers? (*Hint: Calculate sales/day based on a 365-day year, then calculate average receivables of discount customers, and then find the DSO for the nondiscount customers.*)  
Cost of Trade Credit

**(16-10)** The D.J. Masson Corporation needs to raise \$500,000 for 1 year to supply working capital to a new store. Masson buys from its suppliers on terms of 3/10, net 90, and it currently pays on the 10th day and takes discounts. However, it could forgo the discounts, pay on the 90th day, and thereby obtain the needed \$500,000 in the form of costly trade credit. What is the effective annual interest rate of this trade credit?  
Effective Cost of Trade Credit

**(16-11)** The Zocco Corporation has an inventory conversion period of 60 days, an average collection period of 38 days, and a payables deferral period of 30 days. Assume that cost of goods sold is 75% of sales.  
Cash Conversion Cycle

- a. What is the length of the firm's cash conversion cycle?
- b. If Zocco's annual sales are \$3,421,875 and all sales are on credit, what is the firm's investment in accounts receivable?
- c. How many times per year does Zocco turn over its inventory?

**(16-12)**Working Capital Cash  
Flow Cycle

The Christie Corporation is trying to determine the effect of its inventory turnover ratio and days sales outstanding (DSO) on its cash flow cycle. Christie's sales last year (all on credit) were \$150,000, and it earned a net profit of 6%, or \$9,000. It turned over its inventory 7.5 times during the year, and its DSO was 36.5 days. Its annual cost of goods sold was \$121,667. The firm had fixed assets totaling \$35,000. Christie's payables deferral period is 40 days.

- a. Calculate Christie's cash conversion cycle.
- b. Assuming Christie holds negligible amounts of cash and marketable securities, calculate its total assets turnover and ROA.
- c. Suppose Christie's managers believe the annual inventory turnover can be raised to 9 times without affecting sales. What would Christie's cash conversion cycle, total assets turnover, and ROA have been if the inventory turnover had been 9 for the year?

## CHALLENGING PROBLEMS

13-17

**(16-13)**

Working Capital Policy

The Rentz Corporation is attempting to determine the optimal level of current assets for the coming year. Management expects sales to increase to approximately \$2 million as a result of an asset expansion presently being undertaken. Fixed assets total \$1 million, and the firm wishes to maintain a 60% debt ratio. Rentz's interest cost is currently 8% on both short-term and longer-term debt (both of which the firm uses in its permanent capital structure). Three alternatives regarding the projected current asset level are available to the firm: (1) a tight policy requiring current assets of only 45% of projected sales, (2) a moderate policy of 50% of sales in current assets, and (3) a relaxed policy requiring current assets of 60% of sales. The firm expects to generate earnings before interest and taxes at a rate of 12% on total sales.

- a. What is the expected return on equity under each current asset level? (Assume a 40% effective federal-plus-state tax rate.)
- b. In this problem, we have assumed that the level of expected sales is independent of current asset policy. Is this a valid assumption?
- c. How would the overall riskiness of the firm vary under each policy?

**(16-14)**

Cash Budgeting

Dorothy Koehl recently leased space in the Southside Mall and opened a new business, Koehl's Doll Shop. Business has been good, but Koehl has frequently run out of cash. This has necessitated late payment on certain orders, which is beginning to cause a problem with suppliers. Koehl plans to borrow from the bank to have cash ready as needed, but first she needs a forecast of just how much she should borrow. Accordingly, she has asked you to prepare a cash budget for the critical period around Christmas, when needs will be especially high.

Sales are made on a cash basis only. Koehl's purchases must be paid for during the following month. Koehl pays herself a salary of \$4,800 per month, and the rent is \$2,000 per month. In addition, she must make a tax payment of \$12,000 in December. The current cash on hand (on December 1) is \$400, but Koehl has agreed to maintain an average bank balance of \$6,000—this is her target cash balance. (Disregard cash in the till, which is insignificant because Koehl keeps only a small amount on hand in order to lessen the chances of robbery.)

The estimated sales and purchases for December, January, and February are shown below. Purchases during November amounted to \$140,000.

	Sales	Purchases
December	\$160,000	\$40,000
January	40,000	40,000
February	60,000	40,000

- Prepare a cash budget for December, January, and February.
- Now suppose that Koehl starts selling on a credit basis on December 1, giving customers 30 days to pay. All customers accept these terms, and all other facts in the problem are unchanged. What would the company's loan requirements be at the end of December in this case? (*Hint:* The calculations required to answer this question are minimal.)

