

CHAPTER 3 – ANALYZING FINANCIAL STATEMENTS

Questions

- LG3-1 through LG3-5
1. Classify each of the following ratios according to a ratio category (liquidity ratio, asset management ratio, debt management ratio, profitability ratio, or market value ratio).
- Current ratio – liquidity ratio
 - Inventory turnover – asset management ratio
 - Return on assets – profitability ratio
 - Average payment period – asset management ratio
 - Times interest earned – debt management ratio
 - Capital intensity – asset management ratio
 - Equity multiplier – debt management ratio
 - Basic earnings power – profitability ratio
- LG3-1
2. For each of the following actions, determine what would happen to the current ratio. Assume nothing else on the balance sheet changes and that net working capital is positive.
- Accounts receivable are paid in cash – Current ratio does not change
 - Notes payable are paid off with cash – Current ratio increases
 - Inventory is sold on account – Current ratio does not change
 - Inventory is purchased on account – Current ratio decreases
 - Accrued wages and taxes increase – Current ratio decreases
 - Long-term debt is paid with cash – Current ratio decreases
 - Cash from a short-term bank loan is received – Current ratio decreases
- LG3-1 through LG3-5
3. Explain the meaning and significance of the following ratios
- Quick ratio - Inventories are generally the least liquid of a firm's current assets. Further, inventory is the current asset for which book values are the least reliable measures of market value. In practical terms, what this means is that if the firm must sell inventory to pay upcoming bills, the firm is most likely to have to discount inventory items in order to liquidate them, and therefore, they are the current assets on which losses are most likely to occur. Therefore, the quick (or acid-test) ratio measures a firm's ability to pay off short-term obligations without relying on inventory sales. The quick ratio measures the dollars of more liquid assets (cash and marketable securities and accounts receivable) available to pay each dollar of current liabilities.
 - Average collection period - The average collection period (ACP) measures the number of days accounts receivable are held before the firm collects cash from the sale. In general, a firm wants to produce a high level of sales per dollar of accounts receivable; that is, it wants to collect its accounts receivable as quickly as possible to reduce any cost of financing inventories and accounts receivable, including interest expense on liabilities used to finance inventories and accounts receivable, and defaults associated with accounts receivable.

c. Return on equity - Return on equity (ROE) measures the return on the common stockholders' investment in the assets of the firm. ROE is the net income earned per dollar of common stockholders' equity. The value of a firm's ROE is affected not only by net income, but also by the amount of financial leverage or debt that firm uses.

d. Days' sales in inventory - The days' sales in inventory ratio measures the number of days that inventory is held before the final product is sold. In general, a firm wants to produce a high level of sales per dollar of inventory; that is, it wants to turn inventory over (from raw materials to finished goods to sold goods) as quickly as possible. A high level of sales per dollar of inventory implies reduced warehousing, monitoring, insurance, and any other costs of servicing the inventory. So, a high inventory turnover ratio or a low days' sales in inventory is a sign of good management.

e. Debt ratio - The debt ratio measures the percentage of total assets financed with debt. The debt-to-equity ratio measures the dollars of debt financing used for every dollar of equity financing. The equity multiplier measures the dollars of assets on the balance sheet for every dollar of equity financing. As you might suspect, all three measures are related. So, the lower the debt, debt-to-equity, or equity multiplier ratios, the less debt and more equity the firm uses to finance its assets (i.e., the bigger the firm's equity cushion).

f. Profit margin - The profit margin is the percentage of sales left after all firm expenses are paid.

g. Accounts payable turnover - The accounts payable turnover measures the dollar cost of goods sold per dollar of accounts payable. In general, a firm wants to pay for its purchases as slowly as possible. The slower the firm pays for its supply purchases, the longer it can avoid obtaining other costly sources of financing such as notes payable or long-term debt. Thus, a high APP or a low accounts payable turnover is generally a sign of good management.

h. Market-to-book ratio - The market-to-book ratio compares the market (current) value of the firm's equity to its historical cost. In general, the higher the market-to-book ratio, the better the firm.

LG3-2 4. A firm has an average collection period of 10 days. The industry average ACP is 25 days. Is this a good or poor sign about the management of the firm's accounts receivable?

If the ACP is extremely low, the firm's accounts receivable policy may be so strict that customers prefer to do business with competing firms. Firms offer accounts receivable terms as an incentive to get customers to buy products from their firm rather than a competing firm. By offering customers the accounts receivable privilege, management allows them to buy (more) now and pay later. Without this incentive, customers may choose to buy the goods from the firm's competitors who offer better credit terms. So, extremely low ACP levels may be a sign of bad firm management.

