

## Chapter 2 Solutions

- 2-1 Publically-traded companies are required to provide adequate financial information to their shareholders. Information generally is provided through financial reports that a company periodically produces, which include a balance sheet, an income statement, a statement of cash flows, and a statement of retained earnings. In addition, the reports published by a company contain discussions of the firm's operations, both present and forecasted.
- 2-2 (a) The balance sheet shows, at a particular point in time, the amount the firm has invested in assets and how much of those investments are financed with loans (liabilities) and how much are financed with equity (stock). (b) The income statement shows the revenues (sales) that the firm generated during a particular period and the expenses that were incurred during that same period, whether those expense were incurred as the result of normal operations or as the result of how the firm is financed. (c) The statement of cash flows shows how the firm generated cash (inflows) and how the firm used cash (outflows) during a particular accounting period. If the firm uses more cash than it generates through normal operations, it is deficit spending, and deficit spending must be financed with external funds (either stocks or bonds).
- 2-3 The most important aspect of ratio analysis is the judgment used when interpreting the results to reach conclusions concerning a firm's current financial position and the direction in which the firm is headed in the future. The analyst should be aware of, and include in the interpretation, the fact that: (1) large firms with many different divisions are difficult to categorize in a single industry; (2) financial statements are reported at historical costs; (3) seasonal factors can distort the ratios; (4) some firms try to "window dress" their financial statements to look good; (5) firms use different accounting procedures to compute inventory values, depreciation, and so on; (6) there might not exist a single value that can be used for comparing firms' ratios (e.g., a current ratio of 2.0 might not be good); and (7) conclusions concerning the overall financial position of a firm should be based on a representative number of ratios, not a single ratio.
- 2-4 Shares issued = 100,000                      Price per share = \$7                      Par value per share = \$3
- Common stock at par = \$300,000 = \$3 x 100,000
- Paid-in capital = \$400,000                      = (\$7 - \$3) x 100,000 = \$700,000 - \$300,000
- 2-5 Net cash flow = Net income + Depreciation = \$90,000 + \$25,000 = \$115,000
- 2-6 The income statement for HighTech Wireless with the information that is given in the problem:

Sales	?	
Operating expenses, excluding depreciation	\$(500,000)	
Depreciation	<u>(100,000)</u>	
EBIT	?	
Interest	<u>0</u>	(HighTech has no debt)
Earnings before taxes (EBT)	?	
Taxes (40%)	<u>?</u>	
Net income (NI)	<u>\$240,000</u>	

Starting with net income and working up the income statement to solve for sales, we have the following computations:

$$1. \text{ NI} = \text{EBT}(1 - 0.4)$$

$$\text{Thus, EBT} = \frac{\text{Net income}}{1 - \text{Tax rate}} = \frac{\$240,000}{1 - 0.40} = \$400,000$$

$$\text{Taxes} = \$400,000 - \$240,000 = \$160,000$$

$$2. \text{ EBIT} = \text{EBT} + \text{Interest} = \$400,000 + 0 = \$400,000$$

$$3. \text{ Sales} = \text{EBIT} + \text{Operating expenses, excluding depreciation} + \text{Depreciation} \\ = \$400,000 + \$500,000 + \$100,000 = \$1,000,000$$

To show that this is the correct result, let's start with sales equal to \$1,000,000 and compute the net income:

Sales	\$1,000,000
Operating expenses, excluding depreciation	(500,000)
Depreciation	<u>(100,000)</u>
EBIT	400,000
Interest	<u>0</u>
Earnings before taxes (EBT)	400,000
Taxes (40%)	<u>(160,000)</u>
Net income	<u>\$240,000</u>

$$\text{Net cash flow} = \text{Net income} + \text{Depreciation} = \$240,000 + \$100,000 = \$340,000$$

$$2-7 \quad a. \quad \text{Current ratio} = 3.5 = \frac{\text{Current assets}}{\text{Current liabilities}} = \frac{\$73,500}{\text{Current liabilities}}$$

$$\text{Current liabilities} = \frac{\$73,500}{3.5} = \$21,000$$

$$b. \quad \text{Quick ratio} = 3.0 = \frac{\text{Current assets} - \text{Inventory}}{\text{Current liabilities}} = \frac{\$73,500 - \text{Inventory}}{\$21,000}$$

$$\text{Inventory} = \$73,500 - 3.0(\$21,000) = \$10,500$$

$$2-8 \quad a. \quad \text{Total assets turnover} = \frac{\text{Sales}}{\text{Total assets}} = \frac{\text{Sales}}{\$150,000} = 2.0$$

$$\text{Sales} = 2.0(\$150,000) = \$300,000$$

$$b. \quad \text{Return on assets} = \frac{\text{Net income}}{\text{Total assets}} = \frac{\text{Net income}}{\$150,000} = 0.06$$

$$\text{Net income} = 0.06(\$150,000) = \$9,000$$

$$\text{Net profit margin} = \frac{\text{Net income}}{\text{Sales}} = \frac{\$9,000}{\$300,000} = 0.03 = 3.0\%$$

$$2-9 \quad a. \quad ROA = \frac{\text{Net income}}{\text{Total assets}} = \frac{\text{Net income}}{\$300,000} = 0.05$$

$$\text{Net income} = 0.05(\$300,000) = \$15,000$$

$$b. \quad \text{Return on equity} = \frac{\text{Net income}}{\text{Common equity}} = \frac{\$15,000}{\$300,000 - \$200,000} = 0.15 = 15.0\%$$

