

WORKING CAPITAL AND FINANCIAL PLANNING

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CHAPTER
16

WORKING CAPITAL MANAGEMENT

Best Buy Successfully Manages Its Working Capital

Best Buy Company, North America's largest consumer electronics retailer, operates Best Buy and Musicland stores. Its stock price sold for \$67 in June 2005, up from \$20 three years earlier.¹ This success stemmed from sound financial and operating practices, especially its working capital management, the focus of this chapter.

Working capital management involves finding the optimal levels for cash, marketable securities, accounts receivable, and inventory and then financing those assets in the least-cost manner. Most of Best Buy's customers use credit cards, so neither in-store cash nor accounts receivable is significant. Therefore, Best Buy's working capital policy focuses on its inventories. To maintain sales, stores must be well stocked with the goods customers are seeking at the time. This involves determining what new products are coming out, where they can be obtained at the lowest cost, and then delivering them to stores in a timely manner.

Dramatic improvements in communications and computer technology have transformed the way Best Buy manages its inventories. It now collects real-time data from each store on how each product is selling, and its computers place orders automatically to keep the shelves full. Moreover, if sales of an item are slipping, prices are lowered to reduce stocks of that item before the situation gets out of hand and steeper price cuts become necessary. After studying this chapter, you should have a good understanding of how working capital management affects profits and stock prices.

Best Buy Company

Putting Things In Perspective

About 60 percent of a typical financial manager's time is devoted to working capital, and many students' first jobs focus on working capital. This is particularly true in smaller businesses, where most new jobs in the United States are being created.

¹ Later in 2005, Best Buy announced a two-for-one stock split.

Working capital policy involves two basic questions: (1) What is the optimal amount of each type of current asset for the firm to carry and (2) how should current asset holdings be financed? This chapter addresses these issues.

16.1 WORKING CAPITAL TERMINOLOGY

The term *working capital* originated with the old Yankee peddler, who would load up his wagon and then go off to peddle his wares. The merchandise was called “working capital” because it was what he actually sold, or “turned over,” to produce his profits. The wagon and horse were his fixed assets. He generally owned the horse and wagon, so they were financed with “equity” capital, but he bought his merchandise on credit (that is, by borrowing from his supplier) or with money borrowed from a bank. Those loans were called *working capital loans*, and they had to be repaid after each trip to demonstrate to the lender that the credit was sound. Once the peddler repaid the loan, he could take out another loan, and lenders that followed this procedure were said to be employing “sound lending practices.” Obviously, the more trips the peddler took per year, the faster his working capital turnover and the greater his profits.

This concept can be applied to modern businesses, as we demonstrate here. We begin our discussion with a review of some basic definitions and concepts:

1. **Working capital**, sometimes called *gross working capital*, simply refers to current assets used in operations.
2. **Net working capital** is defined as current assets minus *all* current liabilities.
3. **Net operating working capital** is defined as current assets minus non-interest-bearing current liabilities (accounts payable and accruals).²
4. The **cash conversion cycle (CCC)** is the length of time funds are tied up in working capital, or the length of time between paying for working capital and collecting cash from the sale of the working capital. We discuss the CCC in the next section.



How did the term working capital originate?

Differentiate between net working capital and net operating working capital.

16.2 THE CASH CONVERSION CYCLE

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

Working Capital

All short-term, or current, assets—cash, marketable securities, inventories, and accounts receivable.

Net Working Capital

Current assets minus all current liabilities.

Net Operating Working Capital

Current assets minus non-interest-bearing current liabilities.

Cash Conversion Cycle

The length of time funds are tied up in working capital, or the length of time between paying for working capital and collecting cash from the sale of the working capital.

² This definition assumes that cash and marketable securities on the balance sheet are at their normal long-run target levels and that the company is not holding any excess cash. Excess holdings of cash and marketable securities are generally not included as part of net operating working capital.

Calculating the Targeted CCC

Great Fashions Inc. (GFI) is just starting in business, buying ladies golf outfits from a manufacturer in China and selling them through pro shops at high-end golf clubs. Its business plan calls for it to purchase \$100,000 of merchandise at the start of each month and have it sold after 60 days. The company will have 40 days to pay its suppliers, and it will give its customers 60 days to pay for their purchases. GFI also expects monthly sales of \$100,000, which means that it will just break even during its first few years. Any funds required to support operations will be obtained from the bank, and those loans must be repaid as soon as cash is available.

This information can be used to calculate GFI's cash conversion cycle, which nets out the three time periods described here:³

Inventory Conversion Period

The average time required to convert raw materials into finished goods and then to sell them.

Average Collection Period (ACP)

The average length of time required to convert the firm's receivables into cash, that is, to collect cash following a sale.

Payables Deferral Period

The average length of time between the purchase of materials and labor and the payment of cash for them.

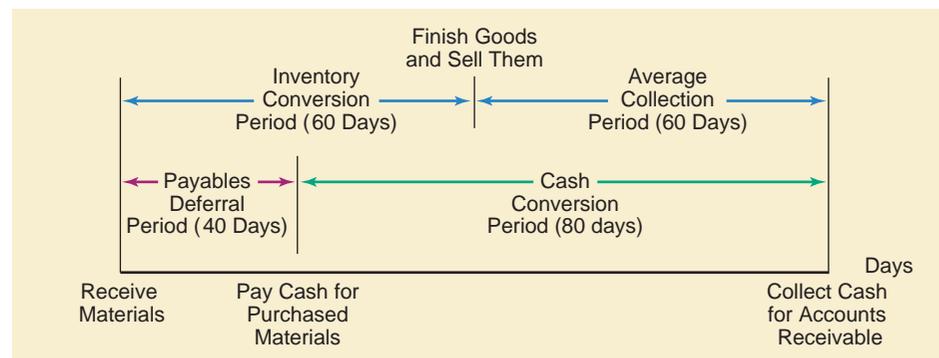
- 1. Inventory conversion period.** For GFI, this is the 60 days it takes to sell the merchandise.⁴
- 2. Average collection period (ACP).** This is the length of time customers are given to pay for goods following a sale. The ACP is also called the days' sales outstanding (DSO). GFI's business plan calls for an ACP of 60 days, which is consistent with its 60-day credit terms.
- 3. Payables deferral period.** This is the length of time GFI's suppliers give it to pay for its purchases, 40 days in our example.

On Day 1 GFI buys merchandise, and it expects to sell the goods and thus convert them to accounts receivable in 60 days. It should take another 60 days to collect the receivables, making a total of 120 days between receiving merchandise and collecting cash. However, GFI is able to defer its own payments for 40 days.

We combine these three periods to find the planned cash conversion cycle, shown below as an equation and in Figure 16-1 as a picture.

$$\begin{array}{rcccccc}
 \text{Inventory} & & \text{Average} & & \text{Payables} & & \text{Cash} \\
 \text{conversion} & + & \text{collection} & - & \text{deferral} & = & \text{conversion} \\
 \text{period} & & \text{period} & & \text{period} & & \text{cycle} \\
 60 & + & 60 & - & 40 & = & 80 \text{ days}
 \end{array} \quad (16-1)$$

FIGURE 16-1 The Cash Conversion Cycle



³ See Verlyn D. Richards and Eugene J. Laughlin, "A Cash Conversion Cycle Approach to Liquidity Analysis," *Financial Management*, Spring 1980, pp. 32–38.

⁴ If GFI 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.

Although GFI must pay \$100,000 to its suppliers after 40 days, it will not receive any cash until $60 + 60 = 120$ days into the cycle. Therefore, it will have to borrow the \$100,000 cost of the merchandise from its bank on Day 40, and it will not be able to repay the loan until it collects on Day 120. Thus, for $120 - 40 = 80$ days—which is the CCC—it will owe the bank \$100,000 and will be paying interest on this debt. The shorter the cash conversion cycle the better because that will lower interest charges.

Note that if GFI 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 interest charges would be reduced, and its profits and stock price would be improved.

Calculating the Actual CCC

The preceding section illustrates the CCC concept, but in practice we would actually calculate the CCC based on the firm's financial statements. Moreover, the actual CCC would almost certainly differ from the theoretically forecasted value because of such real-world complexities as shipping delays, sales slow-downs, and customer delays in making payments. Moreover, a firm such as GFI would start 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 GFI has been in business for several years and is now in a stable position—placing orders, making sales, getting collections, and making payments on a recurring basis. The following data were taken from its latest financial statements:

Annual sales	\$1,216,666
Cost of goods sold	1,013,889
Inventories	250,000
Accounts receivable	300,000
Accounts payable	150,000

We begin with the inventory conversion period, and show its calculation for GFI:

$$\begin{aligned} \text{Inventory conversion period} &= \frac{\text{Inventory}}{\text{Cost of goods sold per day}} \quad (16-2) \\ &= \frac{\$250,000}{\$1,013,889/365} = 90 \text{ days} \end{aligned}$$

Thus, it takes GFI an average of 90 days to sell its merchandise, not the 60 days called for in the business plan. Note also that inventory is carried at cost, so the denominator of the equation should be the cost of goods sold, not sales.

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

$$\begin{aligned} \text{Average collection period} &= \text{ACP (or DSO)} = \frac{\text{Receivables}}{\text{Sales}/365} \quad (16-3) \\ &= \frac{\$300,000}{\$1,216,666/365} = 90 \text{ days} \end{aligned}$$

Thus, it takes GFI 90 days after a sale to receive cash, not the 60 days called for in the business plan. Because receivables are recorded at the sales price, we use sales rather than the cost of goods sold in the denominator.

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, not uses it.

To grow, most companies need cash for working capital. However, if the CCC is negative, then (again) growth in sales *provides* cash rather than *uses* it. This cash can be invested in plant and equipment as well as research and development, thus further increasing growth and leading to even more cash generation. Analysts recognize this point when they value Dell and Amazon, and it benefits their stock prices.

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

$$\begin{aligned} \text{Payables deferral period} &= \frac{\text{Payables}}{\text{Purchases per day}} = \frac{\text{Payables}}{\text{Cost of goods sold}/365} \quad (16-4) \\ &= \frac{\$150,000}{\$1,013,889/365} \\ &= 54 \text{ days} \end{aligned}$$

GFI is supposed to pay its suppliers after 40 days, but it is actually a slow payer, delaying payment until Day 54.

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

$$\text{Cash conversion cycle (CCC)} = 90 \text{ days} + 90 \text{ days} - 54 \text{ days} = 126 \text{ days}$$

GFI's actual 126-day CCC is quite different from the planned 80 days. It takes longer than planned to sell merchandise, customers don't pay as fast as they should, and GFI itself pays suppliers slower than it should. The end result is a CCC of 126 days versus the planned 80 days.

If the planned 80-day CCC is "reasonable," then the actual 126 days is way too high. The CFO should push the sales and credit personnel to speed up sales and collections. Also, the purchasing department should seek longer payment terms. If GFI could take these steps without hurting sales and operating costs, this would help its profits and the stock price.

Two professors, Hyun-Han Shin and Luc Soenen, studied more than 2,900 companies over a 20-year period, and they found that shortening the cash conversion cycle results in higher profits and better stock price performances.⁵ This demonstrates that good working capital management is important.

⁵ See Hyun-Han Shin and Luc Soenen, "Efficiency of Working Capital Management and Corporate Profitability," *Financial Practice and Education*, Fall/Winter 1998, pp. 37-45.



Define the following terms: inventory conversion period, average collection period, and payables deferral period. Explain how these terms are used to form the cash conversion cycle.

