a. Permanent current assets are those current assets required when the economy is weak and seasonal sales are at their low point. Thus, this level of current assets always requires financing and can be regarded as permanent. Temporary current assets are those current assets required above the permanent level when the economy is strong and/or seasonal sales are high.

b. A moderate current asset financing policy matches asset and liability maturities. It is also referred to as the maturity matching, or "self-liquidating" approach. When a firm finances all of its fixed assets with long-term capital but part of its permanent current assets with short-term, nonspontaneous credit this is referred to as an aggressive current asset financing policy. With a conservative current asset financing policy permanent capital is used to finance all permanent asset requirements, as well as to meet some or all of the seasonal demands.

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

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

e. Trade credit is debt arising from credit sales and recorded as an account receivable by the seller and as an account payable by the buyer. Stretching accounts payable is the practice of deliberately paying accounts payable late. Free trade credit is credit received during the discount period. Credit taken in excess of free trade credit, whose cost is equal to the discount lost is termed costly trade credit.

f. A promissory note is a document specifying the terms and conditions of a loan, including the amount, interest rate, and repayment schedule. A line of credit is an arrangement in which a bank agrees to lend up to a specified maximum amount of funds during a designated period. A revolving credit agreement is a formal, committed line of credit extended by a bank or other lending institution.

g. Prime rate is a published interest rate charged by commercial banks to large, strong borrowers.
h. The situation when interest is not compounded, that is, interest is not earned on interest, is simple interest. Discount interest is interest that is calculated on the face amount of a loan but is paid in advance. Add-on interest is interest that is calculated and added to funds received to determine the face amount of an installment loan.

i. A compensating balance (CB) is a minimum checking account balance that a firm must maintain with a commercial bank, generally equal to 10 to 20 percent of the amount of loans outstanding.

j. Commercial paper is 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.

k. A secured loan is backed by collateral, often inventories or receivables.

21-2 The more seasonal the business, the more variation in its asset requirements. While short-term credit could theoretically be used to match maturities with the fluctuating level of required current assets, uncertainty about the exact pattern of seasonal flows might dictate a more prudent policy of maintaining some sort of safety stock of liquid assets financed by longer term sources of funds.

21-3 If an asset's life and returns can be positively determined, the maturity of the asset can be matched to the maturity of the liability incurred to finance the asset. This matching will insure that funds are borrowed only for the time they are required to finance the asset and that adequate funds will have been generated by the asset by the time the financing must be repaid.

A basic fallacy is involved in the above discussion, however. Borrowing to finance receivables or inventories may be on a short-term basis because these turn over 8 to 12 times a year. But as a firm's sales grow, its investment in receivables and inventories grow, even though they turn over. Hence, longer term financing should be used to finance the permanent components of receivables and inventory investments.

21-4 From the standpoint of the borrower, short-term credit is riskier because short-term interest rates fluctuate more than long-term rates, and the firm may be unable to repay the debt. If the lender will not extend the loan, the firm could be forced into bankruptcy.

A firm might borrow short-term if it thought that interest rates were going to fall and, therefore, that the long-term rate would go even lower. A firm might also borrow short-term if it were only going to need the money for a short while and the higher interest would be offset by lower administration costs and no prepayment penalty. Thus, firms do consider factors other than interest rates when deciding on the maturity of their debt.
21-5 People or firms borrow on a short-term basis in spite of increased risk for reasons of flexibility. If its need for funds is seasonal or cyclical, a firm may not want to commit itself to long-term debt. Furthermore, short-term interest rates are generally lower than long-term rates.

21-6 This statement is false. A firm cannot ordinarily control its accruals since payrolls and the timing of wage payments are set by economic forces and by industry custom, while tax payment dates are established by law.

21-7 Yes. Trade credit and accruals generally increase automatically as sales increase.

21-8 Yes. If a firm is able to buy on credit at all, if the credit terms include a discount for early payment, and if the firm pays during the discount period, it has obtained "free" trade credit. However, taking additional trade credit by paying after the discount period can be quite costly.

21-9 Larger firms have greater access to the capital markets than smaller firms, because they can sell stocks and bonds. Smaller firms are, therefore, forced to rely on bank loans to a greater extent. In addition, larger firms are typically older and, thus, have had more time to build up retained earnings and other internal sources of funds than new, smaller firms.