**(16–15)** Suppose a firm makes purchases of \$3.65 million per year under terms of 2/10, net 30, and takes discounts.  
Cash Discounts

- What is the average amount of accounts payable net of discounts? (Assume the \$3.65 million of purchases is net of discounts—that is, gross purchases are \$3,724,489.80, discounts are \$74,489.80, and net purchases are \$3.65 million.)
- Is there a cost of the trade credit the firm uses?
- If the firm did not take discounts but did pay on the due date, what would be its average payables and the cost of this nonfree trade credit?
- What would be the firm's cost of not taking discounts if it could stretch its payments to 40 days?

**(16–16)** The Thompson Corporation projects an increase in sales from \$1.5 million to \$2 million, but it needs an additional \$300,000 of current assets to support this expansion. Thompson can finance the expansion by no longer taking discounts, thus increasing accounts payable. Thompson purchases under terms of 2/10, net 30, but it can delay payment for an additional 35 days—paying in 65 days and thus becoming 35 days past due—without a penalty because its suppliers currently have excess capacity. What is the effective, or equivalent, annual cost of the trade credit?  
Trade Credit

**(16–17)** The Raattama Corporation had sales of \$3.5 million last year, and it earned a 5% return (after taxes) on sales. Recently, the company has fallen behind in its accounts payable. Although its terms of purchase are net 30 days, its accounts payable represent 60 days' purchases. The company's treasurer is seeking to increase bank borrowings in order to become current in meeting its trade obligations (that is, to have 30 days' payables outstanding). The company's balance sheet is as follows (in thousands of dollars):  
Bank Financing

Cash	\$ 100	Accounts payable	\$ 600
Accounts receivable	300	Bank loans	700
Inventory	<u>1,400</u>	Accruals	<u>200</u>
Current assets	\$1,800	Current liabilities	\$1,500
Land and buildings	600	Mortgage on real estate	700
Equipment	600	Common stock, \$0.10 par	300
		Retained earnings	<u>500</u>
Total assets	<u><u>\$3,000</u></u>	Total liabilities and equity	<u><u>\$3,000</u></u>

- How much bank financing is needed to eliminate the past-due accounts payable?
- Assume that the bank will lend the firm the amount calculated in part a. The terms of the loan offered are 8%, simple interest, and the bank uses a 360-day year for the interest calculation. What is the interest charge for one month? (Assume there are 30 days in a month.)
- Now ignore part b and assume that the bank will lend the firm the amount calculated in part a. The terms of the loan are 7.5%, add-on interest, to be repaid in 12 monthly installments.
  - What is the total loan amount?
  - What are the monthly installments?
  - What is the APR of the loan?
  - What is the effective rate of the loan?
- Would you, as a bank loan officer, make this loan? Why or why not?

## SPREADSHEET PROBLEM

(16-18)

Build a Model: Cash Budgeting



resource

Start with the partial model in the file *Ch16 P18 Build a Model.xls* on the textbook's Web site. Helen Bowers, owner of Helen's Fashion Designs, is planning to request a line of credit from her bank. She has prepared the following sales forecasts for parts of 2011 and 2012:

	Sales	Labor and Raw Materials
May 2011	\$180,000	\$ 90,000
June	180,000	90,000
July	360,000	126,000
August	540,000	882,000
September	720,000	306,000
October	360,000	234,000
November	360,000	162,000
December	90,000	90,000
January 2012	180,000	NA

Estimates obtained from the credit and collection department are as follows: collections within the month of sale, 10%; collections during the month following the sale, 75%; collections the second month following the sale, 15%. Payments for labor and raw materials are typically made during the month following the one in which these costs were incurred. Total costs for labor and raw materials are estimated for each month as shown in the table.

General and administrative salaries will amount to approximately \$27,000 a month; lease payments under long-term lease contracts will be \$9,000 a month; depreciation charges will be \$36,000 a month; miscellaneous expenses will be \$2,700 a month; income tax payments of \$63,000 will be due in both September and December; and a progress payment of \$180,000 on a new design studio must be paid in October. Cash on hand on July 1 will amount to \$132,000, and a minimum cash balance of \$90,000 will be maintained throughout the cash budget period.

- Prepare a monthly cash budget for the last 6 months of 2011.
- Prepare an estimate of the required financing (or excess funds)—that is, the amount of money Bowers will need to borrow (or will have available to invest)—for each month during that period.

- c. Assume that receipts from sales come in uniformly during the month (i.e., cash receipts come in at the rate of 1/30 each day) but that all outflows are paid on the 5th of the month. Will this have an effect on the cash budget—in other words, would the cash budget you have prepared be valid under these assumptions? If not, what can be done to make a valid estimate of peak financing requirements? No calculations are required, although calculations can be used to illustrate the effects.
- d. Bowers produces on a seasonal basis, just ahead of sales. Without making any calculations, discuss how the company's current ratio and debt ratio would vary during the year assuming all financial requirements were met by short-term bank loans. Could changes in these ratios affect the firm's ability to obtain bank credit?
- e. If its customers began to pay late, this would slow down collections and thus increase the required loan amount. Also, if sales dropped off, this would have an effect on the required loan amount. Perform a sensitivity analysis that shows the effects of these two factors on the maximum loan requirement.

