Answers to Concepts Review and Critical Thinking Questions

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

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.

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 DuPont 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.

Solutions to Questions and Problems

7. \[ \text{ROE} = (\text{PM})(\text{TAT})(\text{EM}) \]
   \[ \text{ROE} = (.061)(2.10)(1.15) \]
   \[ \text{ROE} = .1473, \text{ or } 14.73\% \]
12. The equity multiplier is:

\[ EM = 1 + \frac{D}{E} \]
\[ EM = 1 + .65 \]
\[ EM = 1.65 \]

One formula to calculate return on equity is:

\[ ROE = \text{ROA}(EM) \]
\[ ROE = .082(1.65) \]
\[ ROE = .1353, \text{ or } 13.53\% \]

ROE can also be calculated as:

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

So, net income is:

\[ \text{Net income} = \text{ROE}(TE) \]
\[ \text{Net income} = .1353(515,000) \]
\[ \text{Net income} = 69,679.50 \]

The common-size, common-base year answers for Question 15 are found by dividing the common-size percentage for 2015 by the common-size percentage for 2014. For example, the cash calculation is found by:

\[ \frac{2.93\%}{2.67\%} = 1.0963 \]

This tells us that cash, as a percentage of assets, increased by 9.63%.

17.  
   a. Current ratio \[ = \frac{\text{Current assets}}{\text{Current liabilities}} \]
   \[ \text{Current ratio 2014} = \frac{90,717}{62,939} = 1.44 \text{ times} \]
   \[ \text{Current ratio 2015} = \frac{100,617}{66,442} = 1.51 \text{ times} \]

   b. Quick ratio \[ = \frac{(\text{Current assets} - \text{Inventory})}{\text{Current liabilities}} \]
   \[ \text{Quick ratio 2014} = \frac{(90,717 - 51,163)}{62,939} = .63 \text{ times} \]
   \[ \text{Quick ratio 2015} = \frac{(100,617 - 56,295)}{66,442} = .67 \text{ times} \]

   c. Cash ratio \[ = \frac{\text{Cash}}{\text{Current liabilities}} \]
   \[ \text{Cash ratio 2014} = \frac{11,135}{62,939} = .18 \text{ times} \]
   \[ \text{Cash ratio 2015} = \frac{13,407}{66,442} = .20 \text{ times} \]

   d. NWC ratio \[ = \frac{\text{NWC}}{\text{Total assets}} \]
   \[ \text{NWC ratio 2014} = \frac{(90,717 - 62,939)}{417,173} = .0666, \text{ or } 6.66\% \]
   \[ \text{NWC ratio 2015} = \frac{(100,617 - 66,442)}{458,177} = .0746, \text{ or } 7.46\% \]

   e. Debt-equity ratio \[ = \frac{\text{Total debt}}{\text{Total equity}} \]
   \[ \text{Debt-equity ratio 2014} = \frac{(62,939 + 44,000)}{310,234} = .34 \text{ times} \]
   \[ \text{Debt-equity ratio 2015} = \frac{(66,442 + 39,000)}{352,735} = .30 \text{ times} \]
Equity multiplier \(= 1 + \frac{D}{E}\)
Equity multiplier 2014 \(= 1 + .34 = 1.34\)
Equity multiplier 2015 \(= 1 + .30 = 1.30\)

\[f.\] Total debt ratio \(= \frac{(\text{Total assets} – \text{Total equity})}{\text{Total assets}}\)
Total debt ratio 2014 \(= \frac{($417,173 – 310,234)}{$417,173} = .26 \text{ times}\)
Total debt ratio 2015 \(= \frac{($458,177 – 352,735)}{$458,177} = .23 \text{ times}\)

Long-term debt ratio \(= \frac{\text{Long-term debt}}{(\text{Long-term debt} + \text{Total equity})}\)
Long-term debt ratio 2014 \(= \frac{$44,000}{($44,000 + 310,234)} = .12 \text{ times}\)
Long-term debt ratio 2015 \(= \frac{$39,000}{($39,000 + 352,735)} = .10 \text{ times}\)

22. The solution requires substituting two ratios into a third ratio. Rearranging Debt / Total assets:

Firm A
\[
\begin{align*}
D / TA &= .55 \\
(TA – E) / TA &= .55 \\
(TA / TA) – (E / TA) &= .55 \\
1 – (E / TA) &= .55 \\
E / TA &= .45 \\
E &= .45(TA)
\end{align*}
\]

