CHAPTER 3
WORKING WITH FINANCIAL STATEMENTS

Answers to Concepts Review and Critical Thinking Questions

1.  
   a. If inventory is purchased with cash, then there is no change in the current ratio. If inventory is purchased on credit, then there is a decrease in the current ratio if it was initially greater than 1.0.  
   b. Reducing accounts payable with cash increases the current ratio if it was initially greater than 1.0.  
   c. Reducing short-term debt with cash increases the current ratio if it was initially greater than 1.0.  
   d. As long-term debt approaches maturity, the principal repayment and the remaining interest expense become current liabilities. Thus, if debt is paid off with cash, the current ratio increases if it was initially greater than 1.0. If the debt has not yet become a current liability, then paying it off will reduce the current ratio since current liabilities are not affected.  
   e. Reduction of accounts receivables and an increase in cash leaves the current ratio unchanged.  
   f. Inventory sold at cost reduces inventory and raises cash, so the current ratio is unchanged.  
   g. Inventory sold for a profit raises cash in excess of the inventory recorded at cost, so the current ratio increases.

2. The firm has increased inventory relative to other current assets; therefore, assuming current liability levels remain unchanged, liquidity has potentially decreased.

3. A current ratio of 0.50 means that the firm has twice as much in current liabilities as it does in current assets; the firm potentially has poor liquidity. If pressed by its short-term creditors and suppliers for immediate payment, the firm might have a difficult time meeting its obligations. A current ratio of 1.50 means the firm has 50% more current assets than it does current liabilities. This probably represents an improvement in liquidity; short-term obligations can generally be met completely with a safety factor built in. A current ratio of 15.0, however, might be excessive. Any excess funds sitting in current assets generally earn little or no return. These excess funds might be put to better use by investing in productive long-term assets or distributing the funds to shareholders.

4.  
   a. Quick ratio provides a measure of the short-term liquidity of the firm, after removing the effects of inventory, generally the least liquid of the firm’s current assets.  
   b. Cash ratio represents the ability of the firm to completely pay off its current liabilities with its most liquid asset (cash).  
   c. Total asset turnover measures how much in sales is generated by each dollar of firm assets.  
   d. Equity multiplier represents the degree of leverage for an equity investor of the firm; it measures the dollar worth of firm assets each equity dollar has a claim to.  
   e. Long-term debt ratio measures the percentage of total firm capitalization funded by long-term debt.
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f. Times interest earned ratio provides a relative measure of how well the firm’s operating earnings can cover current interest obligations.

g. Profit margin is the accounting measure of bottom-line profit per dollar of sales.

h. Return on assets is a measure of bottom-line profit per dollar of total assets.

i. Return on equity is a measure of bottom-line profit per dollar of equity.

j. Price-earnings ratio reflects how much value per share the market places on a dollar of accounting earnings for a firm.

5. Common-size financial statements express all balance sheet accounts as a percentage of total assets and all income statement accounts as a percentage of total sales. Using these percentage values rather than nominal dollar values facilitates comparisons between firms of different size or business type. Common-base year financial statements express each account as a ratio between their current year nominal dollar value and some reference year nominal dollar value. Using these ratios allows the total growth trend in the accounts to be measured.

6. Peer group analysis involves comparing the financial ratios and operating performance of a particular firm to a set of peer group firms in the same industry or line of business. Comparing a firm to its peers allows the financial manager to evaluate whether some aspects of the firm’s operations, finances, or investment activities are out of line with the norm, thereby providing some guidance on appropriate actions to take to adjust these ratios if appropriate. An aspirant group would be a set of firms whose performance the company in question would like to emulate. The financial manager often uses the financial ratios of aspirant groups as the target ratios for his or her firm; some managers are evaluated by how well they match the performance of an identified aspirant group.

7. Return on equity is probably the most important accounting ratio that measures the bottom-line performance of the firm with respect to the equity shareholders. The Du Pont identity emphasizes the role of a firm’s profitability, asset utilization efficiency, and financial leverage in achieving an ROE figure. For example, a firm with ROE of 20% would seem to be doing well, but this figure may be misleading if it were marginally profitable (low profit margin) and highly levered (high equity multiplier). If the firm’s margins were to erode slightly, the ROE would be heavily impacted.

8. The book-to-bill ratio is intended to measure whether demand is growing or falling. It is closely followed because it is a barometer for the entire high-tech industry where levels of revenues and earnings have been relatively volatile.

9. If a company is growing by opening new stores, then presumably total revenues would be rising. Comparing total sales at two different points in time might be misleading. Same-store sales control for this by only looking at revenues of stores open within a specific period.