## Mini Case

Dan Barnes, financial manager of Ski Equipment Inc. (SKI), is excited but apprehensive. The company's founder recently sold his 51% controlling block of stock to Kent Koren, who is a big fan of EVA (Economic Value Added). EVA is found by taking the net operating profit after taxes (NOPAT) and then subtracting the dollar cost of all the capital the firm uses:

$$\begin{aligned} \text{EVA} &= \text{NOPAT} - \text{Capital costs} \\ &= \text{EBIT}(1 - T) - \text{WACC}(\text{Total capital employed}) \end{aligned}$$

If EVA is positive then the firm's management is creating value. On the other hand, if EVA is negative, then the firm is not covering its cost of capital and stockholders' value is being eroded. Koren rewards managers handsomely if they create value, but those whose operations produce negative EVAs are soon looking for work. Koren frequently points out that if a company could generate its current level of sales with fewer assets, it would need less capital. This would, other things held constant, lower capital costs and increase its EVA.

Shortly after taking control of SKI, Kent Koren met with SKI's senior executives to tell them of his plans for the company. First, he presented some EVA data that convinced everyone that SKI had not been creating value in recent years. He then stated, in no uncertain terms, that this situation must change. He noted that SKI's designs of skis, boots, and clothing are acclaimed throughout the industry but claimed that something was seriously amiss elsewhere in the company. Costs are too high, prices are too low, or the company employs too much capital, and Koren wants SKI's managers to correct the problem—or else.

Barnes has long felt that SKI's working capital situation should be studied. The company may have the optimal amounts of cash, securities, receivables, and inventories, but it may also have too much or too little of these items. In the past, the production manager resisted Barnes's efforts to question his holdings of raw materials, the marketing manager resisted questions about finished goods, the sales staff resisted questions about credit policy (which affects accounts receivable), and the treasurer did not want to talk about her cash and securities balances. Koren's speech made it clear that such resistance would no longer be tolerated.

Barnes also knows that decisions about working capital cannot be made in a vacuum. For example, if inventories could be lowered without adversely affecting operations, then less capital would be required, the dollar cost of capital would decline, and EVA would increase. However, lower raw materials inventories might lead to production slowdowns and higher costs, and lower finished goods inventories might lead to the loss of profitable sales. So, before inventories are changed, it will be necessary to study operating as well as financial effects. The situation is the same with regard to cash and receivables. Barnes begins by collecting the ratios shown below. (The partial cash budget shown after the ratios is used later in this mini case.)

	SKI	Industry
Current	1.75	2.25
Quick	0.92	1.16
Total liabilities/assets	58.76%	50.00%
Turnover of cash and securities	16.67	22.22
Days sales outstanding (365-day basis)	45.63	32.00
Inventory turnover	6.00	8.00
Fixed assets turnover	7.75	13.220
Total assets turnover	2.08	3.00
Profit margin on sales	2.07%	3.50%
Return on equity (ROE)	10.45%	21.00%
Payables deferral period	30.00	33.00

*Cash Budget  
(Thousands of Dollars)*

	Nov	Dec	Jan	Feb	Mar	Apr
<b>Sales Forecast</b>						
(1) Sales (gross)	\$71,218.00	\$68,212.00	\$65,213.00	\$52,475.00	\$42,909.00	\$30,524.00
<b>Collections</b>						
(2) During month of sale: (0.2)(0.98)(month's sales)			12,781.75	10,285.10		
(3) During first month after sale: (0.7)(previous month's sales)			47,748.40	45,649.10		
(4) During second month after sale: (0.1)(sales 2 months ago)			<u>7,121.80</u>	<u>6,821.20</u>		
(5) Total collections (Lines 2 + 3 + 4)			<u>\$67,651.95</u>	<u>\$62,755.40</u>		
<b>Purchases</b>						
(6) (0.85)(forecasted sales 2 months from now)		\$44,603.75	\$36,472.65	\$25,945.40		
<b>Payments</b>						
(7) Payments (1-month lag)			44,603.75	36,472.65		
(8) Wages and salaries			6,690.56	5,470.90		
(9) Rent			<u>2,500.00</u>	<u>2,500.00</u>		
(10) Taxes						
(11) Total payments			<u>\$53,794.31</u>	<u>\$44,443.55</u>		
<b>NCFs</b>						
(12) Cash on hand at start of forecast			\$ 3,000.00			
(13) NCF: Coll. – Pmts. = Line 5 – Line 11			<u>\$13,857.64</u>	<u>\$18,311.85</u>		
(14) Cum NCF: Prior + this mos. NCF			<u>\$16,857.64</u>	<u>\$ 35,169.49</u>		
<b>Cash Surplus (or Loan Requirement)</b>						
(15) Target cash balance			<u>1,500.00</u>	<u>1,500.00</u>		
(16) Surplus cash or loan needed			<u>\$15,357.64</u>	<u>\$33,669.49</u>		