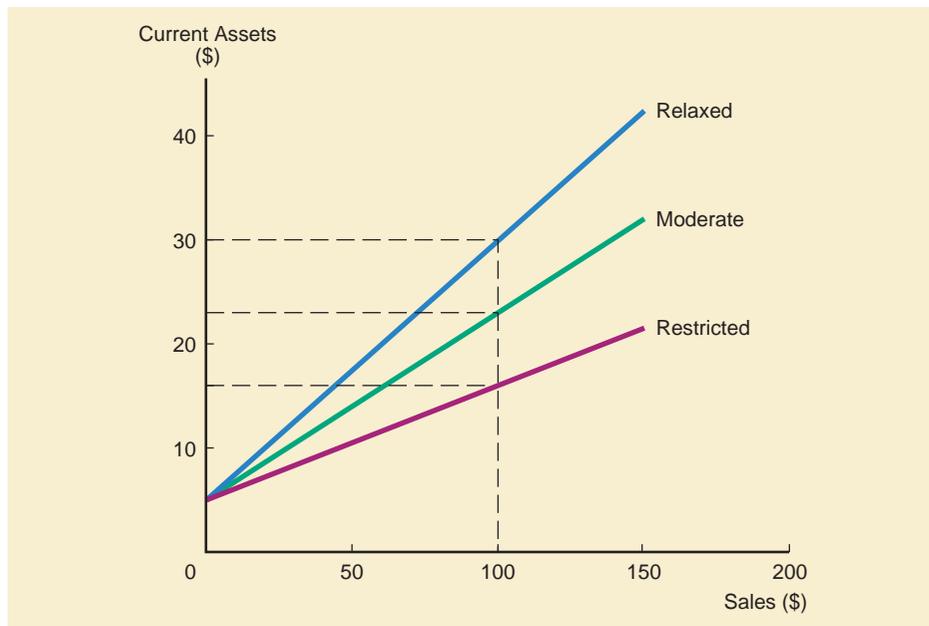
How would a reduction in the cash conversion cycle increase profitability?

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

16.3 ALTERNATIVE CURRENT ASSET INVESTMENT POLICIES

The cash conversion cycle highlights the strengths and weaknesses of the company's working capital policy. In this section, we explain how the amount of current assets held affects profitability. To begin, Figure 16-2 shows three alternative policies regarding the size of current asset holdings. The top line has the steepest slope and shows that the firm holds a lot of cash, marketable securities, and inventories relative to its sales, and it has a liberal credit policy that results in a

FIGURE 16-2 Alternative 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

Note: The sales/current assets relationship is shown here as being linear, but the relationship could be curvilinear.

Relaxed Current Asset Investment Policy

Relatively large amounts of cash, marketable securities, and inventories are carried, and a liberal credit policy results in a high level of receivables.

Restricted Current Asset Policy

Holdings of cash, marketable securities, inventories, and receivables are constrained.

Moderate Current Asset Policy

Between the relaxed and restricted policies.

high level of accounts receivable. This is a **relaxed** (or “fat cat”) **policy**. On the other hand, with a **restricted** (or “lean-and-mean”) **policy**, holdings of current assets are minimized. The **moderate policy** lies between the two extremes.

We can use the Du Pont equation to evaluate working capital management’s effects on ROE.

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

A restricted, lean-and-mean policy means a low level of assets, hence a high total asset turnover ratio, which results in a high expected ROE. However, this policy also exposes the firm to risks, because shortages can lead to work stoppages, unhappy customers, and serious long-run problems. The relaxed policy minimizes operating problems but results in a low turnover, which lowers ROE. The moderate policy falls between the two extremes. The optimal strategy is the one that maximizes 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 installed systems under which bar codes on all merchandise are read at the cash register. This information is transmitted electronically to a computer that records the stock of each item, and the computer automatically places an order with the supplier’s computer when the stock falls to a prescribed level. This process lowers the “safety stocks” that would otherwise be necessary to avoid running out of stock, which lowers inventories to optimal, profit-maximizing levels.



Identify and explain three alternative current asset investment policies.

Use the Du Pont equation to show how working capital policy affects the expected ROE.

16.4 ALTERNATIVE CURRENT ASSET FINANCING POLICIES

Investments in 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 these sources has advantages and disadvantages, so each firm must decide which sources are best for it.

To begin our discussion, 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, hence they build up current assets at those times but let inventories and receivables fall when the economy slackens. Note, though, that current assets rarely drop to zero—companies maintain some **permanent current assets**, which are the current assets needed at the low point of the cycle. Then, as sales increase during the upswing, current assets are increased, and these extra current assets are defined as **temporary current assets**. The way these current assets are financed is called the firm’s **current asset financing policy**.

Permanent Current Assets

Current assets that a firm must carry even at the trough of its cycles.

Temporary Current Assets

Current assets that fluctuate with seasonal or cyclical variations in sales.

Current Asset Financing Policy

The way current assets are financed.

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 16-3. 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) There is uncertainty about the lives of assets. For example, a firm might finance inventories with a 30-day bank loan, expecting to sell the inventories and then 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 asset and liability maturities, this is defined as a *moderate current asset financing policy*.

Maturity Matching, or “Self-Liquidating,” Approach

A financing policy that matches asset and liability maturities. This is a moderate policy.

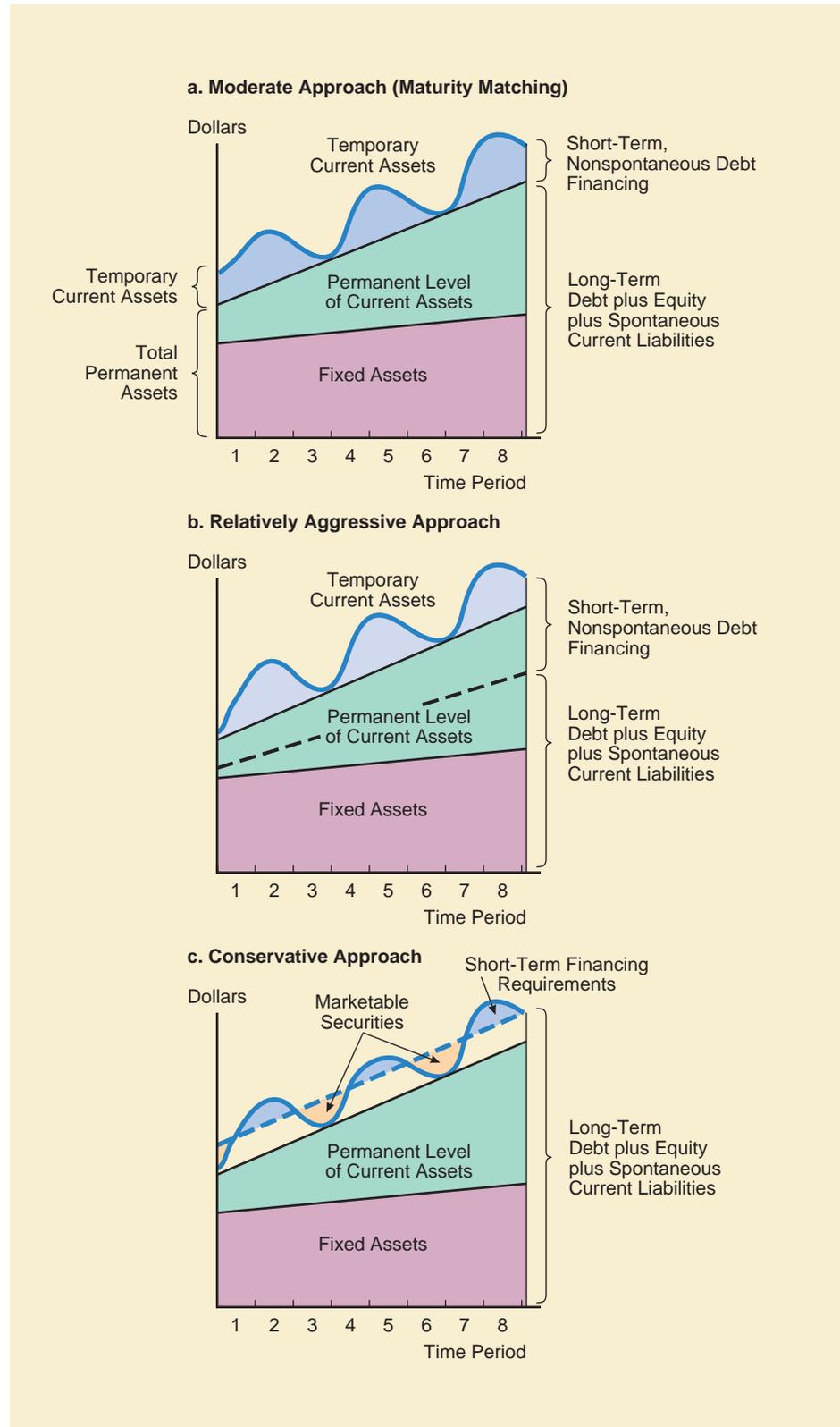
Aggressive Approach

Panel b of Figure 16-3 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 would be a highly aggressive, extremely nonconservative position, and the firm would be very much 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 sacrifice safety for the chance of higher profits.

The reason for adopting the aggressive policy is to take advantage of the fact that the yield curve is generally upward sloping, hence short-term rates are generally lower than long-term rates. However, a strategy of financing long-term assets with short-term debt is really quite risky. To illustrate, suppose a company borrows \$1 million on a one-year basis and uses the funds to buy machinery that will lower labor costs by \$200,000 per year for 10 years. 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 company encountered temporary financial problems, the lender might refuse to renew the loan, and that could lead to bankruptcy. Had the firm matched maturities and financed the plant with a 10-year loan, the required loan payments would have been better matched with the cash flows, and the renewal problem would not have arisen.

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 the permanent assets and also to meet some of the 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 financing, while the troughs below the dashed line represent short-term security holdings. This is a very safe, conservative financing policy.

FIGURE 16-3 Alternative Current Asset Financing Policies


Choosing between 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, its interest costs will be relatively stable over time, but if it uses short-term credit, its interest expense can fluctuate widely, perhaps going so high that profits are extinguished. (2) If a firm borrows heavily on a short-term basis, a temporary recession may adversely affect its financial ratios and render it unable to repay this debt. Recognizing this point, if the borrower's financial position is weak, the lender may not renew the loan, which could force the borrower into bankruptcy.

Note too that *short-term loans can generally be negotiated much faster* than long-term loans. Lenders need to make a more 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 may offer greater flexibility*. If the firm thinks that interest rates are abnormally high, it may prefer short-term credit to gain flexibility in changing the debt contract. Also, if its needs for funds are seasonal or cyclical, it may not want to commit itself to long-term debt because, while provisions for repaying long-term debt can be built into the contract, prepayment penalties are generally built into long-term debt contracts to permit the lender to recover its setup costs. 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.

All things considered, it is not possible to state that either long-term or short-term financing is better than the other. The firm's specific conditions will affect the choice, as will the preferences of managers. Optimistic and/or aggressive managers will probably lean more toward short-term credit to gain an interest cost advantage, while 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 judgments.

Up until this point, we have provided a brief overview of how companies may go about establishing their working capital policy. Next, we discuss how companies can manage their various current assets and current liabilities in a way that is consistent with their overall policy. We begin by showing how to put together a simple cash budget, after which we discuss briefly the management of each of the major components of current assets and current liabilities.



Differentiate between permanent current assets and temporary current assets.

What does maturity matching mean, and what is the advantage of this policy?

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

16.5 THE CASH BUDGET

Firms need to forecast their cash flows. If they will need additional cash, they should line up funds well in advance, while if they will generate surplus cash, they should plan for its productive use. The primary forecasting tool is the

Cash Budget

A table that shows cash receipts, disbursements, and balances over some period.

cash budget, illustrated in Table 16-1, which is a printout from the chapter's *Excel* model.⁶

Cash budgets can be of any length, but firms typically develop a monthly cash budget like Table 16-1 for the coming year and a daily cash budget at the start of each month. The monthly budget is good for long-range planning, while the daily budget gives a more precise picture of the actual cash flows.

The monthly cash budget begins with a forecast of sales for each month and a projection of when collections will occur. Then comes a forecast of materials purchases, followed by forecasted payments for materials, labor, leases, new equipment, taxes, and other expenses. When the 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 beginning cash balance, and the result is the amount of cash the firm would have on hand at the end of the month if it neither borrowed nor invested.