LG3-3 5. A firm has a debt ratio of 20 percent. The industry average debt ratio is 65 percent. Is this a good or poor sign about the management of the firm's financial leverage?

When a firm issues debt to finance its assets, it gives the debt holders first claim to a fixed amount of its cash flows. Stockholders are entitled to any residual cash flows—those left after debt holders are paid. When a firm does well, financial leverage increases the reward to

shareholders since the amount of cash flows promised to debt holders is constant and capped. So, when firms do well, financial leverage creates more cash flows to share with stockholders—it magnifies the return to the stockholders of the firm. This magnification is one reason that firm stockholders encourage the use of debt financing. However, financial leverage also increases the firm's potential for financial distress and even failure. If the firm has a bad year and cannot make promised debt payments, debtholders can force the firm into bankruptcy. Thus, a firm's current and potential debtholders (and even stockholders) look at equity financing as a safety cushion that can absorb fluctuations in the firm's earnings and asset values and guarantee debt service payments. Clearly, the larger the fluctuations or variability of a firm's cash flows, the greater the need for an equity cushion. Managers' choice of capital structure—the amount of debt versus equity to issue—affects the firm's viability as a long-term entity. In deciding the level of debt versus equity financing to hold on the balance sheet, managers must consider the trade-off between maximizing cash flows to the firm's stockholders versus the risk of being unable to make promised debt payments. In summary, the low debt ratio could be either a good sign or a poor sign, depending upon the overall circumstances.

- LG3-4 6. A firm has an ROE of 20 percent. The industry average ROE is 12 percent. Is this a good or poor sign about the management of the firm?

Generally, a high ROE is considered to be a positive sign of firm performance. However, if performance comes from a high degree of financial leverage, a high ROE can indicate a firm with an unacceptably high level of bankruptcy risk as well.

- LG3-6 7. Why is the DuPont system of analysis an important tool when evaluating firm performance?

Many of the ratios discussed in the chapter are interrelated. So, a change in one ratio may well affect the value of several ratios. Often these interrelations can help evaluate firm performance. Managers and investors often perform a detailed analysis of ROA (return on assets) and ROE (return on equity) using the DuPont analysis system. Popularized by the DuPont Corporation, the DuPont analysis system uses the balance sheet and income statement to break the ROA and ROE ratios into component pieces.

- LG3-6 8. A firm has an ROE of 10 percent. The industry average ROE is 15 percent. How can the DuPont system of analysis help the firm's managers identify the reasons for this difference?

The basic DuPont equation looks at the firm's overall profitability as a function of the profit the firm earns per dollar of sales (operating efficiency) and the dollar of sales produced per dollar of assets on the balance sheet (efficiency in asset use). With this tool, managers can see the reason for any changes in ROA in more detail. For example, if ROA increases, the DuPont equation may show that the net profit margin was constant, but the total asset turnover (efficiency in using assets) increased, or that total asset turnover remained constant, but profit margins (operating efficiency) increased. Managers can more specifically identify the reasons for an ROA change by using the ratios described in the chapter to further break down operating efficiency and efficiency in asset use.

- LG3-6 9. What is the difference between the internal growth rate and the sustainable growth rate?

The internal growth rate is the growth rate a firm can sustain if it uses only internal financing—that is, retained earnings—to finance future growth. A problem arises when a firm relies only on internal financing to support asset growth. Through time, its debt ratio will fall because as asset values grow, total debt stays constant—only retained earnings finance asset growth. If total debt remains constant as assets grow, the debt ratio decreases. Shareholders often become disgruntled if, as the firm grows, a decreasing debt ratio (increasing equity financing) dilutes their return. So as firms grow, managers must often try to maintain a debt ratio that they view as optimal. In this case, managers finance asset growth with new debt *and* retained earnings. The maximum growth rate that can be achieved this way is the sustainable growth rate.

LG3-7 10. What is the difference between time series analysis and cross-sectional analysis?

Time series analysis evaluates the performance of the firm over time. Cross-sectional analysis evaluates the performance of the firm against one or more companies in the same industry.

LG3-7 11. What information do time series and cross-sectional analysis provide for firm managers, analysts, and investors?