10. a. For an electric utility such as Con Ed, expressing costs on a per-kilowatt-hour basis would be a way to compare costs with other utilities of different sizes.

b. For a retailer such as Sears, expressing sales on a per-square-foot basis would be useful in comparing revenue production against other retailers.

c. For an airline such as Southwest, expressing costs on a per-passenger-mile basis allows for comparisons with other airlines by examining how much it costs to fly one passenger one mile.
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d. For an online service provider such as Comcast, using a per internet session for costs would allow for comparisons with smaller services. A per subscriber basis would also make sense.

e. For a hospital such as Holy Cross, revenues and costs expressed on a per-bed basis would be useful.

f. For a college textbook publisher such as McGraw-Hill/Irwin, the leading publisher of finance textbooks for the college market, the obvious standardization would be per book sold.

11. Reporting the sale of Treasury securities as cash flow from operations is an accounting “trick,” and as such, should constitute a possible red flag about the companies accounting practices. For most companies, the gain from a sale of securities should be placed in the financing section. Including the sale of securities in the cash flow from operations would be acceptable for a financial company, such as an investment or commercial bank.

12. Increasing the payables period increases the cash flow from operations. This could be beneficial for the company as it may be a cheap form of financing, but it is basically a one-time change. The payables period cannot be increased indefinitely as it will negatively affect the company’s credit rating if the payables period becomes too long.

Solutions to Questions and Problems

NOTE: All end of chapter problems were solved using a spreadsheet. Many problems require multiple steps. Due to space and readability constraints, when these intermediate steps are included in this solutions manual, rounding may appear to have occurred. However, the final answer for each problem is found without rounding during any step in the problem.

Basic

1. Using the formula for NWC, we get:

   \[ NWC = CA - CL \]
   \[ CA = CL + NWC = 2,710 + 3,950 = 6,660 \]

   So, the current ratio is:
   \[ \text{Current ratio} = \frac{CA}{CL} = \frac{6,660}{3,950} = 1.69 \text{ times} \]

   And the quick ratio is:
   \[ \text{Quick ratio} = \frac{(CA - \text{Inventory})}{CL} = \frac{(6,660 - 3,420)}{3,950} = 0.82 \text{ times} \]

2. We need to find net income first. So:

   \[ \text{Profit margin} = \frac{\text{Net income}}{\text{Sales}} \]
   \[ \text{Net income} = \text{Sales}(\text{Profit margin}) \]
   \[ \text{Net income} = (18,000,000)(0.08) = 1,440,000 \]

   \[ \text{ROA} = \frac{\text{Net income}}{\text{TA}} = \frac{1,440,000}{15,600,000} = 0.0923, \text{ or } 9.23\% \]
To find ROE, we need to find total equity. Since TL & OE equals TA:
\[ TA = TD + TE \]
\[ TE = TA – TD \]
\[ TE = $15,600,000 - 6,300,000 = $9,300,000 \]

\[ \text{ROE} = \frac{\text{Net income}}{\text{TE}} = \frac{1,440,000}{9,300,000} = 0.1548, \text{ or } 15.48\% \]

3. Receivables turnover = Sales / Receivables
   Receivables turnover = $4,238,720 / $327,815 = 12.93 times

   Days’ sales in receivables = 365 days / Receivables turnover = 365 / 12.93 = 28.23 days

   The average collection period for an outstanding accounts receivable balance was 28.23 days.

4. Inventory turnover = COGS / Inventory
   Inventory turnover = $4,285,131 / $483,167 = 8.87 times

   Days’ sales in inventory = 365 days / Inventory turnover = 365 / 8.87 = 41.16 days

   On average, a unit of inventory sat on the shelf 41.16 days before it was sold.

5. Total debt ratio = 0.46 = TD / TA

   Substituting total debt plus total equity for total assets, we get:
   \[ 0.46 = \frac{TD}{TD + TE} \]

   Solving this equation yields:
   \[ 0.46(TE) = 0.54(TD) \]

   Debt/equity ratio = TD / TE = 0.46 / 0.54 = 0.85

   Equity multiplier = 1 + D/E = 1.85

5. Net income = Addition to RE + Dividends = $375,000 + 175,000 = $550,000

   Earnings per share = NI / Shares = $550,000 / 145,000 = $3.79 per share

   Dividends per share = Dividends / Shares = $175,000 / 145,000 = $1.21 per share

   Book value per share = TE / Shares = $4,800,000 / 145,000 = $33.10 per share

   Market-to-book ratio = Share price / BVPS = $79 / $33.10 = 2.39 times

   P/E ratio = Share price / EPS = $79 / $3.79 = 20.83 times

   Sales per share = Sales / Shares = $4,700,000 / 145,000 = $32.41

   P/S ratio = Share price / Sales per share = $79 / $32.41 = 2.44 times
7. \[
\text{ROE} = (\text{PM})(\text{TAT})(\text{EM})
\]
\[
\text{ROE} = (.055)(1.80)(1.45) = .1436, \text{ or } 14.36\%
\]