21-10 Commercial paper refers to promissory notes of large, strong corporations. These notes have maturities that generally vary from 2 to 6 months, and the return is usually 1% to 3 percentage points below the prime lending rate. Mamma and Pappa Gus could not use the commercial paper market.

21-11 The commercial paper market is completely impersonal, while bank loans are negotiated and the parties involved get to know and trust one another. Commercial paper can be sold only by firms whose credit is utterly above question. Suppose a fundamentally sound firm that uses a good deal of short-term credit in the form of commercial paper is suddenly faced with a crippling strike. This may cause commercial paper dealers to refuse to handle its paper, and, as the already outstanding notes begin to mature, the firm may be faced with a financial crisis. On the other hand, if the firm had maintained continuous banking relations, it is far more likely that its bank would have stuck by it and helped it ride out the storm. It is assumed that the firm did not utilize bank credit earlier. Furthermore, commercial paper maturities vary from 2 to 6 months, and a firm may desire longer-term debt.

21-12 a. Approximately 5.25 to 6.75 percent.

b. A firm may be limited in the amount of commercial paper that dealers are willing to sell, or it may wish to establish relations with a bank. Furthermore, commercial paper maturities vary from 2 to 6 months, and a firm may desire longer-term debt.

Answers and Solutions: 21 - 10
SOLUTIONS TO END-OF-CHAPTER PROBLEMS

21-1 Nominal cost of trade credit = \[ \frac{3}{97} \times \frac{360}{30 - 15} \]
= 0.0309 \times 24 = 0.7423 = 74.23%.

Effective cost of trade credit = \((1.0309)^{34} - 1.0 = 1.0772 = 107.72%.

21-2 Effective cost of trade credit = \((1 + \frac{1}{99})^{34} - 1.0 = 0.0837 = 8.37%.

21-3 Net purchase price of inventory = \$500,000/day.

Credit terms = 2/15, net 40.

\$500,000 \times 15 = \$7,500,000.

21-4 \$25,000 interest-only loan, 11% nominal rate. Interest calculated as simple interest based on 365-day year. Interest for 1st month = ?

Interest rate per day = \(0.11/365 = 0.000301\).

Interest charge for period = \((31)(0.11/365)(\$25,000)
= \$233.56.

21-5 \$15,000 installment loan, 11% nominal rate.
Effective annual rate, assuming a 365-day year = ?

Add-on interest = \(0.11(\$15,000) = \$1,650\).

Monthly Payment = \(\frac{\$15,000 + \$1,650}{12} = \$1,387.50\).

\[
\begin{array}{cccccc}
0 & 1 & 2 & \cdots & 11 & 12 \\
15,000 & -1,387.50 & -1,387.50 & & -1,387.50 & -1,387.50 \\
\end{array}
\]

With a financial calculator, enter N = 12, FV = 15000, PMT = -1387.50, FV = 0, and then press I to obtain 1.6432%. However, this is a monthly rate.

Answers and Solutions: 21 - 11
Effective annual rate_{add-on} = (1 + k_d)^n - 1.0
= (1.016432)^{12} - 1.0
= 1.2160 - 1.0 = 0.2160 = 21.60%.

21-6 a. \[ \frac{1}{99} \times \frac{360}{5} = 72.73\% \]

b. \[ \frac{2}{98} \times \frac{360}{50} = 14.69\% \]

c. \[ \frac{3}{97} \times \frac{360}{35} = 31.81\% \]

d. \[ \frac{2}{98} \times \frac{360}{35} = 20.99\% \]

e. \[ \frac{2}{98} \times \frac{360}{25} = 29.39\% \]

21-7 a. \[ \frac{3}{97} \times \frac{360}{45 - 20} = 44.54\% \]

Because the firm still takes the discount on Day 20, 20 is used as the discount period in calculating the cost of non-free trade credit.

b. Paying after the discount period, but still taking the discount gives the firm more credit than it would receive if it paid within 15 days.

\[ \text{21-8} \]

a. Effective rate = 12%.

b. \[
\begin{array}{c|c|c}
\text{Years} & \text{Cash Flow} \\
\hline
0 & \text{Balance} \\
50,000 & -50,000 \\
-10,000 & -4,500 \\
40,000 & 10,000 \\
\end{array}
\]

With a financial calculator, enter N = 1, FV = 40000, PMT = 0, and FV = -44500 to solve for I = 11.25%.