We use Allied Foods to illustrate cash budgets. To shorten the example, we only deal with the last half of 2006. Allied sells mainly to grocery chains, and its projected 2006 sales are \$3,300 million. As Table 16-1 shows, sales increase during the summer, peak in September, and then decline during the fall. All sales are on terms of 2/10, net 30, meaning that a 2 percent discount is allowed if payment is made within 10 days but if the discount is not taken, the full amount is due in 30 days. However, like most companies, Allied finds that some customers pay late. Experience shows that 20 percent of customers pay during the month of the sale—these are the discount customers, 70 percent pay during the month immediately following the sale, and 10 percent are late, paying in the second month after the sale.⁷

The costs to Allied of foodstuffs, spices, preservatives, and packaging materials average 70 percent of sales revenues. Purchases are generally made one month before the firm expects to sell the finished products, but Allied's suppliers allow it to delay payments for 30 days. July sales are forecasted at \$300 million, so purchases during June should amount to \$210 million, and this amount must be paid in July.

Wages and lease payments are also built into the cash budget, as are Allied's estimated tax payments, \$30 million due September 15 and \$20 million due December 15. Also, a \$100 million payment for a new plant must be made in October, and miscellaneous other required payments are shown in the budget. Allied's **target cash balance** is \$10 million, and it plans either to borrow to achieve this target or to invest it if it generates more cash than is needed.

We use this information in Table 16-1 to forecast monthly cash surpluses or shortfalls for the period from July through December, along with the amount Allied will need to borrow or will have to invest so as to keep the end-of-month cash balance at the target level.

Inputs used in the forecast—which are really assumptions that may not be correct—are given on Rows 6 through 16. These values are used in the calculations shown here. Row 19 gives the sales forecast for the period May through

Target Cash Balance

The desired cash balance that a firm plans to maintain in order to conduct business.

⁶ For a better understanding of working capital management, go through the *Excel* chapter model while reading through the text to see how spreadsheets can streamline the working capital analysis process.

⁷ A negligible percentage of sales results in bad debts. The low bad debt losses result from Allied's careful screening of customers and its generally tight credit policies. However, the cash budget model can show the effects of bad debts, so Allied's CFO could show top management how cash flows would be affected if the firm relaxed its credit policy in order to stimulate sales.

TABLE 16-1

Allied Food Products: 2006 Cash Budget (Millions of Dollars)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	
6	Selected Input Data														
7	Collections during month of sale						20%	Assumed constant. Don't change.							
8	Collections during 1st month after sale						70%	Assumed constant. Don't change.							
9	Collections during 2nd month after sale						10%	Fixed at 10% less bad debt %							
10	Percent bad debts						0%	Can change to see effects							
11	Discount on first month collections						2%	Can change to see effects							
12	Purchases as a % of next month's sales						70%	Can change to see effects							
13	Lease payments per month						\$15	Can change to see effects							
14	Construction cost for new plant (Oct)						\$100	Can change to see effects							
15	Target cash balance						\$10	Will borrow this amount at start							
16	Sales adjustment factor						0%	(% increase or decrease from base)							
17															
18															
19	Sales (gross)														
								May	June	July	August	Sept	Oct	Nov	Dec
								\$200	\$250	\$300	\$400	\$500	\$350	\$250	\$200
20	Collections														
21	During month of sale: 0.2(Sales)(0.98)									\$59	\$78	\$98	\$69	\$49	\$39
22	During 1st month after sale: 0.7(prior month's sales)									175	210	280	350	245	175
23	During 2nd month after sale: 0.1 (sales 2 months ago)									20	25	30	40	50	35
24	Total collections									\$254	\$313	\$408	\$459	\$344	\$249
25	Payments														
26	Purchases: 70% of next month's sales							\$210	\$280	\$350	\$245	\$175	\$140		
27	Payment for materials: Last month's purchases								\$210	\$280	\$350	\$245	\$175	\$140	
28	Wages and salaries								30	40	50	40	30	30	
29	Lease payments								15	15	15	15	15	15	
30	Other expenses								10	15	20	15	10	10	
31	Taxes										30			20	
32	Payment for plant construction											\$100			
33	Total payments									\$265	\$350	\$465	\$415	\$230	\$215
34	Net cash flows														
35	Net cash inflow (NCF) for month: Row 24 minus Row 33									(\$11)	(\$37)	(\$57)	\$44	\$114	\$34
36	Cumulative NCF: Month's NCF plus prior month's cumulative NCF									(\$11)	(\$48)	(\$105)	(\$61)	\$53	\$87
37	Cash surplus (or loan requirement)														
38	Target cash balance									\$10	\$10	\$10	\$10	\$10	\$10
39	Surplus cash (or loan needed): Row 36 - Row 38									(\$21)	(\$58)	(\$115)	(\$71)	\$43	\$77
40	Maximum required loan (shown as a negative)									(\$115)					
41	Maximum available for investment									\$77					

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 \$21 million borrowed during July would likely be taken down on a daily basis, as needed, and during October the \$115 million loan that existed at the beginning of the month would be reduced daily to the \$71 million ending balance, which, in turn, would be completely paid off sometime during November.

December. May and June sales are needed to determine collections for July and August. Rows 20 through 24 relate to collections. Row 21 shows that 20 percent of the sales during any given month are collected during that month. However, customers who pay in the first month take the discount, so collections for that month are reduced by 2 percent. For example, collections for July are calculated as 20 percent of the \$300 million sales for that month, minus the 2 percent

discount, or $0.2(\$300) - 0.2(\$300)(0.02) = \$58.8$ million, rounded to \$59 million. Row 22 shows the collections for the previous month's sales. For example, in July, 70 percent of the \$250 million June sales, or \$175 million, should be collected. Row 23 shows collections from sales two months earlier. Thus, in July collections for May sales should be $(0.10)(\$200) = \20 million. The collections during each month are summed and shown on Row 24. Thus, the July collections include 20 percent of July sales (minus the discount), 70 percent of June sales, plus 10 percent of May sales, or \$254 million in total.

Raw material costs, which are 70 percent of the following month's sales, are shown on Row 26. July sales are forecasted at \$300 million, so June purchases are $0.7(\$300) = \210 million. The \$210 million must be paid in July, so that amount is shown on Row 27. Continuing, forecasted sales for August are \$400 million, so Allied must purchase $0.7(\$400) = \280 million of materials in July, and that amount must be paid in August. Other required payments are shown on Rows 28 through 32, and the total of all payments is shown on Row 33.

Next, on Row 35, we show the net cash flow (NCF) for each month, calculated as collections on Row 24 minus total payments on Row 33. The NCF for July is $-\$11$ million, and cash flows remain negative until October, when positive cash flows begin.

The monthly cash flows are then used to calculate the cumulative net cash flows as shown on Row 36. Here we add the NCF for each month to the cumulative NCF from the prior month. Since there was no prior cumulative NCF at the beginning of July, the cumulative NCF for July is simply the NCF for that month, $-\$11$ million. For August, we add the NCF for that month, $-\$37$ million, to the prior cumulative NCF, the $-\$11$ million at the end of July, to get the $-\$48$ million cumulative NCF at the end of August. There is another negative cash flow during September, so the cumulative NCF rises to $-\$105$ million. However, in October the NCF is positive, so the cumulative figure declines to $-\$61$ million, and it continues to decline in November and December.

Allied's target cash balance is \$10 million—it wants to maintain that balance at all times. We assume that it borrows the \$10 million at the start of the analysis, and we show that amount on Row 38. Because there is a projected cash loss of \$11 million during July, and because it borrowed \$10 million at the start of the month, at the end of July Allied's loan outstanding will total to \$21 million as shown on Row 39.⁸ It will incur additional cash shortfalls in August and September, and the required loan will continue to increase, peaking at \$115 million at the end of September. However, positive cash flows begin in October, and they will be used to reduce the loan, which will be completely paid off by the end of November, at which time the company will actually have funds to invest. Indeed, by the end of December Allied should have no loans outstanding and \$77 million available for investment.

Row 40 shows the maximum required loan, \$115 million, and Row 41 shows the maximum projected surplus, \$77 million. Allied's treasurer will need to arrange a line of credit so that the firm can borrow up to \$115 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 Allied expects to need, when the funds will be needed, and when the loan will be repaid. The

⁸ If Allied had begun with a positive cash balance, that amount would have been deducted from the initial loan needed. Note too that our cash budget is simplified because it does not show interest expense for the loan or interest income on investments. These items could be added quite easily.

lenders—and Allied’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 were projected, how changes when customers pay would affect the forecasts, and the like. The central issues of the questioning are these: *How accurate is the forecast likely to be, and what would be the effects of significant errors?*

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. For example, the data in Table 16-1 show the situation on the last day of each month, and we see that the maximum projected loan is \$115 million. However, if all payments had to be made on the 1st but most collections came on the 30th, Allied would have to make \$465 million of payments in September before it received the \$408 inflow from collections. In that case, the firm would need to borrow about \$500 million, not the \$115 million shown in Table 16-1. A daily cash budget would reveal that situation.

Table 16-1 was prepared using a spreadsheet, which makes it easy to change the assumptions. Therefore, we could examine the cash flow effects of changing sales, the target cash balance, when customers pay, and so forth. Also, the effects of changes in the 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?

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?

16.6 CASH AND MARKETABLE SECURITIES

When most of us use the term *cash*, we mean currency (paper money and coins) plus bank demand deposits. However, when corporate treasurers use the term, they often mean currency and demand deposits *plus very safe, highly liquid marketable securities that can be sold quickly at a predictable price and thus be converted to bank deposits.*⁹ Therefore, “cash” as reported on balance sheets generally includes short-term securities, which are also called “cash equivalents.”

Note, though, that a firm’s marketable security holdings can be divided into two categories: (1) *Operating short-term securities*, which are held primarily to provide liquidity and which are bought and sold as needed to provide funds for operations. These are a component of operating working capital. (2) *Other short-term securities*, which are holdings in excess of the amount needed to support normal operations. Highly profitable firms such as Microsoft often hold far more securities than are needed for liquidity purposes. Those securities will eventually be liquidated and the cash will be used for such things as paying a large one-time dividend, repurchasing stock, retiring debt, acquiring other firms, or

⁹ The reason corporate treasurers think of cash as they do is that, from their perspective, there is little difference between demand deposits and liquid marketable securities—they can call a dealer, sell securities, and have the proceeds deposited in the firm’s bank account in an hour or so. Also, note that many types of short-term securities are available. Treasury bills are an obvious example, but as we discussed in Chapter 5, there are many other safe, liquid, short-term, marketable securities.

financing major expansions. This breakdown is not reported on the balance sheet, but financial managers know how much of their securities will be needed for operating versus other purposes. In our discussion of working capital, the focus is on securities held to provide operating liquidity.

Currency

Retailers, casinos, hotels, movie theaters, and a few other businesses hold substantial amounts of currency, but the importance of currency has decreased over time due to the rise of credit cards, debit cards, and other payment mechanisms. Companies such as McDonald's need to hold enough currency to support operations, but more would raise capital costs and tempt robbers. Each firm decides its own optimal level, but even for retailers, currency generally represents a small part of total cash holdings.¹⁰

Demand Deposits

Demand (or checking) deposits are far more important than currency for most businesses. These deposits are used for *transactions*—paying for labor and raw materials, buying fixed assets, paying taxes, servicing debt, paying dividends, and so on. However, commercial demand deposits typically earn no interest, so firms try to minimize their holdings while still ensuring that they are able to pay suppliers promptly, take trade discounts, and take advantage of bargain purchases. The following techniques are used to optimize demand deposit holdings:

1. *Hold marketable securities rather than demand deposits to provide liquidity.* If the firm holds marketable securities, this reduces the need for demand deposits. For example, if a large bill requiring immediate payment comes in unexpectedly, the treasurer can simply call a securities dealer, sell some securities, and have funds deposited into the firm's checking account that same day. Securities pay interest whereas demand deposits do not, so holding securities in lieu of demand deposits increases profits.
2. *Borrow on short notice.* Firms can establish lines of credit under which they can borrow with just a telephone call if and when they need extra cash. Note, though, that they may have to pay fees for these commitments, and the cost of those fees must be considered when deciding to use borrowing capacity rather than securities to provide liquidity.
3. *Forecast payments and receipts better.* The better the firm can forecast its cash inflows and outflows, the smaller its needs for funds to meet unexpected requirements. Therefore, improving inflow/outflow forecasts lessens the need to hold liquid assets and thus reduces the required amount of working capital. The cash budget is the key tool used to improve cash forecasts.
4. *Speed up payments.* Firms can take actions to speed up their cash receipts. For example, they can use **lockboxes**, which are post office boxes operated by banks. Suppose a New York firm sells to customers all across the country. If it sends out bills and has customers make payments to its New York headquarters, time would be lost in the mail, in opening envelopes, in depositing checks in the bank, and in waiting for the bank to clear the checks to make sure they are good. To speed up this process, the firm can direct customers to send payments to a post office box in the customer's local area, then have a bank empty the box several times each day and get the collection process

Lockbox

A post office box operated by a bank to which payments are sent. Used to speed up effective receipt of cash.

