## Chapter Review and Self-Test Problems

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

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

Calculate the operating and cash cycles.

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

**GREENWELL CORPORATION**
**Cash Budget (in millions)**

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

## Answers to Chapter Review and Self-Test Problems

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

$$\text{Inventory turnover} = \$11{,}375/[(1{,}273 + 1{,}401)/2] = 8.51 \text{ times}$$
$$\text{Receivables turnover} = \$14{,}750/[(3{,}782 + 3{,}368)/2] = 4.13 \text{ times}$$
$$\text{Payables turnover} = \$11{,}375/[(1{,}795 + 2{,}025)/2] = 5.96 \text{ times}$$

We can now calculate the various periods:

$$\text{Inventory period} = 365 \text{ days}/8.51 \text{ times} = 42.89 \text{ days}$$
$$\text{Receivables period} = 365 \text{ days}/4.13 \text{ times} = 88.38 \text{ days}$$
$$\text{Payables period} = 365 \text{ days}/5.96 \text{ times} = 61.24 \text{ days}$$

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

**19.2** Because Greenwell has a 60-day collection period, only those sales made in the first 30 days of the quarter will be collected in the same quarter. Total cash collections in the first quarter will thus equal 30/90 = ⅓ of sales plus beginning receivables, or ⅓ × \$150 + 240 = \$290. Ending receivables for the first quarter (and the second-quarter beginning receivables) are the other ⅔ of sales, or ⅔ × \$150 = \$100. The remaining calculations are straightforward, and the completed budget follows.

**GREENWELL CORPORATION**
**Cash Budget**
**(in millions)**

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

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

## Concepts Review and Critical Thinking Questions

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

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

4. **Cost of Current Assets** Loftis Manufacturing, Inc., has recently installed a just-in-time (JIT) inventory system. Describe the effect this is likely to have on the company's carrying costs, shortage costs, and operating cycle.
5. **Operating and Cash Cycles** Is it possible for a firm's cash cycle to be longer than its operating cycle? Explain why or why not.

Use the following information to answer Questions 6–10: In April 1994, Ameritech Corporation, one of the "Baby Bell" phone companies, told its 70,000 suppliers that it would stretch out its bill payments to 45 days from 30 days beginning on May 1. The reason given was "to control costs and optimize cash flow."

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

## Questions and Problems

**Basic**
(Questions 1–11)

1. **Changes in the Cash Account** Indicate the impact of the following corporate actions on cash, using the letter *I* for an increase, *D* for a decrease, or *N* when no change occurs.
   **a.** A dividend is paid with funds received from a sale of debt.
   **b.** Real estate is purchased and paid for with short-term debt.
   **c.** Inventory is bought on credit.
   **d.** A short-term bank loan is repaid.
   **e.** Next year's taxes are prepaid.
   **f.** Preferred stock is redeemed.
   **g.** Sales are made on credit.
   **h.** Interest on long-term debt is paid.
   **i.** Payments for previous sales are collected.
   **j.** The accounts payable balance is reduced.
   **k.** A dividend is paid.
   **l.** Production supplies are purchased and paid for with a short-term note.
   **m.** Utility bills are paid.
   **n.** Cash is paid for raw materials purchased for inventory.
   **o.** Marketable securities are sold.
2. **Cash Equation** Kaleb's Korndog Corp. has a book net worth of $8,500. Long-term debt is $1,800. Net working capital, other than cash, is $2,250. Fixed assets are $2,200. How much cash does the company have? If current liabilities are $1,000, what are current assets?
3. **Changes in the Operating Cycle** Indicate the effect that the following will have on the operating cycle. Use the letter *I* to indicate an increase, the letter *D* for a decrease, and the letter *N* for no change.

**Basic** (*continued*)

**a.** Average receivables goes up.
**b.** Credit repayment times for customers are increased.
**c.** Inventory turnover goes from 3 times to 6 times.
**d.** Payables turnover goes from 6 times to 11 times.
**e.** Receivables turnover goes from 7 times to 9 times.
**f.** Payments to suppliers are accelerated.

**4.** **Changes in Cycles** Indicate the impact of the following on the cash and operating cycles, respectively. Use the letter *I* to indicate an increase, the letter *D* for a decrease, and the letter *N* for no change.
**a.** The terms of cash discounts offered to customers are made less favorable.
**b.** The cash discounts offered by suppliers are decreased; thus, payments are made earlier.
**c.** An increased number of customers begin to pay in cash instead of with credit.
**d.** Fewer raw materials than usual are purchased.
**e.** A greater percentage of raw material purchases are paid for with credit.
**f.** More finished goods are produced for inventory instead of for order.