Note that, if Hawley actually needs $50,000 of funds, he will have to borrow \[ \frac{550,000}{1 - 0.2} = 562,500 \]. The effective interest rate will still be 11.25%.

Answers and Solutions: 21 - 12
c. 0 1 = 7

<table>
<thead>
<tr>
<th>50,000</th>
<th>-50,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>-4,375 (discount interest)</td>
<td>7,500</td>
</tr>
<tr>
<td>-7,500 (compensating balance)</td>
<td>-42,500</td>
</tr>
<tr>
<td><strong>38,125</strong></td>
<td></td>
</tr>
</tbody>
</table>

With a financial calculator, enter N = 1, PV = 38125, PMT = 0, and FV = -42500 to solve for I = 11.4754% = 11.48%.

Note that, if Hawley actually needs $50,000 of funds, he will have to borrow \( \frac{50,000}{1 - 0.0875 - 0.15} = 65,573.77 \). The effective interest rate will still be 11.48%.

d. Approximate annual rate = \( \frac{(0.08)(50,000)}{(50,000/2)} = \frac{4,000}{25,000} = 16\% \).

Precise effective rate:

\[
\text{Effective rate: } \sum_{i=1}^{12} \frac{\$4,166.67}{(1 + k_d)^i} + \frac{\$4,000}{(1 + k_d)^{12}}
\]

\( k_d \), the monthly interest rate, is 1.1326%, found with a financial calculator. Input N = 12; PV = 50000; PMT = -4166.67; FV = -4000; and I = 7. The precise effective annual rate is \((1.011326)^{12} - 1.0 = 14.47\% \).

Alternative b has the lowest effective interest rate.

21-9 Sales per day = \( \frac{\$4,500,000}{360} = \$12,500 \).

Discount sales = 0.5(\$12,500) = \$6,250.

A/R attributable to discount customers = \$6,250(10) = \$62,500.

A/R attributable to nondiscount customers:

| Total A/R | \$437,500 |
| Discount customers' A/R | \$62,500 |
| Nondiscount customers' A/R | \$375,000 |

Days sales outstanding = \( \frac{\$375,000}{\$6,250} = 60 \) days.

Answers and Solutions: 21-13
21-11 a. Simple interest: 12%.

b. 3-months: \( (1 + 0.115/4)^4 - 1 = 12.0055\% \), or use the interest conversion feature of your calculator as follows:

\[ \text{NOM\%} = 11.5; \ P/YR = 4; \ \text{EFF\%} = ? \ \text{EFF\%} = 12.0055\% . \]

c. Add-on: Interest = Funds needed\((k_d)\).

\[ \text{Loan} = \text{Funds needed} \cdot (1 + k_d) . \]

\[ \text{PMT} = \frac{\text{Loan}}{12} . \]

Assume you borrowed $100. Then, Loan = $100(1.06) = $106. PMT = $106/12 = $8.8333.

\[ $100 = \sum_{i=1}^{12} \frac{8.8333}{(1 + k_d)^i} . \]

Enter \( N = 12, \ PV = 100, \ PMT = -8.8333, \ FV = 0, \) and press I to get \( I = 0.908032\% = k_d. \) This is a monthly periodic rate, so the effective annual rate = \( (1.00908032)^{12} - 1 = 0.1146 = 11.46\%. \)

d. Trade credit: \( 1/99 - 1.01\% \) on discount if pay in 15 days, otherwise pay 45 days later. So, get 60 - 15 = 45 days of credit at a cost of \( 1/99 = 1.01\%. \) There are 360/45 = 8 periods, so the effective cost rate is:

\[ (1 + 1/99)^8 - 1 = (1.0101)^8 - 1 = 8.3723\% . \]

Thus, the least expensive type of credit for Yonge is trade credit with an effective cost of 8.3723 percent.

21-12 a. Average accounts payable = \$360,000 \times 10 \text{ days} = \$10,000 \times 10 = \$100,000.

\[ \frac{360 \text{ days}}{} \]

b. There is no cost of trade credit at this point. The firm is using "free" trade credit.

c. Average payables \[ = \frac{3600000}{360} \times 30 = \$10,000 \times 30 = \$300,000. \]

Nominal cost = \( (2/98)(360/20) = 36.73\%, \)

or \( 73,469/(300,000 - 100,000) = 36.73\%. \)

Effective cost = \( (1 + 2/98)^{360/20} - 1 = 0.4386 = 43.86\%. \)

Answers and Solutions: 21 - 15
d. Nominal rate = \( \frac{2}{98} \times \frac{360}{40 - 10} \) = 24.49%.