¹⁰ In the "olden days," currency was held as a store of value, for use during emergencies, to make bargain purchases, and the like. That is true today only in undeveloped parts of the world.

started. If a firm's receipts average \$1 million per day, and if the use of lock-boxes can reduce the delay in getting usable cash from five days to one day, then the firm will receive an effective cash infusion of \$4 million. This will be a one-time benefit, but the firm will gain additional benefits as it grows.¹¹

5. *Use credit cards, debit cards, wire transfers, and direct deposits.* If a firm switches from selling on credit to accepting credit or debit cards, it will receive next-day cash and thus the same cash flow benefits as were described earlier. Similarly, if it requires customers to pay via wire deposits, this too will speed up collections, increase free cash flows, and reduce required cash holdings.
6. *Synchronize cash flows.* If a firm can synchronize its cash inflows and outflows, this can reduce its need for cash balances. For example, utilities, oil companies, department stores, and the like generally use "billing cycles" under which different customers are billed on different days, causing cash to flow in evenly during the month. These firms can then set up their own payment schedules to match their inflows. This reduces average cash balances, just as your personal average monthly balance could be reduced if your income came in at the same time as your required payments.

Banks have experts who can help firms optimize their cash management procedures. They charge a fee for this service, but the benefits of a good cash management system are well worth the cost.

Marketable Securities

Marketable securities held for operations are managed in conjunction with demand deposits—the management of one requires coordination with the other. Firms also purchase marketable securities as cash builds up from operations and then sell those securities when they need cash. Microsoft is a good example. It had accumulated more than \$60 billion of cash (mostly marketable securities) by the end of 2004. It needed to hold some of those securities for liquidity purposes, but mainly the funds just built up because Microsoft generated more cash from operations than it needed. Investors agitated for management to either use this "cash" in a more productive manner or else pay it out as dividends so stockholders could invest it themselves. Partly because of this pressure, in the fall of 2004 Microsoft announced a one-time dividend of \$30 billion, and it also stepped up its stock repurchase program. Microsoft's holdings of nonoperating marketable securities were the largest on record, but many other firms have large holdings and periodically go through similar self-evaluations.

Given the size and importance of marketable securities holdings, how they are managed can obviously have a significant effect on profits. A trade-off between risk and return is involved—the firm wants to earn high returns, but since marketable securities are held primarily to provide liquidity, treasurers want to hold securities that can be sold very quickly and at a known price. That means high-quality, short-term instruments. Long-term Treasury bonds are safe, but they are not well-suited for the marketable security portfolio because their prices will decline if interest rates rise. Similarly, short-term securities issued by

¹¹ We should mention the term *float*, as it often comes up in connection with cash management. If you write a check and it takes five days for the recipient to receive and deposit the check, and for it to be deducted from your account, then you have five days of float, or the use of the money for five days before you have to deposit funds in your account. That's "payment float." On the other hand, if someone sends you a check and it takes six days for you to receive and deposit it, and for the bank to clear the funds, then that's six days of "collection float." Your "net float" would be minus one day. Positive net float is good, negative net float is bad from the standpoint of minimizing required cash holdings.

Delta Airlines and other risky companies are not suitable because their prices will decline if the issuers' problems grow worse. Treasury bills, commercial paper (discussed in Section 16.11), bank certificates of deposit, and money market funds are suitable holdings.

A firm's relationship with its bank—especially its ability to borrow on short notice—has a significant effect on its need for demand deposits and marketable securities. If it has a firmly committed line of credit under which it can obtain funds with a simple telephone call, then it won't need much in the way of liquidity reserves.

Finally, note too that larger corporations shop for securities all around the world, buying wherever risk-adjusted rates are highest. This shopping tends to equalize worldwide rates—if interest rates in Europe are higher than rates in the United States for equally risky securities, then companies will buy European securities, driving their prices up and their yields down, until an equilibrium has been established. We truly live in a global economy.¹²



What two definitions of cash are commonly encountered?

Differentiate between marketable securities held for operating (transactions) purposes and securities held for other reasons.

How has the development of credit and debit cards affected firms' currency holdings?

How would the use of credit cards affect a firm's cash conversion cycle, assuming it previously allowed customers 30 days to pay for their purchases?

How does a firm's ability to borrow affect its optimal holdings of cash and securities?

Common stocks that are traded on the NYSE are liquid in the sense that they can be sold and converted to cash on short notice. Are stocks a good choice for a firm's marketable securities portfolio? Explain.

16.7 INVENTORIES

Inventories, which can include (1) *supplies*, (2) *raw materials*, (3) *work-in-process*, and (4) *finished goods*, are an essential part of virtually all business operations. Optimal inventory levels depend on sales, so sales must be forecasted before target inventories can be established. Moreover, because errors in setting inventory levels lead to lost sales or excessive carrying costs, inventory management is quite important. Therefore, firms use sophisticated computer systems to monitor their inventory holdings.

As we mentioned in the opening vignette to this chapter, retailers such as Best Buy, Wal-Mart, and Home Depot use computers to keep track of each inventory item by size, shape, and color, and the bar code information collected at checkout updates inventory records. When the inventory stock as indicated in

¹² Companies can also buy securities that are denominated in different currencies. Thus, if a firm's treasurer thinks that the euro is likely to appreciate against the dollar, then he or she might purchase securities denominated in euros, and if things work out as expected, the firm will earn interest and also enjoy an additional gain from the change in exchange rates. Again, these actions help to keep world financial markets in equilibrium.

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's required. The sales force generates the order, the purchasing department orders components from suppliers, and the suppliers must order materials from their own suppliers. Then, the suppliers ship the components to the appropriate Herman Miller plant, the plants build 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 company's reputation will be damaged, hurting future sales growth.

To prevent such consequences, Herman Miller turned to a process called supply chain management (SCM). The key element in SCM is sharing information

all the way from the point-of-sale at the retailer to suppliers, and even back to suppliers' suppliers. SCM requires special software, but even more important, it requires cooperation among the different companies and departments in the supply chain. A new culture of open communication is required, and this is often difficult for many companies because they are reluctant to divulge operating information. Many of Herman Miller's suppliers were initially wary of these new relationships. However, SCM has been a win-win situation, with increases in value for Herman Miller and its suppliers.

SCM enabled Herman Miller to sharply reduce its inventory and also to cut two weeks off delivery times to customers, in addition to operating its plants at a 20 percent higher volume without further capital expenditures. The bottom line result was higher earnings, cash flows, and 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.

the computer declines to a set level, the computer sends an order to the supplier's computer, specifying exactly what is needed. The computer also reports how fast items are moving, and if an item is moving too slowly it suggests a price cut to lower the inventory stock before the item becomes obsolete. Manufacturers like GE use similar systems to keep track of items and to place orders as they are needed.

Although inventory management is important, it is more of an issue for production managers and marketing people than financial managers. Still, financial managers are involved in several ways. First, it is expensive to install and maintain the computer systems used to track inventories, and a capital budgeting analysis as discussed in Part 4 of this text must be used to determine which system is best. Second, if the firm decides to increase its inventory holdings, then the financial manager must raise the capital needed to acquire the additional inventory. And third, the financial manager is responsible for identifying factors that affect the firm's overall profitability, using ratios and other procedures for comparing the firm with its benchmark companies. Therefore, the CFO will compare the firm's inventory-to-sales ratio with those of its benchmarks to see if things look "reasonable."

As inventory management is outside the mainstream of finance, we cover it in Web Appendix 16A rather than in the text chapter. We do, however, provide the box entitled "Supply Chain Management" to illustrate how inventories are managed by modern corporations.



What are the three primary tasks of the financial manager regarding inventory management?

16.8 ACCOUNTS RECEIVABLE

Although retail sales are often made for cash, sales of expensive items such as autos and appliances are generally on credit. Furthermore, most business-to-business sales are on credit. Thus, in the typical situation goods are shipped, inventories are reduced, and an **account receivable** is created.¹³ Eventually, the customer pays, the firm receives cash, and its receivables decline. Since the firm's credit policy is the primary determinant of accounts receivable, we begin by discussing credit policy.

Account Receivable

A balance due from a customer.

Credit Policy

A set of rules that include the firm's credit period, discounts, credit standards, and collection procedures offered.

Credit Period

The length of time customers have to pay for purchases.

Discounts

Price reductions given for early payment.

Credit Standards

The financial strength customers must exhibit to qualify for credit.

Collection Policy

Degree of toughness in enforcing the credit terms.

Credit Policy

Credit policy consists of these four variables:

1. **Credit period** is the length of time buyers are given to pay for their purchases. For example, the credit period might be 30 days. Customers prefer longer credit periods, so lengthening the period will stimulate sales. However, long credit periods lengthen the cash conversion cycle, hence ties up more capital in receivables, and that is costly. Also, the longer a receivable is outstanding, the higher the probability that the customer will default and the account will end up as a bad debt.
2. **Discounts** are price reductions given for early payment. The discount specifies the percentage reduction and how rapidly payment must be made to be eligible for the discount. For example, a 2 percent discount might be given if the customer pays within 10 days. Offering discounts has two benefits. First, the discount amounts to a price reduction, and lower prices stimulate sales. Second, discounts will cause some customers to pay earlier than they otherwise would, which will shorten the cash conversion cycle. However, discounts mean lower prices, hence lower revenues unless the quantity sold increases by enough to offset the price reduction. The benefits and costs of discounts must be balanced if a rational decision about them is to be made.
3. **Credit standards** refer to the required financial strength of acceptable credit customers. Factors considered here would be ratios like the customer's debt and interest coverage ratios, credit history (has the customer paid on time in the past, or tended to be delinquent), and the like. In essence, what is the likelihood that the customer will be willing and able to pay off the receivable on schedule? Note that if standards are set too low bad debt losses will be high, while if standards are set too high the firm will lose sales and thus profits. Thus, a balance must be struck between the costs and benefits of tighter credit standards.
4. **Collection policy** refers to the procedures used to collect past due accounts, including the toughness or laxity used in the process. At one extreme, the firm might write a series of polite letters after a fairly long delay, while at the other extreme delinquent accounts would be turned over to a collection agency relatively quickly. Some firmness should be used, but excessive pressure can lead basically good customers to take their business elsewhere. Again, a balance must be struck between the costs and benefits of different collection policies.

¹³ 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, in this case, the receivables. We will examine the transaction from the viewpoint of the purchaser in Section 16.9, when we discuss accounts payable as a source of funds and consider their cost relative to the cost of funds obtained from other sources.

Firms generally publish their **credit terms**, defined as a statement of their credit period and discounts policy. Thus, Allied Foods might have stated credit terms of 2/10, net 30, which means that a 2 percent discount is allowed if payment is received within 10 days of the purchase, and if the discount is not taken then the full amount is due in 30 days. Credit standards and collection policy are relatively subjective, so they are not generally discussed in the published credit terms.

Credit Terms

Statement of the credit period and any discount offered.