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

| | Q1 | Q2 | Q3 | Q4 |
|---|---|---|---|---|
| Sales | $600 | $720 | $800 | $640 |

**a.** Accounts receivable at the beginning of the year are $200. Kahauloa has a 45-day collection period. Calculate cash collections in each of the four quarters by completing the following:

| | Q1 | Q2 | Q3 | Q4 |
|---|---|---|---|---|
| Beginning receivables | | | | |
| Sales | | | | |
| Cash collections | | | | |
| Ending receivables | | | | |

**b.** Rework (*a*) assuming a collection period of 60 days.
**c.** Rework (*a*) assuming a collection period of 30 days.

**6.** **Calculating Cycles** Consider the following financial statement information for the Bulldog Icers Corporation:

| Item | Beginning | | Ending |
|---|---|---|---|
| Inventory | $7,281 | | $9,318 |
| Accounts receivable | 4,814 | | 5,108 |
| Accounts payable | 6,623 | | 7,415 |
| Net sales | | $65,180 | |
| Cost of goods sold | | 51,912 | |

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

**7.** **Factoring Receivables** Your firm has an average collection period of 42 days. Current practice is to factor all receivables immediately at a 2 percent discount.

**Basic** (*continued*)

What is the effective cost of borrowing in this case? Assume that default is extremely unlikely.

8. **Calculating Payments** Iron Man Products has projected the following sales for the coming year:

| | Q1 | Q2 | Q3 | Q4 |
|---|---|---|---|---|
| Sales | $450 | $525 | $650 | $500 |

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

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

| | Q1 | Q2 | Q3 | Q4 |
|---|---|---|---|---|
| Payment of accounts | $ | $ | $ | $ |

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

| | Q1 | Q2 | Q3 | Q4 |
|---|---|---|---|---|
| Payment of accounts | $ | $ | $ | $ |

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

| | Q1 | Q2 | Q3 | Q4 |
|---|---|---|---|---|
| Payment of accounts | $ | $ | $ | $ |

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

Projected quarterly sales are:

| | Q1 | Q2 | Q3 | Q4 |
|---|---|---|---|---|
| Sales | $700 | $900 | $850 | $600 |

Sales for the first quarter of the following year are projected at $820. Calculate Thunder's cash outlays by completing the following:

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

**Basic** (*continued*)

**10. Calculating Cash Collections** The following is the sales budget for Duck-n-Run, Inc., for the first quarter of 2002:

| | January | February | March |
|---|---|---|---|
| Sales budget | $140,000 | $162,000 | $180,000 |

Credit sales are collected as follows:

65 percent in the month of the sale
20 percent in the month after the sale
15 percent in the second month after the sale

The accounts receivable balance at the end of the previous quarter was $60,000 ($26,000 of which was uncollected December sales).

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

**11. Calculating the Cash Budget** Here are some important figures from the budget of Nashville Nougats, Inc., for the second quarter of 2002:

| | April | May | June |
|---|---|---|---|
| Credit sales | $330,000 | $372,000 | $432,000 |
| Credit purchases | 132,000 | 150,000 | 185,000 |
| Cash disbursements | | | |
| Wages, taxes, and expenses | 20,400 | 22,200 | 25,200 |
| Interest | 9,600 | 9,600 | 9,600 |
| Equipment purchases | 70,000 | 84,000 | 0 |

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

In March 2002, credit sales were $210,000, and credit purchases were $156,000. Using this information, complete the following cash budget:

| | April | May | June |
|---|---|---|---|
| Beginning cash balance | $300,000 | | |
| Cash receipts | | | |
| Cash collections from credit sales | | | |
| Total cash available | | | |
| Cash disbursements | | | |
| Purchases | | | |
| Wages, taxes, and expenses | | | |
| Interest | | | |
| Equipment purchases | | | |
| Total cash disbursements | | | |
| Ending cash balance | | | |

**Intermediate**
(Questions 12–15)

12. **Costs of Borrowing** You've worked out a line of credit arrangement that allows you to borrow up to $50 million at any time. The interest rate is 0.52 percent per month. In addition, 4 percent of the amount that you borrow must be deposited in a non-interest-bearing account. Assume that your bank uses compound interest on its line of credit loans.
    **a.** What is the effective annual interest rate on this lending arrangement?
    **b.** Suppose you need $10 million today and you repay it in six months. How much interest will you pay?