Effective cost = \((1 + 2/98)^{360/35} - 1\) = 0.2743 = 27.43%.

21-13 a. Bank Loan 13%, discount interest

\[
\begin{array}{c|c|c|c}
\text{0} & \text{i = ?} & \text{1} & \text{1} \\
300,000 & -300,000 & -39,000 & \text{discount interest} \\
\hline
261,000 & & & \\
\end{array}
\]

With a financial calculator, enter N = 1, PV = 261000, PMT = 0, and FV = -300000 to solve for I = 14.9425% = 14.94%.

Note that, if Thompson actually needs $300,000 of funds, it will have to borrow \( \frac{300000}{1 - 0.13} \) = $344,827.59. The effective interest rate will still be 14.9425% = 14.94%.

Trade Credit

Terms: 2/10, net 30. But the firm plans delaying payments 35 additional days, which is the equivalent of 2/10, net 65.

Nominal cost = \( \frac{\text{Discount percent} \times 360}{100 - \text{Discount percent} \text{ Days credit is outstanding} \text{ Discount period}} \)

\[= \frac{2 \times 360}{100 - 2 \times 65 - 10} = \frac{2 \times 360}{98 \times 55} = 0.0204(6.55) = 13.36\%.
\]

Effective cost = \((1 + 2/98)^{360/35} - 1\) = 14.14%.

Just comparing effective interest costs, the Thompson Corporation might be tempted to obtain financing from trade credit.

b. The interest rate comparison had favored trade credit, but Thompson Corporation should take into account how its trade creditors would look upon a 35-day delay in making payments. Thompson would become a "slow pay" account, and in times when suppliers were operating at full capacity, Thompson would be given poor service and would also be forced to pay on time.

21-14 a. Size of bank loan = (Purchases/Day)(Days late)

\[= \left( \frac{\text{Purchases}}{\text{Days payables outstanding}} \right) \times (\text{Days outstanding} - 30) \]

\[= \left( \frac{\$600,000}{60} \right) (60 - 30) = \$10,000(30) = \$300,000. \]

Answers and Solutions: 21-15
ANSWERS TO END-OF-CHAPTER QUESTIONS

22-1

a. The Baumol model is a model for establishing the firm's target cash balance that closely resembles the EOQ model used for inventory. The model assumes (1) that the firm uses cash at a steady, predictable rate, (2) that the firm's cash inflows from operations also occur at a steady, predictable rate, and (3) that its net cash outflows therefore also occur at a steady rate. The model balances the opportunity cost of holding cash against the transactions costs associated with replenishing the cash account.

b. Carrying costs are the costs of carrying inventory. Ordering costs are the costs of ordering inventory. Total inventory costs are the sum of ordering and carrying costs.

c. The Economic Ordering Quantity (EOQ) is the order quantity that minimizes the costs of ordering and carrying inventories. The EOQ model is the equation used to find the EOQ. The range around the optimal ordering quantity that may be ordered without significantly affecting total inventory costs is the EOQ range.

d. The reorder point is the inventory level at which a new order is placed. Safety stock is inventory held to guard against larger-than-normal sales and/or shipping delays.

e. An aging schedule breaks down accounts receivable according to how long they have been outstanding. This gives the firm a more complete picture of the structure of accounts receivable than that provided by days sales outstanding. Days sales outstanding (DSO) is a measure of the average length of time it takes a firm's customers to pay off their credit purchases.

f. The payments pattern approach is a procedure which measures any changes that might occur in customers' payment behavior. The advantage of this approach is that it is not affected by changes in sales levels due to cyclical or seasonal factors. The uncollected balances schedule, which is an integral part of the payments pattern approach, helps a firm monitor its receivables better and also forecast future receivables balances.

22-2

a. Our suppliers switch from delivering by train to air freight.

b. We change from producing just in time to meet seasonal sales to steady, year-round production.

c. Competition in the markets in which we sell increases.

Answers and Solutions: 22 - 4