Setting and Implementing the Credit Policy

Credit policy is important for three main reasons: (1) It has a significant effect on sales, (2) it influences the amount of funds tied up in receivables, and (3) it affects the bad debt losses. Because of its importance, the firm's executive committee, which normally consists of the president plus the vice presidents of finance, marketing, and production, has the final say on setting the credit policy. Once the policy has been established, the credit manager, who typically works under the treasurer, must carry it out and monitor its effects. Managing a credit department requires fast, accurate, and up-to-date information. Several organizations, including Dun & Bradstreet, Equifax, and TransUnion, use computer-based networks to collect, store, and distribute credit information. A typical business credit report would include the following:

1. A summary balance sheet and income statement.
2. A number of key ratios, with trend information.
3. Information obtained from the firm's suppliers telling whether it pays promptly or slowly, and whether it has recently failed to make any payments.
4. A verbal description of the physical condition of the firm's operations.
5. A verbal description of the backgrounds of the firm's owners, including any previous bankruptcies, lawsuits, divorce settlement problems, and the like.
6. A summary rating, ranging from A for the best credit risks down to F for those that are deemed likely to default.

Credit scores, which are numerical scores from 0 to 10 that are based on a statistical analysis, provide a summary assessment of the likelihood that a potential customer will default on a required payment. 10 is very good, 1 is very bad. Computerized analytical systems assist in making better credit decisions, but in the final analysis, most credit decisions are really exercises in informed judgment.¹⁴

Credit Score

A numerical score from 1 to 10 that indicates the likelihood that a person or business will pay on time.

We have emphasized the costs of granting credit. *However, if it is possible to sell on credit and also to impose a carrying charge on the receivables that are outstanding, then credit sales can actually be more profitable than cash sales.* This is especially true for consumer durables (autos, appliances, and so on), but it is also true for certain types of industrial equipment. Thus, GM's General Motors Acceptance Corporation (GMAC) unit, which finances automobiles, is highly profitable, as

¹⁴ Credit analysts use procedures ranging from highly sophisticated, computerized "credit-scoring" systems, which actually calculate the statistical probability that a given customer will default, to informal procedures, which involve going through a checklist of factors that should be considered when processing a credit application. The credit-scoring systems use various financial ratios, such as the current ratio and the debt ratio (for businesses), and income, years with the same employer, and the like (for individuals), to determine the statistical probability of default. Credit is then granted to those with low default probabilities. The informal procedures often involve examining the "5 C's of Credit": character, capacity, capital, collateral, and conditions. Character is obvious; capacity is a subjective estimate of ability to repay; capital means how much net worth the borrower has; collateral means assets pledged to secure the loan; and conditions refers to business conditions, which affect ability to repay.

are other companies' credit subsidiaries.¹⁵ Some encyclopedia companies even lose money on cash sales but more than make up these losses from the carrying charges on their credit sales. Obviously, such companies would rather sell on credit than for cash!

The carrying charges on outstanding credit are generally about 18 percent on a nominal basis: 1.5 percent per month, so $1.5\% \times 12 = 18\%$. This is equivalent to an effective annual rate of $(1.015)^{12} - 1.0 = 19.6\%$. Having receivables outstanding that earn more than 18 percent is highly profitable unless there are too many bad debt losses.

Legal considerations must also be taken into account when setting credit policy. It is illegal, under the Robinson-Patman Act, for a firm to charge prices that discriminate between customers unless the different prices are cost-justified. The same holds true for credit—it is illegal to offer more favorable credit terms to one customer or class of customers than another unless the differences are cost-justified.

Monitoring Accounts Receivable

The total amount of accounts receivable outstanding at any given time is determined by the volume of credit sales and the average length of time between sales and collections. For example, suppose Boston Lumber Company (BLC), a wholesale distributor of lumber products, has credit sales of \$1,000 per day, requires payment after 10 days, and has no bad debts or slow-paying customers. Under these conditions, it must have the capital to carry \$10,000 of receivables:

$$\begin{aligned} \text{Accounts receivable} &= \text{Credit sales per day} \times \text{Length of collection period} && (16-5) \\ &= \$1,000 \times 10 \text{ days} = \$10,000 \end{aligned}$$

If either credit sales or the collection period changes, so will accounts receivable. For example, if sales doubled to \$2,000/day, then receivables would also double, and the firm would need an additional \$10,000 of capital to finance this increase. Similarly, if the collection period lengthened to 20 days, this too would double the receivables and require additional capital.

If management is not careful the collection period will creep up, as good customers take longer to pay and as sales are made to weaker customers, who tend to pay slowly or not at all, and thus accounts will become bad debts. So, it is important for the CFO to monitor receivables. Two monitoring techniques—days sales outstanding (DSO) and the aging schedule—are discussed next.

Days Sales Outstanding (DSO)

Suppose Super Sets Inc., a television manufacturer, sells 200,000 television sets a year at a price of \$198 each. All sales are on credit, with terms of 2/10, net 30, which means that if payment is made within 10 days, customers receive a 2 percent discount; otherwise the full amount is due within 30 days. Also, 70 percent of the customers take discounts and pay on Day 10, while the other 30 percent pay on Day 30.

Super Sets' *days sales outstanding (DSO)*, also known as the average collection period (ACP), is 16 days.

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

¹⁵ Companies that do a large volume of sales financing typically set up subsidiary companies called *captive finance companies* to do the actual financing. Thus, General Motors, DaimlerChrysler, and Ford all have captive finance companies, as do Sears, IBM, and General Electric.

Its average daily sales (ADS) is \$108,493.¹⁶

$$\begin{aligned} \text{ADS} &= \frac{(\text{Units sold})(\text{Sales price})}{365} = \frac{\text{Annual sales}}{365} && (16-6) \\ &= \frac{200,000(\$198)}{365} = \frac{\$39,600,000}{365} = \$108,493 \end{aligned}$$

Super Sets' accounts receivable, assuming a constant rate of sales throughout the year, will at all times be \$1,735,888:

$$\begin{aligned} \text{Receivables} &= (\text{ADS})(\text{DSO}) \\ &= (\$108,493)(16) = \$1,735,888 \end{aligned}$$

The DSO, or average collection period, is a measure of the average length of time it takes customers to pay for their credit purchases, and it can be compared with the industry average. For example, if all television manufacturers sell on the same credit terms, and if the industry average DSO is 25 days versus Super Sets' 16 days, then Super Sets either has a higher percentage of discount customers or a very good credit department. Finally, note that if you know the annual sales and the receivables balance, you can calculate DSO:

$$\text{DSO} = \frac{\text{Receivables}}{\text{Annual sales}/365} = \frac{\$1,735,888}{\$108,493} = 16 \text{ days}$$

The DSO can also be compared with the firm's own credit terms. For example, suppose Super Sets' DSO had been 35 days. In this case, some customers would obviously be taking more than 30 days to pay their bills. In fact, if many customers were paying within 10 days to take advantage of the discount, then others must, on average, be taking much longer than 35 days. One way to check this possibility is to use an aging schedule, which we describe next.

Aging Schedules

An **aging schedule** breaks down the receivables by age of account. Table 16-2 contains the December 31, 2005, aging schedules of Super Sets and another television manufacturer, Wonder Vision. Both firms offer the same credit terms, and both have the same total receivables. However, Super Sets' aging schedule indicates that all of its customers pay on time—70 percent pay on Day 10 while 30 percent pay on Day 30. Wonder Vision's schedule, which is more typical, shows that many of its customers are not abiding by its credit terms—some 27 percent of its receivables are more than 30 days past due, even though its credit terms call for full payment by Day 30.

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

Management should constantly monitor both the DSO and the aging schedule to detect developing trends and to see how actual collection experience compares with its credit terms and with those of other firms in the industry. If the DSO starts to lengthen, or if the aging schedule shows a high percentage of

Aging Schedule

A report showing how long accounts receivable have been outstanding.

¹⁶ Note that the full sales price, not the price less the discount, is used in the equation. Discounts are treated as a reduction from sales, but the full sales price is used to calculate the accounts receivable.

TABLE 16-2 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 (discount customers)	\$1,215,122	70%	\$ 815,867	47%
11–30 (pay on time)	520,766	30	451,331	26
31–45 (late)	0	0	260,383	15
46–60 (later)	0	0	173,589	10
60+ (very late or bad debts)	0	0	34,718	2
Total receivables	<u>\$1,735,888</u>	<u>100%</u>	<u>\$1,735,888</u>	<u>100%</u>

past-due accounts, as Wonder Vision's does, then the credit policy may need to be tightened.¹⁷



What are credit terms?

What are the four credit policy variables?

Define days sales outstanding (DSO). What can be learned from it, and how is it affected by seasonal sales fluctuations?

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

What is credit quality, and how is it assessed?

How does collection policy influence sales, the collection period, and the bad debt loss percentage?

How can cash discounts be used to influence sales volume and the DSO?

How do legal considerations affect a firm's credit policy?

16.9 ACCOUNTS PAYABLE (TRADE CREDIT)

Trade Credit

Debt arising from credit sales and recorded as an account receivable by the seller and as an account payable by the buyer.

Firms generally make purchases from other firms on credit and record the debt as an *account payable*. Accounts payable, or **trade credit**, is the largest single category of short-term debt, representing about 40 percent of the average corporation's current liabilities. This credit is a spontaneous source of financing in the sense that *it arises spontaneously from ordinary business transactions*. For example, suppose a firm makes a purchase of \$1,000 on terms of net 30, meaning that it must pay for goods 30 days after the invoice date. This instantly and spontaneously provides it with \$1,000 of credit for 30 days. If it purchases \$1,000 of goods each day,

¹⁷ Seasonal sales can make monitoring of receivables a bit more complicated. See Eugene F. Brigham and Phillip R. Daves, *Intermediate Financial Management*, 8th ed. (Mason, OH: Thomson/South-Western, 2004), Chapter 21, for a more complete discussion of the problems with the DSO and aging schedule and ways to correct for them.

then on average, it will be receiving 30 times \$1,000, or \$30,000, of credit from its suppliers. If sales, and consequently purchases, double, then its accounts payable would also double, to \$60,000. So, simply by growing, the firm spontaneously generates another \$30,000 of financing. Similarly, if the terms under which it bought were extended from 30 to 40 days, its accounts payable would expand from \$30,000 to \$40,000. Thus, both expanding sales and lengthening the credit period generate additional financing.

Trade credit can either be free or costly. If the seller does not offer discounts, then it is free in the sense that there is no cost for using this credit. However, if discounts are available, a complication arises. To illustrate, suppose PCC Inc. buys 20 microchips each day with a list price of \$100 per chip on terms of 2/10, net 30. Under these terms, the “true” price of the chips is $0.98(\$100) = \98 , because the chips can be purchased for only \$98 by paying within 10 days. Thus, the \$100 list price has two components:

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

If PCC decides to take the discount, it will pay at the end of Day 10 and show \$19,600 of accounts payables:¹⁸

$$\begin{aligned} \text{Accounts payable}_{(\text{Take discounts})} &= (10 \text{ days})(20 \text{ chips}) (\$98 \text{ per chip}) \\ &= \$19,600 \end{aligned}$$

If it decides to delay payment until the 30th day, then its trade credit will be \$58,800:

$$\begin{aligned} \text{Accounts payable}_{(\text{No discounts})} &= (30 \text{ days})(20 \text{ chips})(\$98 \text{ per chip}) \\ &= \$58,800 \end{aligned}$$

By not taking discounts, PCC can obtain an additional \$39,200 of trade credit, *but this \$39,200 is costly credit because the firm must give up the discounts to get it.* Therefore, PCC must answer this question: Could we obtain the additional \$39,200 at a lower cost from some other source, say, a bank?