- a. Barnes plans to use the preceding ratios as the starting point for discussions with SKI's operating executives. He wants everyone to think about the pros and cons of changing each type of current asset and how changes would interact to affect profits and EVA. Based on the data, does SKI seem to be following a relaxed, moderate, or restricted working capital policy?
- b. How can one distinguish between a relaxed but rational working capital policy and a situation in which a firm simply has excessive current assets because it is inefficient? Does SKI's working capital policy seem appropriate?
- c. Calculate the firm's cash conversion cycle given that annual sales are \$660,000 and cost of goods sold represents 90% of sales. Assume a 365-day year.
- d. What might SKI do to reduce its cash without harming operations? In an attempt to better understand SKI's cash position, Barnes developed a cash budget. Data for the first 2 months of the year are shown above. (Note that Barnes's preliminary cash budget does not account for interest income or interest expense.) He has the figures for the other months, but they are not shown.
- e. Should depreciation expense be explicitly included in the cash budget? Why or why not?
- f. In his preliminary cash budget, Barnes has assumed that all sales are collected and thus that SKI has no bad debts. Is this realistic? If not, how would bad debts be dealt with in a cash budgeting sense? (*Hint*: Bad debts will affect collections but not purchases.)
- g. Barnes's cash budget for the entire year, although not given here, is based heavily on his forecast for monthly sales. Sales are expected to be extremely low between May and September but then to increase dramatically in the fall and winter. November is typically the firm's best month, when SKI ships equipment to retailers for the holiday season. Barnes's forecasted cash budget indicates that the company's cash holdings will exceed the targeted cash balance every month except for October and November, when shipments will be high but collections will not be coming in until later. Based on the ratios shown earlier, does it appear that SKI's target cash balance is appropriate? In addition to possibly lowering the target cash balance, what actions might SKI take to better improve its cash management policies, and how might that affect its EVA?
- h. What reasons might SKI have for maintaining a relatively high amount of cash?
- i. Is there any reason to think that SKI may be holding too much inventory? If so, how would that affect EVA and ROE?
- j. If the company reduces its inventory without adversely affecting sales, what effect should this have on the company's cash position (1) in the short run and (2) in the long run? Explain in terms of the cash budget and the balance sheet.
- k. Barnes knows that SKI sells on the same credit terms as other firms in its industry. Use the ratios presented earlier to explain whether SKI's customers pay more or less promptly than those of its competitors. If there are differences, does that suggest SKI should tighten or loosen its credit policy? What four variables make up a firm's credit policy, and in what direction should each be changed by SKI?
- l. Does SKI face any risks if it tightens its credit policy?
- m. If the company reduces its DSO without seriously affecting sales, what effect would this have on its cash position (1) in the short run and (2) in the long run? Answer in terms of the cash budget and the balance sheet. What effect should this have on EVA in the long run?

In addition to improving the management of its current assets, SKI is also reviewing the ways in which it finances its current assets. With this concern in mind, Barnes is also trying to answer the following questions.

- n. Is it likely that SKI could make significantly greater use of accruals?
- o. Assume that SKI purchases \$200,000 (net of discounts) of materials on terms of 1/10, net 30, but that it can get away with paying on the 40th day if it chooses not to take discounts. How much free trade credit can the company get from its equipment supplier, how much costly trade credit can it get, and what is the nominal annual interest rate of the costly credit? Should SKI take discounts?
- p. SKI tries to match the maturity of its assets and liabilities. Describe how SKI could adopt either a more aggressive or a more conservative financing policy.
- q. What are the advantages and disadvantages of using short-term debt as a source of financing?
- r. Would it be feasible for SKI to finance with commercial paper?

### SELECTED ADDITIONAL CASES

*The following cases from Textchoice, Cengage Learning's online case library, cover many of the concepts discussed in this chapter and are available at <http://www.textchoice2.com>.*

**Klein-Brigham Series:**

Case 29, "Office Mates, Inc.," which illustrates how changes in current asset policy affect expected profitability and risk; Case 32, "Alpine Wear, Inc.," which illustrates the mechanics of the cash budget and the rationale behind its use; Case 50, "Toy World, Inc.," and Case 66, "Sorenson Stove Company," which deal with cash budgeting; Case 33, "Upscale Toddlers, Inc.," which deals with credit policy changes; and Case 34, "Texas Rose Company," which focuses on receivables management.

**Brigham-Buzzard Series:**

Case 11, "Powerline Network Corporation (Working Capital Management)."