8. This question gives all of the necessary ratios for the DuPont Identity except the equity multiplier, so, using the DuPont Identity:

\[
\text{ROE} = (\text{PM})(\text{TAT})(\text{EM})
\]
\[
\text{ROE} = .1914 = (.046)(2.30)(\text{EM})
\]
\[
\text{EM} = .1914 / (.046)(2.30) = 1.81
\]
\[
\text{D/E} = \text{EM} - 1 = 1.81 - 1 = 0.81
\]

9. Decrease in inventory is a source of cash
Decrease in accounts payable is a use of cash
Increase in notes payable is a source of cash
Increase in accounts receivable is a use of cash
Change in cash = sources – uses = $430 – 165 + 150 – 180 = $235
Cash increased by $235

10. Payables turnover = COGS / Accounts payable
Payables turnover = $43,821 / $7,843 = 5.59 times

\[
\text{Days’ sales in payables} = 365 \text{ days} / \text{Payables turnover}
\]
\[
\text{Days’ sales in payables} = 365 / 5.59 = 65.33 \text{ days}
\]

The company left its bills to suppliers outstanding for 65.33 days on average. A large value for this ratio could imply that either (1) the company is having liquidity problems, making it difficult to pay off its short-term obligations, or (2) that the company has successfully negotiated lenient credit terms from its suppliers.

11. First, we need the enterprise value, which is:

\[
\text{Enterprise value} = \text{Market capitalization} + \text{Debt} - \text{Cash}
\]
\[
\text{Enterprise value} = $580,000 + 190,000 - 35,000
\]
\[
\text{Enterprise value} = $735,000
\]

And EBITDA is:

\[
\text{EBITDA} = \text{EBIT} + \text{Depreciation} & \text{Amortization}
\]
\[
\text{EBITDA} = $91,000 + 135,000
\]
\[
\text{EBITDA} = $226,000
\]

So, the enterprise value-EBITDA multiple is:

\[
\text{Enterprise value-EBITDA multiple} = $735,000 / $226,000
\]
\[
\text{Enterprise value-EBITDA multiple} = 3.25 \text{ times}
\]
12. The equity multiplier is:

\[ EM = 1 + \frac{D}{E} \]
\[ EM = 1 + 0.80 = 1.80 \]

One formula to calculate return on equity is:

\[ ROE = (ROA)(EM) \]
\[ ROE = 0.079(1.80) = 0.1422, \text{ or } 14.22\% \]

ROE can also be calculated as:

\[ ROE = \frac{NI}{TE} \]

So, net income is:

\[ NI = ROE(TE) \]
\[ NI = (0.1422)(480,000) = 68,256 \]

13. through 15:

<table>
<thead>
<tr>
<th>Assets</th>
<th>2011</th>
<th>#13</th>
<th>2012</th>
<th>#13</th>
<th>#14</th>
<th>#15</th>
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<tbody>
<tr>
<td>Current assets</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash</td>
<td>$9,279</td>
<td>2.67%</td>
<td>$11,173</td>
<td>2.93%</td>
<td>1.2041</td>
<td>1.0964</td>
</tr>
<tr>
<td>Accounts receivable</td>
<td>23,683</td>
<td>6.81%</td>
<td>25,760</td>
<td>6.75%</td>
<td>1.0877</td>
<td>0.9904</td>
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<tr>
<td>Inventory</td>
<td>42,636</td>
<td>12.26%</td>
<td>46,915</td>
<td>12.29%</td>
<td>1.1004</td>
<td>1.0019</td>
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<tr>
<td>Total</td>
<td>$75,598</td>
<td>21.75%</td>
<td>$83,848</td>
<td>21.96%</td>
<td>1.1091</td>
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<tr>
<td>Fixed assets</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net plant and equipment</td>
<td>$272,047</td>
<td>78.25%</td>
<td>$297,967</td>
<td>78.04%</td>
<td>1.0953</td>
<td>0.9973</td>
</tr>
<tr>
<td>Total assets</td>
<td>$347,645</td>
<td>100%</td>
<td>$381,815</td>
<td>100%</td>
<td>1.0983</td>
<td>1.0000</td>
</tr>
</tbody>
</table>

