### SOLUTIONS TO END-OF-CHAPTER PROBLEMS

#### 22-1 Analysis of Change:

<table>
<thead>
<tr>
<th></th>
<th>Projected Income Statement</th>
<th>Effect of Credit Policy Change</th>
<th>Projected Income Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Under Current Credit Policy</td>
<td></td>
<td>Under New Credit Policy</td>
</tr>
<tr>
<td>Gross sales</td>
<td>$1,600,000</td>
<td>+$ 25,000</td>
<td>$1,625,000</td>
</tr>
<tr>
<td>Less: Discounts</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Net sales</td>
<td>$1,600,000</td>
<td>+$ 25,000</td>
<td>$1,625,000</td>
</tr>
<tr>
<td>Variable costs</td>
<td>1,200,000</td>
<td>+ 18,750</td>
<td>1,218,750</td>
</tr>
<tr>
<td>Profit before credit costs and taxes</td>
<td>$ 400,000</td>
<td>+$ 6,250</td>
<td>$ 406,250</td>
</tr>
<tr>
<td>Credit-related costs:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost of carrying receivables*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collection expense</td>
<td>16,000</td>
<td>+ 8,375</td>
<td>24,375</td>
</tr>
<tr>
<td>Bad debt losses</td>
<td>35,000</td>
<td>- 13,000</td>
<td>22,000</td>
</tr>
<tr>
<td></td>
<td>24,000</td>
<td>+ 16,625</td>
<td>40,625</td>
</tr>
<tr>
<td>Profit before taxes</td>
<td>$ 325,000</td>
<td>-$ 5,750</td>
<td>$ 319,250</td>
</tr>
<tr>
<td>Taxes (40%)</td>
<td>130,000</td>
<td>- 2,300</td>
<td>127,700</td>
</tr>
<tr>
<td>Net income</td>
<td>$ 195,000</td>
<td>-$ 3,450</td>
<td>$ 191,550</td>
</tr>
</tbody>
</table>

*Cost of carrying receivables:

\[
\text{DSC} = \left( \frac{\text{Sales}}{\text{per day}} \right) \times \frac{\text{Variable cost ratio}}{\text{funds}}.
\]

Current policy = \((30) \left( \frac{\$1,600,000}{360} \right) (0.75) (0.16) = \$16,000.\)

New policy = \((45) \left( \frac{\$1,625,000}{360} \right) (0.75) (0.16) = \$24,375.\)

Since the change in profitability is negative, the firm should not relax its collection efforts.

#### 22-2

a. \(\text{EOQ} = \sqrt{\frac{2 \times 15 \times 9,000,000}{(0.2)(1.5)}} = \sqrt{9,000,000} = 3,000 \text{ bags per order}.\)

b. The maximum inventory, which is on hand immediately after a new order is received, is 4,000 bags \((3,000 + 1,000 \text{ safety stock})\). At $1.50 per bag the dollar cost is $6,000.

c. \(\text{Average inventory} = \frac{3,000 + 1,000}{2} = 1,500 + 1,000 = 2,500 \text{ bags or } \$3,750.\)

Answers and Solutions: 22 - 6
22-4 a. March receivables = $120,000(0.8) + $100,000(0.5) = $146,000.
    June receivables = $160,000(0.8) + $140,000(0.5) = $198,000.

b. 1st Quarter: ADS = ($50,000 + $100,000 + $120,000)/90 = $3,000.
    DSO = $146,000/$3,000 = 48.7 days.

2nd Quarter: ADS = ($105,000 + $140,000 + $160,000)/90 = $4,500.
    DSO = $198,000/$4,500 = 44.0 days.

Cumulative: ADS = ($50,000 + $100,000 + $120,000 + $105,000 + $140,000 + $160,000)/180 = $3,750,
    DSO = $198,000/$3,750 = 52.8 days.

c. Age of Accounts        Dollar Value        Percent of Total
    0 - 30 days            $128,000        65%
    31 - 60                70,000         35%
    61 - 90                0              0%
    $198,000

d. Month     Sales        Receivables        Receivables/Sales
              $105,000      $9          0%          
              140,000      70,000       50%
              160,000      128,000      80%
    $158,000

22-5 a. \[ C^* = \sqrt{\frac{2TF}{kT}} = \text{Optimal transaction size} \]

\[ F = 27; T = 4,500,000; k = 12\% \]

\[ C^* = \sqrt{\frac{2(27)(4,500,000)}{0.12}} = 45,000. \]

b. Average cash balance = $45,000/2 = $22,500.

c. Transfers per year = $4,500,000/$45,000 = 100, or one approximately every 3.6 = 4 days.

Answers and Solutions: 22 - 8
d. Total cost = \( \frac{C^*}{2} (k) + \frac{T}{C^*} (F) \)
   
   \[
   = \frac{\$45,000}{2} (0.12) + \frac{\$45,000}{\$45,000} (\$27)
   \]
   
   \[
   = \frac{\$2,700}{2} + \$2,700 = \$5,400.
   \]

If it maintained an average balance of \$50,000, this would mean transfers of \$100,000. There would be \$4,500,000/\$100,000 = 45 transfers per year. The cost would be \(0.12(\$50,000) + 45(\$27)\) = \$7,215. If it maintained a zero balance, it would have to make 360 transfers per year, so its cost would be \(360(\$27) = \$9,720\).