13. **Costs of Borrowing** A bank offers your firm a revolving credit arrangement for up to $60 million at an interest rate of 1.90 percent per quarter. The bank also requires you to maintain a compensating balance of 6 percent against the *unused* portion of the credit line, to be deposited in a non-interest-bearing account. Assume you have a short-term investment account at the bank that pays 1.50 percent per quarter, and assume that the bank uses compound interest on its revolving credit loans.
    **a.** What is your effective annual interest rate (an opportunity cost) on the revolving credit arrangement if your firm does not use it during the year?
    **b.** What is your effective annual interest rate on the lending arrangement if you borrow $40 million immediately and repay it in one year?
    **c.** What is your effective annual interest rate if you borrow $60 million immediately and repay it in one year?

14. **Calculating the Cash Budget** Wildcat, Inc., has estimated sales (in millions) for the next four quarters as:

| | Q1 | Q2 | Q3 | Q4 |
|---|---|---|---|---|
| Sales | $210 | $180 | $240 | $270 |

Sales for the first quarter of the year after this one are projected at $225 million. Accounts receivable at the beginning of the year were $76 million. Wildcat has a 45-day collection period.

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

Wildcat plans a major capital outlay in the second quarter of $90 million. Finally, the company started the year with a $68 million cash balance and wishes to maintain a $30 million minimum balance.

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

**WILDCAT, INC.**
**Cash Budget**
**(in millions)**

| | Q1 | Q2 | Q3 | Q4 |
|---|---|---|---|---|
| Beginning cash balance | $68 | | | |
| Net cash inflow | | | | |
| Ending cash balance | | | | |
| Minimum cash balance | 30 | | | |
| Cumulative surplus (deficit) | | | | |

**Intermediate** (*continued*)

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

**WILDCAT, INC.**
**Short-Term Financial Plan**
**(in millions)**

| | Q1 | Q2 | Q3 | Q4 |
|---|---|---|---|---|
| Beginning cash balance | $68 | | | |
| Net cash inflow | | | | |
| New short-term investments | | | | |
| Income from short-term investments | | | | |
| Short-term investments sold | | | | |
| New short-term borrowing | | | | |
| Interest on short-term borrowing | | | | |
| Short-term borrowing repaid | | | | |
| Ending cash balance | | | | |
| Minimum cash balance | 30 | | | |
| Cumulative surplus (deficit) | | | | |
| Beginning short-term investments | | | | |
| Ending short-term investments | | | | |
| Beginning short-term debt | | | | |
| Ending short-term debt | | | | |

15. **Cash Management Policy** Rework Problem 14 assuming:

**a.** Wildcat maintains a minimum cash balance of $45 million.

**b.** Wildcat maintains a minimum cash balance of $15 million.

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

**Challenge** (Questions 16–17)

16. **Costs of Borrowing** In exchange for a $750 million fixed commitment line of credit, your firm has agreed to do the following:

1. Pay 1.8 percent per quarter on any funds actually borrowed
2. Maintain a 5 percent compensating balance on any funds actually borrowed
3. Pay an up-front commitment fee of .105 percent of the amount of the line

Based on this information, answer the following:

**a.** Ignoring the commitment fee, what is the effective annual interest rate on this line of credit?

**b.** Suppose your firm immediately uses $550 million of the line and pays it off in one year. What is the effective annual interest rate on this $550 million loan?

17. **Costs of Borrowing** Stream Bank offers your firm a 7 percent *discount* interest loan for up to $3 million, and in addition requires you to maintain an 8 percent compensating balance against the amount borrowed. What is the effective annual interest rate on this lending arrangement?

## S&P Problems

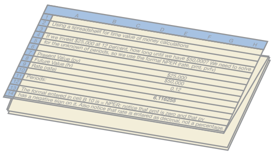
STANDARD & POOR'S

1. **Cash and Operating Cycles** Find the most recent financial statements for Dell Computer (DELL) and Boeing (BA). Calculate the cash and operating cycle for each company for the most recent year. Are the numbers similar for these companies? Why or why not?
2. **Cash and Operating Cycles** Download the most recent quarterly financial statements for Kmart (KM). Calculate the operating and cash cycle for Kmart over each of the last four quarters. Comment on any changes in the operating or cash cycle over this period.

## What's On the Web?

**19.1** **Cash Cycle** Go to www.marketguide.com. You will need to find the most recent annual income statement and two most recent balance sheets for American Home Products (AHP) and Homestake Mining (HM). Both companies are in the S&P 500 Index. AHP is involved in pharmaceuticals and consumer health care, while Homestake Mining is a leading gold mining company. Calculate the cash cycle for each company and comment on any similarities or differences.

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



**Spreadsheet Templates** 19–5, 19–6, 19–14