| Liabilities and Owners’ Equity |       |      |       |      |      |      |
| Current liabilities |       |      |       |      |      |      |
| Accounts payable | $41,060 | 11.81% | $43,805 | 11.47% | 1.0669 | 0.9714 |
| Notes payable | 16,157 | 4.65% | 16,843 | 4.41% | 1.0425 | 0.9492 |
| Total | $57,217 | 16.46% | $60,648 | 15.88% | 1.0600 | 0.9651 |
| Long-term debt | $40,000 | 11.51% | $35,000 | 9.17% | 0.8750 | 0.7967 |
| Owners’ equity |       |      |       |      |      |      |
| Common stock and paid-in surplus | $50,000 | 14.38% | $50,000 | 13.10% | 1.0000 | 0.9105 |
| Accumulated retained earnings | 200,428 | 57.65% | 236,167 | 61.85% | 1.1783 | 1.0729 |
| Total | $250,428 | 72.04% | $286,167 | 74.95% | 1.1427 | 1.0404 |
| Total liabilities and owners’ equity | $347,645 | 100% | $381,815 | 100% | 1.0983 | 1.0000 |
The common-size balance sheet answers are found by dividing each category by total assets. For example, the cash percentage for 2011 is:

$9,279 / $347,645 = .0267, or 2.67%

This means that cash is 2.67% of total assets.

The common-base year answers for Question 14 are found by dividing each category value for 2012 by the same category value for 2011. For example, the cash common-base year number is found by:

$11,173 / $9,279 = 1.2041

This means the cash balance in 2012 is 1.2041 times as large as the cash balance in 2011.

The common-size, common-base year answers for Question 15 are found by dividing the common-size percentage for 2012 by the common-size percentage for 2011. For example, the cash calculation is found by:

2.93% / 2.67% = 1.0964

This tells us that cash, as a percentage of assets, increased by 9.64%.

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>Sources/Uses</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assets</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current assets</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash</td>
<td>$9,279</td>
<td>$1,894 U</td>
<td>$11,173</td>
</tr>
<tr>
<td>Accounts receivable</td>
<td>23,683</td>
<td>2,077 U</td>
<td>25,760</td>
</tr>
<tr>
<td>Inventory</td>
<td>42,636</td>
<td>4,279 U</td>
<td>46,915</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$75,598</td>
<td>$8,250 U</td>
<td>$83,848</td>
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<tr>
<td>Fixed assets</td>
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</tr>
<tr>
<td>Net plant and equipment</td>
<td>$272,047</td>
<td>$25,920 U</td>
<td>$297,967</td>
</tr>
<tr>
<td><strong>Total assets</strong></td>
<td>$347,645</td>
<td>$34,170 U</td>
<td>$381,815</td>
</tr>
<tr>
<td><strong>Liabilities and Owners’ Equity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current liabilities</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Accounts payable</td>
<td>$41,060</td>
<td>$2,745 S</td>
<td>$43,805</td>
</tr>
<tr>
<td>Notes payable</td>
<td>16,157</td>
<td>686 S</td>
<td>16,843</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$57,217</td>
<td>$3,431 S</td>
<td>$60,648</td>
</tr>
<tr>
<td>Long-term debt</td>
<td>$40,000</td>
<td>$(5,000) U</td>
<td>$35,000</td>
</tr>
<tr>
<td>Owners' equity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common stock and paid-in surplus</td>
<td>$50,000</td>
<td>0</td>
<td>$50,000</td>
</tr>
<tr>
<td>Accumulated retained earnings</td>
<td>200,428</td>
<td>35,739 S</td>
<td>236,167</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$250,428</td>
<td>$35,739 S</td>
<td>$286,167</td>
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</table>
Total liabilities and owners' equity

<table>
<thead>
<tr>
<th></th>
<th>$347,645</th>
<th>$34,170</th>
<th>S</th>
<th>$381,815</th>
</tr>
</thead>
</table>

The firm used $34,170 in cash to acquire new assets. It raised this amount of cash by increasing liabilities and owners’ equity by $34,170. In particular, the needed funds were raised by internal financing (on a net basis), out of the additions to retained earnings, and an increase in current liabilities.

17.  

a. Current ratio  
   \[ \text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}} \]
   
   Current ratio 2011  
   \[ \frac{$75,598}{$57,217} = 1.32 \text{ times} \]
   
   Current ratio 2012  
   \[ \frac{$83,848}{$60,648} = 1.38 \text{ times} \]

b. Quick ratio  
   \[ \text{Quick ratio} = \frac{(\text{Current assets} - \text{Inventory})}{\text{Current liabilities}} \]
   
   Quick ratio 2011  
   \[ \frac{$75,598 - 42,636}{$57,217} = 0.58 \text{ times} \]
   
   Quick ratio 2012  
   \[ \frac{$83,848 - 46,915}{$60,648} = 0.61 \text{ times} \]

c. Cash ratio  
   \[ \text{Cash ratio} = \frac{\text{Cash}}{\text{Current liabilities}} \]
   