To illustrate the situation, assume that PCC operates 365 days per year and buys 20 chips per day at a “true” price of \$98 per chip. Therefore, its total chip purchases are $20(\$98)(365) = \$715,400$ per year. If it does not take discounts, then its chips would cost $20(\$100)(365) = \$730,000$, or an additional \$14,600. *This \$14,600 is the annual cost of the \$39,200 of extra credit.* Dividing the \$14,600 cost by the \$39,200 additional credit yields the nominal annual cost rate of the additional trade credit, 37.2 percent:

$$\text{Nominal annual cost of trade credit} = \frac{\$14,600}{\$39,200} = 37.24\%$$

If PCC can borrow from its bank or some other source for less than 37.24 percent, it should take the discount and use only \$19,600 of trade credit.

¹⁸ 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 account payable must be recorded net of discounts, or at “true” prices. Then, the cost of not taking discounts is reported as an additional expense called “discounts lost.” This procedure highlights the often very high cost of not taking discounts. In PCC’s case, it would record payables of $20(\$98) = \$1,960$, not \$2,000, per day, and if it did not take the discount and had to pay the full \$2,000, then it would show the \$40 discount lost per day as an expense.

The same result can be obtained with the following equation:

$$\begin{aligned} \text{Nominal annual cost of trade credit} &= \frac{\text{Discount \%}}{100 - \text{Discount \%}} \times \frac{365}{\text{Days credit is outstanding} - \text{Discount period}} \quad (16-7) \\ &= \frac{2}{98} \times \frac{365}{20} = 2.04\% \times 18.25 = 37.24\% \end{aligned}$$

The numerator of the first term, Discount %, is the cost per dollar of credit, while the denominator, 100 – Discount %, represents the funds made available by not taking the discount. Thus, the first term, 2.04 percent, 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 per year the cost is incurred, 18.25 times in this example.¹⁹

With this background, we can define two types of trade credit, free and costly:

Free Trade Credit

Credit received during the discount period.

Costly Trade Credit

Credit taken in excess of free trade credit, whose cost is equal to the discount lost.

1. **Free trade credit** is the trade credit that is obtained without a cost, and it consists of all trade credit that is available without giving up discounts. In PCC's case, where it buys on terms of 2/10, net 30, the first 10 days of purchases, or \$19,600, are free.
2. **Costly trade credit** is any trade credit over and above the free trade credit. For PCC, the additional 20 days, or \$39,200, are not free because getting them means giving up the discount.

Firms should always use the free component, but they should use the costly component only if they cannot obtain funds at a lower cost from another source.

Note that the cost of trade credit can be reduced by paying late. 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 percent to 2.04% × 7.3 = 14.9%.

In periods of excess capacity, firms may be able to get away with deliberately paying late, or **stretching accounts payable**. However, this will subject them to a variety of problems associated with being a "slow payer."

The costs of the extra trade credit from not taking discounts under different credit terms, assuming payments are made on time, are shown here:

Credit Terms	COST OF ADDITIONAL CREDIT IF THE CASH DISCOUNT IS NOT TAKEN	
	Nominal Cost	Effective Cost
1/10, net 20	36.9%	44.3%
1/10, net 30	18.4	20.1
2/10, net 20	74.5	109.0
3/15, net 45	37.6	44.9

¹⁹ The nominal annual cost formula does not take account of compounding, and in effective annual interest terms, the cost of trade credit is even higher. The discount amounts to interest, and with terms of 2/10, net 30, the firm gains use of the funds for 30 – 10 = 20 days, so there are 365/20 = 18.25 "interest periods" per year. Remember that the first term in Equation 16-7, (Discount %)/(100 – Discount %) = 0.02/0.98 = 0.0204, is the periodic interest rate. That rate is paid 18.25 times each year, so the effective annual cost of trade credit is 44.6 percent, as shown:

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

Thus, the 37.2 percent nominal cost calculated with Equation 16-7 understates the true cost.

Stretching Accounts Payable

The practice of deliberately paying late.

As these data show, the cost of not taking discounts can be substantial. Incidentally, throughout the chapter, we assume that payments are made on either the *last day* for taking discounts or on the *last day* of the credit period unless otherwise noted. It would be foolish to pay on the 9th day or earlier, or on the 29th day or earlier, if the credit terms are 2/10, net 30.



What is trade credit?

What is the difference between free trade credit and costly trade credit?

What is the formula for finding the nominal annual cost of trade credit? What is the formula for the effective annual cost of trade credit?

How is the cost of trade credit affected by “stretching” accounts payable?

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

16.10 BANK LOANS

The key features of bank loans, another important source of short-term financing, are discussed in this section.

Promissory Note

The terms of a bank loan are spelled out in a **promissory note**. Here are some key features contained in most promissory notes:²⁰

1. *Amount*. The amount borrowed is indicated.
2. *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. Long-term loans always have a specific maturity date, while a short-term loan may or may not have a specified maturity. For example, a loan may mature in 30 days, 90 days, 6 months, or 1 year, or it may call for payment “on demand,” in which case the loan can remain outstanding as long as the borrower wants to continue using the funds and the bank agrees. 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. It is often expected that the loan will be renewed, but if the borrower’s financial position deteriorates, the bank can refuse to renew it. This can lead to bankruptcy. Because banks virtually never demand payment unless the borrower’s creditworthiness has deteriorated, some “short-term loans” remain outstanding for years, with the interest rate floating with rates in the economy.
3. *Interest rate*. The interest rate can be either *fixed* or *floating*. For larger loans it is typically indexed to the bank’s prime rate, to the T-bill rate, or to the London Inter-Bank Offer Rate (LIBOR). The note will also indicate whether the

Promissory Note

A document specifying the terms and conditions of a loan, including the amount, interest rate, and repayment schedule.

²⁰ Sometimes the note will also specify that the firm must maintain a “compensating balance” equal to from 10 to 20 percent of the face amount of the loan. This balance generally has the effect of increasing the true cost of the loan. Recent surveys indicate that compensating balances are much less common today than they were a few years ago.

bank uses a 360- or 365-day year for purposes of calculating interest. The indicated rate is a *nominal rate*, and the effective annual rate is generally higher.

4. *Interest only versus amortized.* Loans are either *interest only*, meaning that only interest is paid during the life of the loan, with the principal being repaid when the loan matures, or *amortized*, meaning that some of the principal is repaid on each payment date. Amortized loans are also called *installment loans*.
5. *Frequency of interest payments.* If the note is on an interest-only basis, it will indicate *how frequently interest must be paid*. Interest is typically calculated daily but paid monthly.
6. *Discount interest.* Most loans call for interest to be paid after it has been earned, but banks also lend on a *discount basis*, where interest is paid in advance. On a discount loan, the borrower actually receives less than the face amount of the loan, and this increases its effective cost. We discuss discount loans in Web Appendix 16B.
7. *Add-on loans.* Auto loans and other consumer installment loans are generally set up on an “add-on basis,” which means that interest charges over the life of the loan are calculated and then added to the face amount of the loan. Thus, the borrower signs a note calling for payment of the funds received plus all interest that must be paid over the life of the loan. The add-on feature raises the effective cost of a loan.
8. *Collateral.* If a loan is secured by equipment, buildings, accounts receivable, or inventories, this fact is indicated in the note. Security for loans is discussed in more detail in Section 16.13.
9. *Restrictive covenants.* The note may also specify that the borrower must maintain its current ratio, interest coverage ratio, and so on, at prescribed levels, and it spells out what happens if the borrower defaults on those covenants. Default provisions often allow the lender to demand immediate payment of the entire loan balance, or to increase the interest rate until the default is corrected.
10. *Loan guarantees.* If the borrower is a small corporation, the bank may insist that the larger stockholders *personally guarantee* the loan. Troubled companies’ owners have been known to divert assets from the company to relatives or other entities they own, so banks protect themselves by obtaining personal guarantees.

Line of Credit

Line of Credit

An arrangement in which a bank agrees to lend up to a specified maximum amount of funds during a designated period.

A **line of credit** is an agreement between a bank and a borrower indicating the maximum amount of credit the bank will extend to the borrower. For example, in December, 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 coming year, provided the borrower’s financial condition does not deteriorate. If on January 10 the financial manager signs a promissory note for \$15,000 for 90 days, this would be called “taking down” \$15,000 of the credit line. The \$15,000 would be credited to the firm’s checking account, and before it was repaid the firm could borrow an additional \$65,000 for a total of \$80,000. Such a line of credit would be informal and nonbinding, but formal and binding lines are available as discussed next.

Revolving Credit Agreement

A formal, committed line of credit extended by a bank or other lending institution.

Revolving Credit Agreement

A **revolving credit agreement** is a formal line of credit. To illustrate, in 2005 a Texas petroleum company negotiated a revolving credit agreement for \$100 million with a group of banks. The banks were formally committed for four years to lend the firm up to \$100 million if the funds were needed. The company, in turn,

paid an annual commitment fee of one-fourth of 1 percent on the unused balance of the commitment to compensate the banks for making the commitment. Thus, if the firm 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, 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 the firm actually borrowed. In this case, the interest rate on the “revolver” was pegged to the banks’ prime rate, being set at prime minus 0.5 percentage point, so the cost of the loan will vary over time as interest rates change.²¹

Note that a revolving credit agreement is similar to an informal line of credit, but with 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.

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, but loans to large, strong customers are made at rates below prime. Thus, loans to smaller, riskier borrowers are generally stated to carry an interest rate of “prime *plus* some number of percentage points,” but loans to larger borrowers like the Texas oil company may have a rate stated as “prime *minus* some percentage points.”

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 also 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, 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 percent in just four months, and it rose from 6 to 9 percent during 1994. The prime rate currently (August 2005) is 6.25 percent.

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. We discuss procedures used for consumer and small business loans in Web Appendix 16B. For illustrative purposes, we assume a loan of \$10,000 at the prime rate, currently 6.25 percent, with a 365-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**.

Prime Rate

A published interest rate charged by commercial banks to large, strong borrowers.

Regular, or Simple, Interest

The situation when interest only is paid monthly.

²¹ Each bank sets its own prime rate, but, because of competitive forces, most banks’ prime rates are identical. Further, most banks follow the rate set by the large New York City banks.

In recent years many banks have been lending to large, strong companies at rates below the prime rate. As we discuss in Section 16.11, larger firms have ready access to the commercial paper market, and if banks want to do business with these companies, they must match, or at least come close to, the commercial paper rate.

We begin by dividing the nominal interest rate, 6.25 percent in this case, by 365 to get the rate per day. The rate is expressed as a *decimal fraction*, not as a percentage:

$$\begin{aligned}\text{Simple interest rate per day} &= \frac{\text{Nominal rate}}{\text{Days in year}} \\ &= 0.0625/365 = 0.000171233\end{aligned}$$

To find the monthly interest payment, the daily rate is multiplied by the amount of the loan, and then by the number of days during the payment period. For our illustrative loan, the daily interest charge would be \$1.71233, and the total for January would be \$53.08:

$$\begin{aligned}\text{Interest charge for month} &= (\text{Rate per day})(\text{Amount of loan})(\text{Days in month}) \\ &= (0.000171233)(\$10,000)(31 \text{ days}) = \$53.08\end{aligned}$$

If interest were payable quarterly, and if there were 90 days in the particular quarter, then the interest payment would be \$154.11. The annual interest would be $0.000171233 \times \$10,000 \times 365 = \625.00 .

The *effective interest rate* on a loan depends on how frequently interest must be paid—the more frequently, 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 $(1 + 0.0625/12)^{12} - 1 = 6.4322\%$.

Calculating Banks' Interest Charges: Add-On Interest

Add-On Interest

Interest that is calculated and added to funds received to determine the face amount of an installment loan.