Alternative solution:

$$\begin{aligned} \text{Return on equity} &= \frac{\text{Net income}}{\text{Common equity}} = ROA \times \frac{\text{Total assets}}{\text{Common equity}} \\ &= 0.05 \times \frac{\$300,000}{\$300,000 - \$200,000} = 0.05 \times 3.0 = 0.15 = 15.0\% \end{aligned}$$

$$2-10 \quad a. \quad \text{Debt ratio} = 40\%$$

$$\begin{aligned} \text{Proportion of firm} \\ \text{financed with common stock} &= 1 - 0.40 = 0.6 = 60\% = \frac{\text{Common equity}}{\text{Total assets}} = \frac{\text{Common equity}}{\$750,000} \end{aligned}$$

$$\text{Common equity} = \$750,000(0.6) = \$450,000$$

$$\begin{aligned} b. \quad ROA &= \frac{\text{Net income}}{\text{Total assets}} = \frac{\text{Sales}}{\text{Total assets}} \times \frac{\text{Net income}}{\text{Sales}} \\ 0.06 &= 3.0 \times \frac{\text{Net income}}{\text{Sales}} \end{aligned}$$

$$\frac{\text{Net income}}{\text{Sales}} = \frac{0.06}{3.0} = 0.02 = 2.0\% = \text{Net profit margin}$$

Alternative solution:

$$\begin{aligned} \text{Total assets} \\ \text{turnover} &= \frac{\text{Sales}}{\text{Total assets}} = \frac{\text{Sales}}{\$750,000} = 3.0 \end{aligned}$$

$$\text{Sales} = 3(\$750,000) = \$2,250,000$$

$$ROA = \frac{\text{Net income}}{\text{Total assets}} = \frac{\text{Net income}}{\$750,000} = 0.06$$

$$\text{Net income} = 0.06(\$750,000) = \$45,000$$

$$\begin{aligned} \text{Net profit} \\ \text{margin} &= \frac{\text{Net income}}{\text{Sales}} = \frac{\$45,000}{\$2,250,000} = 0.02 = 2.0\% \end{aligned}$$

$$2-11 \quad a. \quad \text{Total assets turnover} = \frac{\text{Sales}}{\text{Total assets}} = \frac{\text{Sales}}{\$10,000} = 2.5$$

$$\text{Sales} = 2.5(\$10,000) = \$25,000$$

$$\text{b. Return on assets} = \frac{\text{Net income}}{\text{Total assets}} = \frac{\text{Net income}}{\$10,000} = 0.04$$

$$\text{Net income} = 0.04(\$10,000) = \$400$$

$$\text{Net profit margin} = \frac{\text{Net income}}{\text{Sales}} = \frac{\$400}{\$25,000} = 0.016 = 1.6\%$$

Alternative solution:

$$\begin{aligned} \text{Return on assets} &= \frac{\text{Sales}}{\text{Total assets}} \times \frac{\text{Net income}}{\text{Sales}} \\ &= 2.5 \times \frac{\text{Net income}}{\text{Sales}} = 0.04 \end{aligned}$$

$$\frac{\text{Net income}}{\text{Sales}} = \frac{0.04}{2.5} = 0.016 = 1.6\% = \text{Net profit margin}$$

$$2-12 \quad (1) \quad \text{Current ratio: } \frac{\text{Current assets}}{\text{Current liabilities}} = 5.0 \times = \frac{\$340,000}{\text{Current liabilities}}$$

$$\text{Current liabilities} = \$340,000 / 5.0 = \$68,000$$

$$(2) \quad \text{Quick ratio: } \frac{\text{Current assets} - \text{Inventories}}{\text{Current liabilities}} = 1.8 \times = \frac{\$340,000 - \text{Inventories}}{\$68,000}$$

$$\text{Inventories} = \$340,000 - 1.8(\$68,000) = \$217,600$$

$$(3) \quad \text{Current assets} = (\text{Cash \& Equivalents}) + \text{Accounts receivable} + \text{Inventories}$$