   Cash ratio 2011  
   \[ \frac{$9,279}{$57,217} = 0.16 \text{ times} \]
   
   Cash ratio 2012  
   \[ \frac{$11,173}{$60,648} = 0.18 \text{ times} \]

d. NWC ratio  
   \[ \text{NWC ratio} = \frac{\text{NWC}}{\text{Total assets}} \]
   
   NWC ratio 2011  
   \[ \frac{$75,598 - 57,217}{$347,645} = 5.29\% \]
   
   NWC ratio 2012  
   \[ \frac{$83,848 - 60,648}{$381,815} = 6.08\% \]

e. Debt-equity ratio  
   \[ \text{Debt-equity ratio} = \frac{\text{Total debt}}{\text{Total equity}} \]
   
   Debt-equity ratio 2011  
   \[ \frac{$57,217 + 40,000}{$250,428} = 0.39 \text{ times} \]
   
   Debt-equity ratio 2012  
   \[ \frac{$60,648 + 35,000}{$286,167} = 0.33 \text{ times} \]

   Equity multiplier  
   \[ \text{Equity multiplier} = 1 + \frac{\text{D/E}}{\text{S}} \]
   
   Equity multiplier 2011  
   \[ 1 + 0.39 = 1.39 \]
   
   Equity multiplier 2012  
   \[ 1 + 0.33 = 1.33 \]

f. Total debt ratio  
   \[ \text{Total debt ratio} = \frac{(\text{Total assets} - \text{Total equity})}{\text{Total assets}} \]
   
   Total debt ratio 2011  
   \[ \frac{$347,645 - 250,428}{$347,645} = 0.28 \text{ times} \]
   
   Total debt ratio 2012  
   \[ \frac{$381,815 - 286,167}{$381,815} = 0.25 \text{ times} \]

   Long-term debt ratio  
   \[ \text{Long-term debt ratio} = \frac{\text{Long-term debt}}{(\text{Long-term debt} + \text{Total equity})} \]
   
   Long-term debt ratio 2011  
   \[ \frac{$40,000}{($40,000 + 250,428)} = 0.14 \text{ times} \]
   
   Long-term debt ratio 2012  
   \[ \frac{$35,000}{($35,000 + 286,167)} = 0.11 \text{ times} \]

Intermediate

18. This is a multistep problem involving several ratios. The ratios given are all part of the DuPont Identity. The only DuPont Identity ratio not given is the profit margin. If we know the profit margin, we can find the net income since sales are given. So, we begin with the DuPont Identity:

   \[ \text{ROE} = 0.13 = (\text{PM}) \frac{\text{TAT}}{\text{EM}} = (\text{PM}) \frac{\text{S}}{\text{TA}} (1 + \text{D/E}) \]

Solving the DuPont Identity for profit margin, we get:

   \[ \text{PM} = \frac{[(\text{ROE}) \text{TA}]}{[(1 + \text{D/E}) \text{S}]} \]
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PM = [(0.13)(2,805)] / [(1 + 1.4)(6,189)] = .0245

Now that we have the profit margin, we can use this number and the given sales figure to solve for net income:

PM = .0245 = NI / S
NI = .0245(6,189) = 151.94

19. This is a multistep problem involving several ratios. It is often easier to look backward to determine where to start. We need receivables turnover to find days’ sales in receivables. To calculate receivables turnover, we need credit sales, and to find credit sales, we need total sales. Since we are given the profit margin and net income, we can use these to calculate total sales as:

PM = 0.083 = NI / Sales = 179,000 / Sales; Sales = 2,156,627

Credit sales are 70 percent of total sales, so:

Credit sales = 2,156,627(0.70) = 1,509,639

Now we can find receivables turnover by:

Receivables turnover = Credit sales / Accounts receivable = 1,509,639 / 118,370 = 12.75 times

Days’ sales in receivables = 365 days / Receivables turnover = 365 / 12.75 = 28.62 days

20. The solution to this problem requires a number of steps. First, remember that CA + NFA = TA. So, if we find the CA and the TA, we can solve for NFA. Using the numbers given for the current ratio and the current liabilities, we solve for CA:

CR = CA / CL
CA = CR(CL) = 1.30(910) = 1,183

To find the total assets, we must first find the total debt and equity from the information given. So, we find the sales using the profit margin:

PM = NI / Sales
NI = PM(Sales) = .095(6,430) = 610.85

We now use the net income figure as an input into ROE to find the total equity:

ROE = NI / TE
TE = NI / ROE = 610.85 / .185 = 3,301.89

Next, we need to find the long-term debt. The long-term debt ratio is:

Long-term debt ratio = 0.35 = LTD / (LTD + TE)

Inverting both sides gives:

1 / 0.35 = (LTD + TE) / LTD = 1 + (TE / LTD)
Substituting the total equity into the equation and solving for long-term debt gives the following:

\[
2.857 = 1 + (3,301.89 / \text{LTD})
\]
\[
\text{LTD} = 3,301.89 / 1.857 = 1,777.94
\]

Now, we can find the total debt of the company:

\[
\text{TD} = \text{CL} + \text{LTD} = 910 + 1,777.94 = 2,687.94
\]

And, with the total debt, we can find the TD&E, which is equal to TA:

\[
\text{TA} = \text{TD} + \text{TE} = 3,301.89 + 2,687.94 = 5,989.83
\]

And finally, we are ready to solve the balance sheet identity as:

\[
\text{NFA} = \text{TA} – \text{CA} = 5,989.83 – 1,183 = 4,806.83
\]

21. Child: Profit margin = \(\frac{\text{NI}}{\text{S}} = \frac{2}{50} = .04\), or 4%

Store: Profit margin = \(\frac{\text{NI}}{\text{S}} = \frac{13,600,000}{680,000,000} = .02\), or 2%

The advertisement is referring to the store’s profit margin, but a more appropriate earnings measure for the firm’s owners is the return on equity.

\[
\text{ROE} = \frac{\text{NI}}{\text{TE}} = \frac{\text{NI}}{(\text{TA} – \text{TD})}
\]
\[
\text{ROE} = \frac{16,800,000}{(410,000,000 – 280,000,000)} = .1046, \text{ or } 10.46\%
\]

22. The solution requires substituting two ratios into a third ratio. Rearranging D/TA:

<table>
<thead>
<tr>
<th>Firm A</th>
<th>Firm B</th>
</tr>
</thead>
<tbody>
<tr>
<td>D / TA = .45</td>
<td>D / TA = .35</td>
</tr>
<tr>
<td>(TA – E) / TA = .45</td>
<td>(TA – E) / TA = .35</td>
</tr>
<tr>
<td>(TA / TA) – (E / TA) = .45</td>
<td>(TA / TA) – (E / TA) = .35</td>
</tr>
<tr>
<td>1 – (E / TA) = .45</td>
<td>1 – (E / TA) = .35</td>
</tr>
<tr>
<td>E / TA = .55</td>
<td>E / TA = .65</td>
</tr>
<tr>
<td>E = .55(TA)</td>
<td>E = .65(TA)</td>
</tr>
</tbody>
</table>

Rearranging ROA, we find:

\[
\text{NI} / \text{TA} = .09
\]
\[
\text{NI} = .09(\text{TA})
\]
\[
\text{NI} / \text{TA} = .12
\]
\[
\text{NI} = .12(\text{TA})
\]

Since \(\text{ROE} = \frac{\text{NI}}{\text{E}}\), we can substitute the above equations into the ROE formula, which yields:

\[
\text{ROE} = \frac{.09(\text{TA})}{.55(\text{TA})} = .09 / .55 = 16.36\%
\]
\[
\text{ROE} = \frac{.12(\text{TA})}{.65 (\text{TA})} = .12 / .65 = 18.46\%
\]
23. This problem requires you to work backward through the income statement. First, recognize that Net income = (1 – \( t \))EBT. Plugging in the numbers given and solving for EBT, we get:

\[
EBT = \frac{15,185}{1 - 0.34} = 23,007.58
\]

Now, we can add interest to EBT to get EBIT as follows:

\[
EBIT = EBT + \text{Interest paid} = 23,007.58 + 3,806 = 26,813.58
\]

To get EBITD (earnings before interest, taxes, and depreciation), the numerator in the cash coverage ratio, add depreciation to EBIT:

\[
EBITD = EBIT + \text{Depreciation} = 26,813.58 + 2,485 = 29,298.58
\]

Now, simply plug the numbers into the cash coverage ratio and calculate:

\[
\text{Cash coverage ratio} = \frac{EBITD}{\text{Interest}} = \frac{29,298.58}{3,806} = 7.70 \text{ times}
\]

24. The only ratio given that includes cost of goods sold is the inventory turnover ratio, so it is the last ratio used. Since current liabilities is given, we start with the current ratio:

\[
\text{Current ratio} = 1.60 = \frac{CA}{CL} = \frac{CA}{435,000}
\]

\[
CA = 696,000
\]