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 6.25 percent to buy a car, with the loan to be repaid in 12 monthly installments. At a 6.25 percent add-on rate, you would pay total interest charges of $\$10,000(0.0625) = \625 . 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, and 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 \$625 for the use of only about half the loan's face amount, as the average usable funds would be only about \$5,000. Therefore, we can calculate the approximate annual rate as 12.5 percent:

$$\begin{aligned}\text{Approximate annual rate}_{\text{Add-on}} &= \frac{\text{Interest paid}}{(\text{Amount received})/2} \quad (16-8) \\ &= \frac{\$625}{\$10,000/2} = 12.5\%\end{aligned}$$

To determine the effective rate of an add-on loan, we proceed as follows:

1. The total amount to be repaid is \$10,000 of principal plus \$625 of interest, or \$10,625.
2. The monthly payment is $\$10,625/12 = \885.42 .
3. You are thus paying off a 12-period annuity of \$885.42 to receive \$10,000 today. \$10,000 is the present value of the annuity, and here is the time line:



4. With a financial calculator, enter $N = 12$, $PV = 10000$, $PMT = -885.42$, $FV = 0$, and then press I/YR to obtain 0.945298 percent.
5. However, this is a *monthly* rate. The annual percentage rate (APR), which by law the bank is required to state in bold print on all “consumer loan” agreements, would be 11.34 percent:

$$\begin{aligned}\text{APR} &= (\text{Periods per year})(\text{Rate per period}) \\ &= 12(0.945298\%) = 11.343576\% \text{ rounded to } 11.34\%\end{aligned}$$

Prior to the passage of the truth in lending laws in the 1970s, most banks would have simply told borrowers that they were paying 6.25 percent. Now, though, they must highlight the 11.34 percent APR.

6. The effective annual rate is found as follows. Note that the monthly percentage rate, 0.945298 percent, must be divided by 100 to get a decimal fraction, $r_d = 0.00945298$, for use in this formula:²²

$$\begin{aligned}\text{Effective annual rate}_{\text{Add-on}} &= (1 + r_d)^N - 1.0 && (16-9) \\ &= (1 + 0.00945298)^{12} - 1.0 \\ &= 1.1195 - 1.0 = 11.95\%\end{aligned}$$

Other features of bank financing are discussed in Web Appendix 16B to this chapter.



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

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

What's the difference between simple interest and add-on interest as bankers use these terms?

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

If this loan had been on a 10 percent add-on basis, payable in 12 end-of-month installments, what would the monthly payments be, and the APR and effective rates? (\$45,833.33; 17.97% 19.52%)

16.11 COMMERCIAL PAPER

Commercial paper is a short-term promissory note issued by large, strong firms and sold primarily to other business firms, insurance companies, pension funds, money market mutual funds, and banks. Commercial paper is issued in denominations of at least \$100,000. It is generally unsecured, but “asset-backed paper” secured by credit card debt and other small, short-term loans, has also been issued. The amount of commercial paper outstanding is slightly larger than the amount of bank loans outstanding, so the paper market is huge and very important. A large majority of the commercial paper outstanding is issued by

Commercial Paper

Unsecured, short-term promissory notes of large firms, usually issued in denominations of \$100,000 or more and having an interest rate somewhat below the prime rate.

²² Note that if an installment loan is paid off ahead of schedule, additional complications arise. For the classic discussion of this point, see Dick Bonker, “The Rule of 78,” *Journal of Finance*, June 1976, pp. 877–888.

financial institutions. A likely reason for why this market is dominated by large financial institutions is that banks and other financial institutions are more likely to need large and varying amounts of short-term funds, and they tend to have among the highest credit ratings, which makes it easier for them to raise unsecured debt. Nonfinancial companies still tend to rely more heavily on bank loans for short-term funding. For example, in the first quarter of 2005, the Federal Reserve reported that commercial paper issued by nonfinancial firms totaled slightly more than \$115 billion—that same quarter nonfinancial firms had more than a trillion dollars of bank loans outstanding.



What is commercial paper?

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

16.12 ACCRUALS (ACCRUED LIABILITIES)

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, Social Security and income taxes withheld from employee payrolls, and sales taxes collected are generally paid on a weekly, monthly, or quarterly basis. Therefore, the balance sheet will typically show some accrued wages and taxes, which we refer to as **accruals**.

Accruals arise automatically, or spontaneously, from a firm's operations, hence they are **spontaneous funds**. For example, if sales grow by 50 percent, then accrued wages and taxes should also grow by about 50 percent. Accruals are "free" in the sense that no interest is paid on them. However, firms cannot generally control their amounts because the timing of wage payments is set by industry custom and tax payments are set by law. Thus, firms use all the accruals they can, but they have little control over their levels.

Note too that trade credit is also a spontaneous source of funds to support growth, because as the firm grows, so does its purchases and thus its accounts payable. However, the firm has more control over accounts payable because it can either take or not take discounts, and also delay payments to a certain extent. It does not have the same flexibility to delay payments for labor and taxes.

Accruals

Continually recurring short-term liabilities, especially accrued wages and accrued taxes.

Spontaneous Funds

Funds that are generated spontaneously as the firm expands.



What types of short-term credit are classified as accrued liabilities?

What is the cost of accrued liabilities?

If accruals have such a low cost, why don't firms use them even more?

16.13 USE OF SECURITY IN SHORT-TERM FINANCING

Loans can be secured by specific assets or they can be unsecured. Commercial paper is generally not secured, but other types of loans can be secured if this is deemed necessary or if it will result in a lower interest rate. Other things held constant, it is better to borrow on an unsecured basis because the bookkeeping costs associated with **secured loans** are often high. However, firms may find that they can borrow only if they put up collateral to protect the lender or that securing the loan enables them to borrow at a lower rate.

Secured Loan

A loan backed by collateral, often inventories or accounts receivable.

Stocks and bonds, land and buildings, equipment, inventory, and accounts receivable can all be used as collateral. However, few firms that need loans also hold portfolios of stocks and bonds. Similarly, land, buildings, and equipment are good forms of collateral, but they are generally used as security for long-term loans rather than short-term working capital loans. Therefore, most secured short-term business borrowing uses 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 loan. After examining the financial statements, the bank indicated that it would lend him a maximum of \$100,000 on an unsecured basis, and that the interest rate would be 10 percent. However, the company had about \$300,000 of accounts receivable that could be used as collateral, and with the receivables as security the bank agreed to lend the full \$200,000, and at the prime rate of 6.25 percent. Processing costs for administering the loan were fairly high, but even so the secured loan was less expensive than an unsecured loan would have been.²³

If the collateral securing a loan is to be kept on the borrower's premises, then a form called a *UCC-1* (Uniform Commercial Code-1) is filed with the secretary of the state in which the collateral is located, along with a *Security Agreement* (also part of the Uniform Commercial Code) that describes the nature of the agreement. The UCC-1 prevents the borrower from using the same collateral to secure loans from different lenders, and the security agreement spells out conditions under which the lender can seize the collateral.



What are the advantages and disadvantages of securing a loan from the borrower's standpoint?

What are two types of current assets that are frequently used as security for short-term loans?

How does the filed UCC-1 protect a secured lender?

Tying It All Together

This chapter discussed the management of current assets, including cash, marketable securities, inventory, and receivables. Current assets are essential, but there are costs associated with holding them, so if a company can reduce its current assets without hurting sales, this will increase its profitability. The investment in current assets must be financed, and this financing can be in the form of long-term debt, common equity, and/or short-term credit. Firms typically use trade credit and accruals, and they may also use bank debt or commercial paper.

Although current assets and procedures for financing them can be analyzed as we did in this chapter, decisions are normally made within the context of the firm's overall financial plan. We take up financial planning in the next chapter, hence we continue our discussion of working capital there.

²³ 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, and this has permitted corporations to borrow from lenders such as pension funds rather than being restricted to banks and other traditional short-term lenders.

SELF-TEST QUESTIONS AND PROBLEMS (Solutions Appear in Appendix A)

- ST-1 Key terms** Define each of the following terms:
- Working capital; net working capital; net operating working capital
 - Cash conversion cycle; inventory conversion period; average collection period; payables deferral period
 - Relaxed current asset policy; restricted current asset policy; moderate current asset policy
 - Permanent current assets; temporary current assets
 - Current asset financing policies; maturity matching (self-liquidating) approach to financing working capital
 - Cash budget; target cash balance; currency; demand deposits
 - Lockbox; synchronized cash flows
 - Marketable securities held to provide operating liquidity
 - Account receivable; days sales outstanding; aging schedule; credit score
 - Credit policy; credit period; discounts; credit standards; collection policy; credit terms
 - Trade credit; free versus costly trade credit
 - Promissory note; covenants
 - Line of credit; revolving credit agreement
 - Prime rate; "simple interest" versus add-on interest
 - Commercial paper
 - Accruals; spontaneous funds
 - Secured loan; UCC-1; security agreement
- ST-2 Working capital policy** The Calgary Company is thinking of modifying its working capital assets policy. Fixed assets are \$600,000, sales are projected at \$3 million, the EBIT/sales ratio is projected at 15 percent, the interest rate is 10 percent on all debt, the federal-plus-state tax rate is 40 percent, and Calgary plans to maintain a 50 percent debt-to-assets ratio. Three alternative current asset policies are under consideration: 40, 50, and 60 percent of projected sales. What is the expected return on equity under each alternative?
- ST-3 Current asset financing** Vanderheiden Press Inc. and the Herrenhouse Publishing Company had the following balance sheets as of December 31, 2005 (thousands of dollars):

	Vanderheiden Press	Herrenhouse Publishing
Current assets	\$100,000	\$ 80,000
Fixed assets (net)	100,000	120,000
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	50,000	50,000
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 percent.

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

QUESTIONS

- 16-1** Define cash conversion cycle (CCC), and explain why, holding other things constant, a firm's profitability would increase if it lowered its CCC.

- 16-2** What are some pros and cons of holding high levels of current assets in relation to sales? Use the Du Pont equation to help explain your answer.
- 16-3** What are the two definitions of cash, and why do corporate treasurers often use the second definition?
- 16-4** What is a cash budget and how can this statement be used to help reduce the amount of cash that a firm needs to carry? What are the advantages and disadvantages of daily over monthly cash budgets, and how might a cash budget be used when a firm is negotiating a loan from its bank?
- 16-5** What are the four key factors in a firm's credit policy? How would an easy policy differ from a tight policy? Give examples of how the four factors might differ between the two policies. How would the easy versus the tight policy affect sales? Profits?
- 16-6** What are two techniques that are used to help monitor accounts receivable? How would an easy versus a tight credit policy affect the results of these two monitoring techniques?
- 16-7** What does it mean to adopt a maturity matching approach to financing assets, including current assets? How would a more aggressive or a more conservative approach differ from the maturity matching approach, and how would each affect expected profits and risk? In general, is one approach better than the others?
- 16-8** Why is some trade credit called free while other credit is called costly? If a firm buys on terms of 2/10, net 30, pays at the end of the 30th day, and typically shows \$300,000 of accounts payable on its balance sheet, would the entire \$300,000 be free credit, would it be costly credit, or would some be free and some costly? Explain your answer. No calculations are necessary.
- 16-9** Define each of the following loan terms, and explain how they are related to one another: the prime rate, the rate on commercial paper, the simple interest rate on a bank loan calling for interest to be paid monthly, and the rate on an installment loan based on add-on interest. If the stated rate on each of these loans was 6 percent, would they all have equal effective annual rates? Explain.
- 16-10** Why are accruals called spontaneous sources of funds, what are their costs, and why don't firms use more of them?
- 16-11** Indicate by a (+), (-), or (0) whether each of the following events would probably cause accounts receivable (A/R), sales, and profits to increase, decrease, or be affected in an indeterminate manner:

	A/R	Sales	Profits
The firm tightens its credit standards.	_____	_____	_____
The terms of trade are changed from 2/10, net 30, to 3/10, net 30.	_____	_____	_____
The terms are changed from 2/10, net 30, to 3/10, net 40.	_____	_____	_____
The credit manager gets tough with past-due accounts.	_____	_____	_____

PROBLEMS

Easy
Problems 1–3

- 16-1** **Cash conversion cycle** Primrose Corp has \$15 million of sales, \$2 million of inventories, \$3 million of receivables, and \$1 million of payables. Its cost of goods sold is 80 percent of sales, and it finances working capital with bank loans at an 8 percent rate. What is Primrose's cash conversion cycle (CCC)? If Primrose could *lower* its inventories and receivables by 10 percent each and *increase* its payables by 10 percent, all without affecting either sales or cost of goods sold, what would the new CCC be, how much cash would be freed up, and how would that affect pre-tax profits?
- 16-2** **Receivables investment** Lamar Lumber Company has sales of \$10 million per year, all on credit terms calling for payment within 30 days, and its accounts receivable are \$2 million. What is Lamar's DSO, what would it be if all customers paid on time, and how much capital would be released if Lamar could take actions that led to on-time payments?
- 16-3** **Cost of trade credit and bank loan** Lamar Lumber buys \$8 million of materials (net of discounts) on terms of 3/5, net 60, and it currently pays after 5 days and takes discounts.