Firm B
\[
\begin{align*}
D / TA &= .40 \\
(TA – E) / TA &= .40 \\
(TA / TA) – (E / TA) &= .40 \\
1 – (E / TA) &= .40 \\
E / TA &= .60 \\
E &= .60(TA)
\end{align*}
\]

Rearranging \(\text{ROA} = \frac{\text{Net income}}{\text{Total assets}}\), we find:

\[
\begin{align*}
\text{NI} / TA &= .08 \\
\text{NI} &= .08(TA)
\end{align*}
\]

\[
\begin{align*}
\text{NI} / TA &= .11 \\
\text{NI} &= .11(TA)
\end{align*}
\]

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

\[
\begin{align*}
\text{ROE} &= \frac{.08(TA)}{.45(TA)} \\
\text{ROE} &= .11(TA) / .60 (TA) \\
\text{ROE} &= .08 / .45 \\
\text{ROE} &= .11 / .60 \\
\text{ROE} &= .1778, \text{ or } 17.78\% \\
\text{ROE} &= .1833, \text{ or } 18.33\%
\end{align*}
\]

26. \textit{Short-term solvency ratios:}

\[
\begin{align*}
\text{Current ratio} &= \frac{\text{Current assets}}{\text{Current liabilities}} \\
\text{Current ratio 2014} &= \frac{$68,074}{$61,722} = 1.10 \text{ times} \\
\text{Current ratio 2015} &= \frac{$79,974}{$69,426} = 1.15 \text{ times}
\end{align*}
\]

\[
\begin{align*}
\text{Quick ratio} &= \frac{(\text{Current assets} – \text{Inventory})}{\text{Current liabilities}} \\
\text{Quick ratio 2014} &= \frac{($68,074 – 27,931)}{$61,722} = .65 \text{ times} \\
\text{Quick ratio 2015} &= \frac{($79,974 – 32,586)}{$69,426} = .68 \text{ times}
\end{align*}
\]

\[
\begin{align*}
\text{Cash ratio} &= \frac{\text{Cash}}{\text{Current liabilities}} \\
\text{Cash ratio 2014} &= \frac{$26,450}{$61,722} = .43 \text{ times} \\
\text{Cash ratio 2015} &= \frac{$29,106}{$69,426} = .42 \text{ times}
\end{align*}
\]

\textit{Asset utilization ratios:}

\[
\begin{align*}
\text{Total asset turnover} &= \frac{\text{Sales}}{\text{Total assets}} \\
\text{Total asset turnover} &= \frac{$422,045}{$478,319} = .88 \text{ times}
\end{align*}
\]
Inventory turnover = Cost of goods sold / Inventory 
Inventory turnover = $291,090 / $32,586 = 8.93 times

Receivables turnover = Sales / Accounts receivable
Receivables turnover = $422,045 / $18,282 = 23.09 times

*Long-term solvency ratios:*
Total debt ratio = (Total assets – Total equity) / Total assets
Total debt ratio 2014 = ($425,239 – 268,517) / $425,239 = .37 times
Total debt ratio 2015 = ($478,319 – 298,893) / $478,319 = .38 times

Debt-equity ratio = Total debt / Total equity
Debt-equity ratio 2014 = ($61,722 + 95,000) / $268,517 = .58 times
Debt-equity ratio 2015 = ($69,426 + 110,000) / $298,893 = .60 times

Equity multiplier = 1 + D/E
Equity multiplier 2014 = 1 + .58 = 1.58 times
Equity multiplier 2015 = 1 + .60 = 1.60 times

Times interest earned = EBIT / Interest
Times interest earned = $93,902 / $16,400 = 5.73 times

Cash coverage ratio = (EBIT + Depreciation) / Interest
Cash coverage ratio = ($93,902 + 37,053) / $16,400 = 7.99 times

*Profitability ratios:*
Profit margin = Net income / Sales
Profit margin = $50,376 / $422,045 = .1194, or 11.94%

Return on assets = Net income / Total assets
Return on assets = $50,376 / $478,319 = .1053, or 10.53%

Return on equity = Net income / Total equity
Return on equity = $50,376 / $298,893 = .1685, or 16.85%

27. The DuPont identity is:

\[
\text{ROE} = (\text{PM})(\text{TAT})(\text{EM})
\]

\[
\text{ROE} = (.1194)(.88)(1.60) = .1685, \text{ or } 16.85\%
\]