Using the quick ratio, we solve for inventory:

\[
\text{Quick ratio} = 0.95 = \frac{(CA - \text{Inventory})}{CL} = \frac{(696,000 - \text{Inventory})}{435,000}
\]

\[
\text{Inventory} = CA - (\text{Quick ratio} \times CL)
\]

\[
\text{Inventory} = 696,000 - (0.95 \times 435,000)
\]

\[
\text{Inventory} = 282,750
\]

\[
\text{Inventory turnover} = 6.20 = \frac{\text{COGS}}{\text{Inventory}} = \frac{\text{COGS}}{282,750}
\]

\[
\text{COGS} = 1,753,050
\]

25. \( PM = \frac{\text{NI}}{\text{S}} = \frac{-£45,831}{£198,352} = -0.2311, \text{ or } -23.11\% \)

As long as both net income and sales are measured in the same currency, there is no problem; in fact, except for some market value ratios like EPS and BVPS, none of the financial ratios discussed in the text are measured in terms of currency. This is one reason why financial ratio analysis is widely used in international finance to compare the business operations of firms and/or divisions across national economic borders. The net income in dollars is:

\[
\text{NI} = PM \times \text{Sales}
\]

\[
\text{NI} = -0.2311(\$314,883) = \$72,757
\]

26. Short-term solvency ratios:

\[
\text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}}
\]

\[
\text{Current ratio 2011} = \frac{61,886}{46,755} = 1.32 \text{ times}
\]

\[
\text{Current ratio 2012} = \frac{66,645}{53,773} = 1.24 \text{ times}
\]
Quick ratio \[= \frac{\text{Current assets} - \text{Inventory}}{\text{Current liabilities}}\]
Quick ratio 2011 \[= \frac{\$61,886 - 25,392}{\$46,755} = 0.78 \text{ times}\]
Quick ratio 2012 \[= \frac{\$66,645 - 27,155}{\$53,773} = 0.73 \text{ times}\]

Cash ratio \[= \frac{\text{Cash}}{\text{Current liabilities}}\]
Cash ratio 2011 \[= \frac{\$24,046}{\$46,755} = 0.51 \text{ times}\]
Cash ratio 2012 \[= \frac{\$24,255}{\$53,773} = 0.45 \text{ times}\]

**Asset utilization ratios:**
Total asset turnover \[= \frac{\text{Sales}}{\text{Total assets}}\]
Total asset turnover \[= \frac{\$366,996}{\$432,379} = 0.85 \text{ times}\]

Inventory turnover \[= \frac{\text{Cost of goods sold}}{\text{Inventory}}\]
Inventory turnover \[= \frac{\$253,122}{\$27,155} = 9.32 \text{ times}\]

Receivables turnover \[= \frac{\text{Sales}}{\text{Accounts receivable}}\]
Receivables turnover \[= \frac{\$366,996}{\$15,235} = 24.09 \text{ times}\]

**Long-term solvency ratios:**
Total debt ratio \[= \frac{(\text{Total assets} - \text{Total equity})}{\text{Total assets}}\]
Total debt ratio 2011 \[= \frac{(\$386,581 - 259,826)}{\$386,581} = 0.33 \text{ times}\]
Total debt ratio 2012 \[= \frac{(\$432,379 - 283,606)}{\$432,379} = 0.34 \text{ times}\]

Debt-equity ratio \[= \frac{\text{Total debt}}{\text{Total equity}}\]
Debt-equity ratio 2011 \[= \frac{(\$46,755 + 80,000)}{\$259,826} = 0.49 \text{ times}\]
Debt-equity ratio 2012 \[= \frac{(\$53,773 + 95,000)}{\$283,606} = 0.52 \text{ times}\]

Equity multiplier \[= 1 + \text{D/E}\]
Equity multiplier 2011 \[= 1 + 0.49 = 1.49 \text{ times}\]
Equity multiplier 2012 \[= 1 + 0.52 = 1.52 \text{ times}\]

Times interest earned \[= \frac{\text{EBIT}}{\text{Interest}}\]
Times interest earned \[= \frac{\$81,654}{\$14,300} = 5.71 \text{ times}\]

Cash coverage ratio \[= \frac{(\text{EBIT} + \text{Depreciation})}{\text{Interest}}\]
Cash coverage ratio \[= \frac{(\$81,654 + 32,220)}{\$14,300} = 7.96 \text{ times}\]

**Profitability ratios:**
Profit margin \[= \frac{\text{Net income}}{\text{Sales}}\]
Profit margin \[= \frac{\$43,780}{\$366,996} = 0.1193, \text{ or } 11.93\%\]

Return on assets \[= \frac{\text{Net income}}{\text{Total assets}}\]
Return on assets \[= \frac{\$43,780}{\$432,379} = 0.1013, \text{ or } 10.13\%\]

Return on equity \[= \frac{\text{Net income}}{\text{Total equity}}\]
Return on equity \[= \frac{\$43,780}{\$283,606} = 0.1544, \text{ or } 15.44\%\]

27. The DuPont identity is:

\[
\text{ROE} = (\text{PM})(\text{TAT})(\text{EM})
\]
\[
\text{ROE} = (0.1193)(0.85)(1.52) = 0.1544, \text{ or } 15.44\%\]
### 28. SMOLIRA GOLF CORP.