Lamar plans to expand, and this will require additional financing. If Lamar decides to forego discounts, how much additional credit could it get, and what would the nominal and effective cost of that credit be? If it could get the funds from a bank at a rate of 10 percent, interest paid monthly, based on a 365-day year, what would be the effective cost of the bank loan, and should Lamar use bank debt or additional trade credit? Explain.

Intermediate
Problems 4–6

16-4 Cash conversion cycle The Zocco Corporation has an inventory conversion period of 75 days, an average collection period of 38 days, and a payables deferral period of 30 days.

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

16-5 Receivables investment McDowell Industries sells on terms of 3/10, net 30. Total sales for the year are \$912,500; 40 percent of the customers pay on the 10th day and take discounts, while the other 60 percent pay, on average, 40 days after their purchases.

- What is the days' sales outstanding?
- What is the average amount of receivables?
- What is the percentage cost of trade credit to customers who take the discount and to those who do not take it?
- What would happen to its accounts receivable if McDowell toughened up on its collection policy with the result that all nondiscount customers paid on the 30th day?

16-6 Working capital investment The Prestopino Corporation produces motorcycle batteries. Prestopino turns out 1,500 batteries a day at a cost of \$6 per battery for materials and labor. It takes the firm 22 days to convert raw materials into a battery. Prestopino allows its customers 40 days in which to pay for the batteries, and the firm generally pays its suppliers in 30 days.

- What is the length of Prestopino's cash conversion cycle?
- At a steady state in which Prestopino produces 1,500 batteries a day, what amount of working capital must it finance?
- By what amount could Prestopino reduce its working capital financing needs if it was able to stretch its payables deferral period to 35 days?
- Prestopino's management is trying to analyze the effect of a proposed new production process on its working capital investment. The new production process would allow Prestopino to decrease its inventory conversion period to 20 days and to increase its daily production to 1,800 batteries. However, the new process would cause the cost of materials and labor to increase to \$7. Assuming the change does not affect the average collection period (40 days) or the payables deferral period (30 days), what will be the length of its cash conversion cycle and its working capital financing requirement if the new production process is implemented?

Challenging
Problems 7–10

16-7 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 2005 sales (all on credit) were \$150,000, and it earned a net profit of 6 percent, or \$9,000. It turned over its inventory 6 times during the year, and its DSO was 36.5 days. The firm had fixed assets totaling \$35,000. Christie's payables deferral period is 40 days.

- Calculate Christie's cash conversion cycle.
- Assuming Christie holds negligible amounts of cash and marketable securities, calculate its total assets turnover and ROA.
- Suppose Christie's managers believe that the inventory turnover can be raised to 7.3 times. What would Christie's cash conversion cycle, total assets turnover, and ROA have been if the inventory turnover had been 7.3 for 2005?

16-8 Working capital policy The Rentz Corporation is investigating 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 plans to maintain a 60 percent debt ratio. Rentz's interest rate is currently 8 percent on both short-term and longer-term debt (which the firm uses in its permanent structure). Three alternatives regarding the projected current asset level are under consideration: (1) a tight policy where current assets would be only 45 percent of projected sales, (2) a moderate policy where current assets would be 50 percent of sales, and (3) a relaxed policy where current assets would be 60 percent of sales. Earnings before interest and taxes should be 12 percent of total sales, and the federal-plus-state tax rate is 40 percent.

- What is the expected return on equity under each current asset level?
- In this problem, we assume that expected sales are independent of the current asset policy. Is this a valid assumption?
- How would the firm's risk be affected by the different policies?

16-9 Lockbox system The Hardin-Gehr Corporation (HGC) began operations 5 years ago as a small firm serving customers in the Detroit area. However, its reputation and market area grew quickly, and today HGC has customers all over the United States. Despite its broad customer base, HGC has maintained its headquarters in Detroit, and it keeps its central billing system there. On average, it takes 5 days from the time customers mail in payments until HGC can receive, process, and deposit them. HGC would like to set up a lockbox collection system, which it estimates would reduce the time lag from customer mailing to deposit by 3 days—bringing it down to 2 days. HGC receives an average of \$1,400,000 in payments per day.

- How much free cash would HGC generate if it implemented the lockbox system? Would this be a one-time cash flow or a recurring one, assuming the company ceases to grow? How would growth affect your answer?
- If HGC has an opportunity cost of 10 percent, how much is the lockbox system worth on an annual basis?
- What is the maximum monthly charge HGC should pay for the lockbox system?

16-10 Cash budgeting Helen Bowers, owner of Helen's Fashion Designs, is planning to request a line of credit from her bank. She has estimated the following sales forecasts for the firm for parts of 2006 and 2007:

May 2006	\$180,000
June	180,000
July	360,000
August	540,000
September	720,000
October	360,000
November	360,000
December	90,000
January 2007	180,000

Estimates regarding payments obtained from the credit department are as follows: collected within the month of sale, 10 percent; collected the month following the sale, 75 percent; collected the second month following the sale, 15 percent. Payments for labor and raw materials are made the month after these services were provided. Here are the estimated costs of labor plus raw materials:

May 2006	\$ 90,000
June	90,000
July	126,000
August	882,000
September	306,000
October	234,000
November	162,000
December	90,000

General and administrative salaries are approximately \$27,000 a month; lease payments under long-term leases are \$9,000 a month; depreciation charges are \$36,000 a month; miscellaneous expenses are \$2,700 a month; income tax payments of \$63,000 are 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 be \$132,000, and a minimum cash balance of \$90,000 should be maintained throughout the cash budget period.

- Prepare a monthly cash budget for the last 6 months of 2006.
- Prepare monthly estimates of the required financing or excess funds—that is, the amount of money Bowers will need to borrow or will have available to invest.
- Now suppose receipts from sales come in uniformly during the month (that is, cash receipts come in at the rate of $\frac{1}{30}$ each day), but all outflows must be paid on the 5th. Will this affect the cash budget; that is, will the cash budget you prepared be

valid under these assumptions? If not, what could be done to make a valid estimate of the peak financing requirements? No calculations are required, although if you want to, you can use calculations to illustrate the effects.

- d. Bowers sales are seasonal, and it produces on a seasonal basis, just ahead of sales. Without making any calculations, discuss how the company's current and debt ratios would vary during the year if all financial requirements are met with short-term bank loans. Could changes in these ratios affect the firm's ability to obtain bank credit?

COMPREHENSIVE/SPREADSHEET PROBLEM

16-11 **Cash budgeting** Rework Problem 16-10 using a spreadsheet model. After completing parts a through d, answer the following related question.

- e. If its customers began to pay late, this would slow down collections and thus increase the required loan amount. If sales declined this would also have an effect on the required loan. Do a sensitivity analysis that shows the effects of these two factors on the maximum loan requirement.

Integrated Case

Ski Equipment Inc.

16-12 **Managing current assets** Dan Barnes, financial manager of Ski Equipment Inc. (SKI), is excited, but apprehensive. The company's founder recently sold his 51 percent controlling block of stock to Kent Koren, who is a big fan of EVA (Economic Value Added). EVA is found by taking the after-tax operating profit and then subtracting the dollar cost of all the capital the firm uses:

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

If EVA is positive, then the firm is creating value. On the other hand, if EVA is negative, 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 can generate its current level of sales with less assets, it would need less capital. That would, other things held constant, lower capital costs and increase its EVA.

Shortly after he took control of SKI, 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 something is seriously amiss elsewhere in the company. Costs are too high, prices are too low, or the company employs too much capital, and he 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 inventories, 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, while 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.

- a. Barnes plans to use the ratios in Table IC16-1 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 Table IC16-1 data, does SKI seem to be following a relaxed, moderate, or restricted working capital policy?
- b. How can we distinguish between a relaxed but rational working capital policy and a situation where a firm simply has a lot of current assets because it is inefficient? Does SKI's working capital policy seem appropriate?
- c. SKI tries to match the maturity of its assets and liabilities. Describe how SKI could adopt either a more aggressive or more conservative financing policy.
- d. Assume that SKI's payables deferral period is 30 days. Now, calculate the firm's cash conversion cycle.
- e. What might SKI do to reduce its cash and securities 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 in Table IC16-2. (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 in Table IC16-2.

- 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 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. Interestingly, 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 in Table IC16-1, 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. Is there any reason to think that SKI may be holding too much inventory? If so, how would that affect EVA and ROE?
- i. 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.
- j. Barnes knows that SKI sells on the same credit terms as other firms in its industry. Use the ratios presented in Table IC16-1 to explain whether SKI's customers pay more or less promptly than those of its competitors. If there are differences, does that suggest that 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?
- k. Does SKI face any risks if it tightens its credit policy?
- l. 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?
- m. Assume that SKI buys 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. Also, assume that it purchases \$3 million of components per year, net of discounts. How much free trade credit can the company get, how much costly trade credit can it get, and what is the percentage cost of the costly credit? Should SKI take discounts?
- n. Suppose SKI decided to raise an additional \$100,000 as a 1-year loan from its bank, for which it was quoted a rate of 8 percent. What is the effective annual cost rate assuming simple interest and add-on interest on a 12-month installment loan?

TABLE IC16-1 *Selected Ratios: SKI and Industry Average*

	SKI	Industry
Current	1.75	2.25
Debt/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	4.82	7.00
Fixed assets turnover	11.35	12.00
Total assets turnover	2.08	3.00
Profit margin on sales	2.07%	3.50%
Return on equity (ROE)	10.45%	21.00%

TABLE IC16-2 *SKI's Cash Budget for January and February*

	Nov	Dec	Jan	Feb	Mar	Apr
I. COLLECTIONS AND PURCHASES WORKSHEET						
(1) Sales (gross)	\$71,218	\$68,212	\$65,213	\$52,475	\$42,909	\$30,524
<i>Collections</i>						
(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)			7,121.80	6,821.20		
(5) Total collections (Lines 2+3+4)			<u>\$67,651.95</u>	<u>\$62,755.40</u>		
<i>Purchases</i>						
(6) (0.85) (forecasted sales 2 months from now)		\$44,603.75	\$36,472.65	\$25,945.40		
(7) Payments (1-month lag)			44,603.75	36,472.65		
II. CASH GAIN OR LOSS FOR MONTH						
(8) Collections (from Section I)			\$67,651.95	\$62,755.40		
(9) Payments for purchases (from Section I)			44,603.75	36,472.65		
(10) Wages and Salaries			6,690.56	5,470.90		
(11) Rent			2,500.00	2,500.00		
(12) Taxes						
(13) Total payments			<u>\$53,794.31</u>	<u>\$44,443.55</u>		
(14) Net cash gain (loss) during month (Line 8–Line 13)			<u>\$13,857.64</u>	<u>\$18,311.85</u>		

TABLE IC16-2 *continued*

	Nov	Dec	Jan	Feb	Mar	Apr
III. CASH SURPLUS OR LOAN REQUIREMENT						
(15) Cash at beginning of month if no borrowing is done			\$ 3,000.00	\$16,857.64		
(16) Cumulative cash [cash at start + gain or – loss = (Line 14 + Line 15)]			\$16,857.64	\$35,169.49		
(17) Target cash balance			1,500.00	1,500.00		
(18) Cumulative surplus cash or loans outstanding to maintain \$1,500 target cash balance (Line 16 – Line 17)			\$15,357.64	\$33,669.49		



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