Analyzing ratio trends over time, along with absolute ratio levels, gives managers, analysts, and investors information about whether a firm's financial condition is improving or deteriorating. For example, ratio analysis may reveal that the days' sales in inventory is increasing. This suggests that inventories, relative to the sales they support, are not being used as well as they were in the past. If this increase is the result of a deliberate policy to increase inventories to offer customers a wider choice and if it results in higher future sales volumes or increased margins that more than compensate for increased capital tied up in inventory, the increased relative size of the inventories is good for the firm. Managers and investors should be concerned, on the other hand, if increased inventories result from declining sales but steady purchases of supplies and production.

Looking at one firm's financial ratios, even through time, give managers, analysts, and investors only a limited picture of firm performance. Ratio analysis almost always includes a comparison of one firm's ratios relative to the ratios of other firms in the industry, or cross-sectional analysis. Key to cross-sectional analysis is identifying similar firms in that they compete in the same markets, have similar assets sizes, and operate in a similar manner to the firm being analyzed. Since no two firms are identical, obtaining such a comparison group is no easy task. Thus, the choice of companies to use in cross-sectional analysis is at best subjective.

LG3-8 12. Why is it important to know a firm's accounting rules before making any conclusions about its performance from ratios analysis?

Firms use different accounting procedures. For example, inventory methods can vary. One firm may use FIFO (first-in, first-out), transferring inventory at the first purchase price, while another uses LIFO (last-in, first-out), transferring inventory at the last purchase price. Likewise, the depreciation method used to value a firm's fixed assets over time may vary across firms. One firm may use straight-line depreciation, while another may use an accelerated depreciation

method (e.g., MACRS). Particularly, when reviewing cross-sectional ratios, differences in accounting rules can affect balance sheet values and financial ratios. It is important to know which accounting rules the firms under consideration are using before making any conclusions about their performance from ratio analysis.

LG3-8 13. What does it mean when a firm window dresses its financial statements?

Firms often window dress their financial statements to make annual results look better. For example, to improve liquidity ratios calculated with year-end balance sheets, firms often delay payments for raw materials, equipment, loans, and so on to build up their liquid accounts and thus their liquidity ratios. If possible, it is often more accurate to use other than year-end financial statements to conduct ratio analysis.

problems

basic 3-1 **Liquidity Ratios** You are evaluating the balance sheet for SophieLex Corporation. From the
problems balance sheet you find the following balances: cash and marketable securities = \$400,000; accounts receivable = \$1,200,000; inventory = \$2,100,000; accrued wages and taxes = \$500,000; accounts payable = \$800,000; and notes payable = \$600,000. Calculate SophieLex's current ratio, quick ratio, and cash ratio.

$$\text{Current ratio} = \frac{\$400,000 + \$1,200,000 + \$2,100,000}{\$500,000 + \$800,000 + \$600,000} = 1.95 \text{ times}$$

$$\text{Quick ratio (acid-test ratio)} = \frac{(\$400,000 + \$1,200,000 + \$2,100,000) - \$2,100,000}{\$500,000 + \$800,000 + \$600,000} = 0.84 \text{ times}$$

$$\text{Cash ratio} = \frac{\$400,000}{\$500,000 + \$800,000 + \$600,000} = 0.21 \text{ times}$$

LG3-1 3-2 **Liquidity Ratios** The top part of Ramakrishnan, Inc.'s 2021 and 2020 balance sheets is listed below (in millions of dollars). Calculate Ramakrishnan, Inc.'s current ratio, quick ratio, and cash ratio for 2021 and 2020.

Current assets:	<u>2021</u>	<u>2020</u>	Current liabilities:	<u>2021</u>	<u>2020</u>
Cash and marketable securities	\$ 34	\$ 25	Accrued wages and taxes	\$ 32	\$ 31
Accounts receivable	143	128	Accounts payable	87	76
Inventory	<u>206</u>	<u>187</u>	Notes payable	<u>76</u>	<u>68</u>
Total	\$383	\$340	Total	\$195	\$175

$$\text{Current ratio} = \frac{\begin{array}{cc} \mathbf{2021} & \mathbf{2020} \\ \$383\text{m.} & \$340\text{m.} \end{array}}{\begin{array}{cc} & \\ \$195\text{m.} & \$175\text{m.} \end{array}} = \frac{\$383\text{m.}}{\$195\text{m.}} = 1.96 \text{ times} \quad \frac{\$340\text{m.}}{\$175\text{m.}} = 1.94 \text{ times}$$

$$\text{Quick ratio (acid-test ratio)} = \frac{\$383\text{m.} - \$206\text{m.}}{\$195\text{m.}} = 0.91 \text{ times} \quad \frac{\$340\text{m.} - \$187\text{m.}}{\$175\text{m.}} = 0.87 \text{ times}$$

$$\text{Cash ratio} = \frac{\$34\text{m.}}{\$195\text{m.}} = 0.17 \text{ times} \quad \frac{\$25\text{m.}}{\$175\text{m.}} = 0.14 \text{ times}$$