**Statement of Cash Flows**

**For 2012**

<table>
<thead>
<tr>
<th>Cash, beginning of the year</th>
<th>$24,046</th>
</tr>
</thead>
</table>

**Operating activities**

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net income</td>
<td>$43,780</td>
</tr>
<tr>
<td>Plus:</td>
<td></td>
</tr>
<tr>
<td>Depreciation</td>
<td>$32,220</td>
</tr>
<tr>
<td>Increase in accounts payable</td>
<td>4,236</td>
</tr>
<tr>
<td>Increase in other current liabilities</td>
<td>3,982</td>
</tr>
<tr>
<td>Less:</td>
<td></td>
</tr>
<tr>
<td>Increase in accounts receivable</td>
<td>($2,787)</td>
</tr>
<tr>
<td>Increase in inventory</td>
<td>(1,763)</td>
</tr>
</tbody>
</table>

**Net cash from operating activities**

<table>
<thead>
<tr>
<th>$79,668</th>
</tr>
</thead>
</table>

**Investment activities**

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed asset acquisition</td>
<td>($73,259)</td>
</tr>
</tbody>
</table>

**Net cash from investment activities**

<table>
<thead>
<tr>
<th>$(73,259)</th>
</tr>
</thead>
</table>

**Financing activities**

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase in notes payable</td>
<td>($1,200)</td>
</tr>
<tr>
<td>Dividends paid</td>
<td>(20,000)</td>
</tr>
<tr>
<td>Increase in long-term debt</td>
<td>15,000</td>
</tr>
</tbody>
</table>

**Net cash from financing activities**

<table>
<thead>
<tr>
<th>$(6,200)</th>
</tr>
</thead>
</table>

**Net increase in cash**

<table>
<thead>
<tr>
<th>$209</th>
</tr>
</thead>
</table>

**Cash, end of year**

<table>
<thead>
<tr>
<th>$24,255</th>
</tr>
</thead>
</table>

### 29. Earnings per share

\[
\text{Earnings per share} = \frac{\text{Net income}}{\text{Shares}}
\]

\[
\text{Earnings per share} = \frac{43,780}{25,000} = 1.75 \text{ per share}
\]

\[
\text{P/E ratio} = \frac{\text{Shares price}}{\text{Earnings per share}}
\]

\[
\text{P/E ratio} = \frac{43}{1.75} = 24.55 \text{ times}
\]

\[
\text{Dividends per share} = \frac{\text{Dividends}}{\text{Shares}}
\]

\[
\text{Dividends per share} = \frac{20,000}{25,000} = 0.80 \text{ per share}
\]

\[
\text{Book value per share} = \frac{\text{Total equity}}{\text{Shares}}
\]

\[
\text{Book value per share} = \frac{283,606}{25,000} = 11.34 \text{ per share}
\]
Market-to-book ratio = Share price / Book value per share
Market-to-book ratio = $43 / $11.34 = 3.79 times

PEG ratio = P/E ratio / Growth rate
PEG ratio = 24.55 / 9 = 2.73 times

30. First, we will find the market value of the company’s equity, which is:

Market value of equity = Shares × Share price
Market value of equity = 25,000($43) = $1,075,000

The total book value of the company’s debt is:

Total debt = Current liabilities + Long-term debt
Total debt = $53,773 + 95,000 = $148,773

Now we can calculate Tobin’s Q, which is:

Tobin’s Q = (Market value of equity + Book value of debt) / Book value of assets
Tobin’s Q = ($1,075,000 + 148,773) / $432,379
Tobin’s Q = 2.83

Using the book value of debt implicitly assumes that the book value of debt is equal to the market value of debt. This will be discussed in more detail in later chapters, but this assumption is generally true. Using the book value of assets assumes that the assets can be replaced at the current value on the balance sheet. There are several reasons this assumption could be flawed. First, inflation during the life of the assets can cause the book value of the assets to understate the market value of the assets. Since assets are recorded at cost when purchased, inflation means that it is more expensive to replace the assets. Second, improvements in technology could mean that the assets could be replaced with more productive, and possibly cheaper, assets. If this is true, the book value can overstate the market value of the assets. Finally, the book value of assets may not accurately represent the market value of the assets because of depreciation. Depreciation is done according to some schedule, generally straight-line or MACRS. Thus, the book value and market value can often diverge.