$$\$340,000 = \$43,000 + \text{Accounts receivable} + \$217,600$$

$$\text{Accounts receivable} = \$340,000 - \$43,000 - \$217,600 = \$79,400$$

$$(4) \quad \text{Inventory turnover: } \frac{\text{Cost of goods sold}}{\text{Inventory}} = 7.0 \times = \frac{\text{CGS}}{\$217,600}$$

$$\text{CGS} = 7(\$217,600) = \$1,523,200$$

$$(5) \quad \text{CGS} = 0.80 (\text{Sales}), \text{ thus: } \text{Sales} = \frac{\$1,523,200}{0.80} = \$1,904,000$$

$$(6) \quad \text{DSO} = \frac{\text{Accounts receivable}}{\text{Sales} / 360} = \frac{\$79,400}{(\$1,904,000 / 360)} = 15 \text{ days}$$

$$2-13 \quad \text{a. TIE} = \text{EBIT} / \text{INT}, \text{ so find EBIT and INT}$$

$$\text{Interest} = \$200,000 \times 0.06 = \$12,000$$

$$\text{Net income} = \$540,000 \times 0.04 = \$21,600$$

$$\text{Taxable income (EBT)} = \$21,600 / (1 - T) = \$21,600 / (1 - 0.4) = \$36,000$$

$$\text{EBIT} = \$36,000 + \$12,000 = \$48,000$$

$$\text{TIE} = \$48,000 / \$12,000 = 4.0 \times$$

b. For TIE to equal 6.0,  $\text{EBIT} = 6.0(\$12,000) = \$72,000$

$$\text{When EBIT} = \$72,000, \text{Net income} = (\$72,000 - \$12,000)(1 - 0.40) = \$36,000$$

$$\text{Because NI} = 0.04(\text{Sales}), \text{Sales} = \$36,000 / 0.04 = \$900,000$$

Check: When Sales = \$900,000,  $\text{NI} = \$900,000 \times 0.04 = \$36,000$

$$\text{EBT} = \$36,000 / (1 - 0.40) = \$60,000$$

$$\text{EBIT} = \$60,000 + \$12,000 = \$72,000$$

$$\text{TIE} = \$72,000 / \$12,000 = 6.0$$

2-14 We are given: Common equity = \$35,000,000      Common shares outstanding = 7,000,000

Market price per share = \$8      Net income = \$14,000,000

a.  $\text{EPS} = \$14,000,000 / 7,000,000 = \$2$

$$\text{P/E ratio} = \$8 / \$2 = 4.0$$

b.  $\text{Book value per share} = \$35,000,000 / 7,000,000 = \$5$

$$\text{M/B ratio} = \$8 / \$5 = 1.6$$

2-15 We are given: ROE = 15%      TA turnover = Sales/Total assets = 2.0x

Debt Ratio = 60%

a. From DuPont equation:  $\text{ROE} = \text{ROA} \times \text{Equity multiplier}$

$$0.15 = \text{ROA} \times (\text{Total assets/Common equity})$$

Recognize that Total assets/Common equity is simply the inverse of the proportion of the firm that is financed with equity. The proportion of the firm that is financed with equity equals  $1 - \text{Debt ratio}$ . Thus,

$$0.15 = \text{ROA} \times \left( \frac{1}{1 - \text{Debt ratio}} \right)$$

$$0.15 = \text{ROA} \times \left( \frac{1}{1 - 0.6} \right)$$

$$\text{ROA} = 0.15 / 2.5 = 0.06 = 6.0\%$$

b.  $ROA = (\text{Net profit margin}) \times (\text{Total assets turnover})$

$$0.06 = \text{Net profit margin} \times 2.0$$

$$\text{Net profit margin} = 0.06/2.0 = 0.03 = 3.0\%$$

Alternative solution:

$$\text{TA turnover} = \text{Sales}/\text{Total assets} = 2.0x, \text{ thus } \text{Sales} = 2.0(\text{Total assets})$$

$$ROE = (\text{Net income})/(\text{Common equity}) = (\text{Net income})/[(1 - 0.6)(\text{Total assets})] = 0.15, \text{ thus,}$$

$$\text{Net income} = 0.15(0.4)(\text{Total assets}) = 0.06(\text{Total assets})$$

$$PM = \frac{\text{Net income}}{\text{Sales}} = \frac{0.06(\text{Total assets})}{2.0(\text{Total assets})} = \frac{0.06}{2.0} = 0.03 = 3.0\%$$

2-16 We are given:  $ROA = 8\%$   $\text{Total assets} = \$440,000$

$$\text{Debt Ratio} = 20\%$$

a.  $ROA = \frac{\text{Net income}}{\text{Total assets}}$   $0.08 = \frac{\text{Net income}}{\$440,000}$

$$\text{Net income} = 0.08(\$440,000) = \$35,200$$

b. From DuPont equation:  $ROE = ROA \times \text{Equity multiplier}$

$$\text{Equity multiplier} = \frac{\text{Total assets}}{\text{Common equity}} = \frac{1}{1 - \text{Debt ratio}} = \frac{1}{1 - 0.20} = 1.25$$

$$\text{Thus, } ROE = 0.08 \times 1.25 = 0.10 = 10.0\%$$

Alternative solution:

$$\text{Common equity} = \$440,000(1 - 0.2) = \$352,000$$

$$ROE = \frac{\text{Net income}}{\text{Common equity}} = \frac{\$35,200}{\$352,000} = 0.10 = 10.0\%$$

2-17 We are given:  $ROA = 4\%$   $\text{Current assets} = \$260,000$

$$\text{Net income} = \$140,000 \quad \text{Long-term debt} = \$1,755,000$$

$$\% \text{ assets financed with equity} = 35\%$$

$$(1) ROA = \frac{\text{Net income}}{\text{Total assets}} = \frac{\$140,000}{\text{Total assets}} = 0.04; \text{ Total assets} = \$140,000/0.04 = \$3,500,000$$

$$(2) \text{ Total liabilities} = (\text{Total assets})(\text{Debt ratio}) = \$3,500,000(1 - 0.35) = \$2,275,000$$

$$(3) \text{ Current liabilities} = \text{Total liabilities} - \text{Long-term debt} = \$2,275,000 - \$1,755,000 = \$520,000$$

$$(4) \text{ Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}} = \frac{\$260,000}{\$520,000} = 0.5$$

2-18 We are given: ROA = 3%                      ROE = 5%                      Total assets = \$100,000

$$a. \text{ ROA} = \frac{\text{Net income}}{\text{Total assets}} = \frac{\text{Net income}}{\$100,000} = 0.03 ; \text{ Net income} = \$100,000(0.03) = \$3,000$$

$$b. \text{ ROE} = \frac{\text{Net income}}{\text{Common equity}} = \frac{\$3,000}{\text{Common equity}} = 0.05 ; \text{ CE} = \$3,000/0.05 = \$60,000$$

$$\text{Debt ratio} = \frac{\text{Total liabilities}}{\text{Total assets}} = \frac{\$100,000 - \$60,000}{\$100,000} = 0.40 = 40\%$$

2-19 We are given: % assets financed with equity = 60%                      Current ratio = 5.0

   Total assets turnover = 4.0                      Current assets = \$150,000

   Sales = \$1,800,000

$$(1) \text{ Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}} = \frac{\$150,000}{\text{Current liabilities}} = 5.0$$

$$\text{Current liabilities} = \$150,000/5 = \$30,000$$

$$(2) \text{ Total assets turnover} = \frac{\text{Sales}}{\text{Total assets}} = \frac{\$1,800,000}{\text{Total assets}} = 4.0$$

$$\text{Total assets} = \$1,800,000/4.0 = \$450,000$$

$$(3) \text{ Total liabilities} = \$450,000(1 - 0.60) = \$180,000$$

$$(4) \text{ Long-term liabilities} = \$180,000 - \$30,000 = \$150,000$$

2-20 We are given: P/E ratio = 15.0                      Price per share = \$30

   Fixed assets turnover = 8.0                      Current ratio = 5.0

   Current liabilities = \$300,000                      Net profit margin = 0.04

   Shares of common = 60,000

$$(1) \text{ P/E ratio} = \frac{\text{Price per share}}{\text{EPS}} = \frac{\$30}{\text{EPS}} = 15.0 ; \text{ EPS} = \$30/15 = \$2$$

$$\text{Net income} = 60,000(\$2) = \$120,000$$

$$(2) \text{ Net profit margin} = \frac{\text{Net income}}{\text{Sales}} = \frac{\$120,000}{\text{Sales}} = 0.04 ; \text{ Sales} = \$120,000/0.04 = \$3,000,000$$

$$(3) \text{ Fixed assets turnover} = \frac{\text{Sales}}{\text{Net fixed assets}} = \frac{\$3,000,000}{\text{Fixed assets}} = 8.0 ; \text{ Fixed assets} = \$3,000,000/8 = \$375,000$$

$$(4) \quad \text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}} = \frac{\text{CA}}{\$300,000} = 5.0 ; \text{Current assets} = \$300,000(5) = \$1,500,000$$

$$(5) \text{ Total assets} = \text{Fixed assets} + \text{Current assets} = \$375,000 + \$1,500,000 = \$1,875,000$$

$$a. \quad \text{ROA} = \frac{\text{Net income}}{\text{Total assets}} = \frac{\$120,000}{\$1,875,000} = 0.064 = 6.4\%$$

$$b. \quad \text{Total assets turnover} = \frac{\text{Sales}}{\text{Total assets}} = \frac{\$3,000,000}{\$1,875,000} = 1.6$$