- LG3-2 **3-3 Asset Management Ratios** Tater and Pepper Corp. reported sales for 2021 of \$23 million. Tater and Pepper listed \$5.6 million of inventory on its balance sheet. Using a 365 day year, how many days did Tater and Pepper's inventory stay on the premises? How many times per year did Tater and Pepper's inventory turn over?

$$\text{Days' sales in inventory} = \frac{\$5.6\text{m} \times 365}{\$23\text{m}} = 88.87 \text{ days}$$

$$\text{Inventory turnover} = \frac{\$23\text{m}}{\$5.6\text{m}} = 4.11 \text{ times}$$

- LG3-2 **3-4 Asset Management Ratios** Mr. Husker's Tuxedos Corp. ended the year 2021 with an average collection period of 32 days. The firm's credit sales for 2021 were \$56.1 million. What is the year-end 2021 balance in accounts receivable for Mr. Husker's Tuxedos?

$$\text{Average collection period (ACP)} = \frac{\text{Accounts receivable} \times 365}{\$56.1\text{m}} = 32 \text{ days}$$

$$\Rightarrow \text{Accounts receivable} = 32 \text{ days} \times \$56.1 \text{ m} / 365 = \$4,918,356$$

- LG3-3 **3-5 Debt Management Ratios** Tiggie's Dog Toys, Inc. reported a debt-to-equity ratio of 1.75 times at the end of 2021. If the firm's total debt at year-end was \$25 million, how much equity does Tiggie's have on its balance sheet?

$$\text{Debt-to-equity} = \frac{\text{Total debt}}{\text{Total equity}} = 1.75 = \frac{\$25 \text{ m}}{\text{Total equity}} \Rightarrow \text{Total equity} = \$25\text{m} / 1.75 = 14.29\text{m.}$$

- LG3-3 **3-6 Debt Management Ratios** You are considering a stock investment in one of two firms (LotsofDebt, Inc. and LotsofEquity, Inc.), both of which operate in the same industry. LotsofDebt, Inc. finances its \$30 million in assets with \$29 million in debt and \$1 million in equity. LotsofEquity, Inc. finances its \$30 million in assets with \$1 million in debt and \$29 million in equity. Calculate the debt ratio, equity multiplier, and debt-to-equity ratio for the two firms.

	$\frac{\text{LotsofDebt}}{\$29\text{m}}$	$\frac{\text{Lotsof Equity}}{\$1\text{m}}$
Debt ratio =	$\frac{\$29\text{m}}{\$30\text{m}} = 96.67\%$	$\frac{\$1\text{m}}{\$30\text{m}} = 3.33\%$
	$\frac{\$30\text{m}}{\$1\text{m}}$	$\frac{\$30\text{m}}{\$29\text{m}}$
Equity multiplier =	$\frac{\$30\text{m}}{\$1\text{m}} = 30 \text{ times}$	$\frac{\$30\text{m}}{\$29\text{m}} = 1.03 \text{ times}$
	$\frac{\$29\text{m}}{\$1\text{m}}$	$\frac{\$1\text{m}}{\$29\text{m}}$

$$\text{Debt-to-equity} = \frac{\text{Debt}}{\text{Equity}} = \frac{\text{Debt}}{\$1\text{m}} = 29 \text{ times} \quad \frac{\text{Debt}}{\text{Equity}} = \frac{\text{Debt}}{\$29\text{m}} = .03 \text{ times}$$

LG3-4 3-7 **Profitability Ratios** Maggie's Skunk Removal Corp.'s 2021 income statement listed net sales = \$12.5 million, gross profit of \$6.9 million, EBIT = \$5.6 million, net income available to common stockholders = \$3.2 million, and common stock dividends = \$1.2 million. The 2021 year-end balance sheet listed total assets of \$52.5 million and common stockholders' equity of \$21 million with 2 million shares outstanding. Calculate the gross profit margin, operating profit margin, profit margin, basic earnings power, ROA, ROE, and dividend payout.

$$\text{Gross profit margin} = \frac{\$6.9\text{m}}{\$12.5\text{m}} = 55.20\%$$

$$\text{Operating profit margin} = \frac{\$5.6\text{m}}{\$12.5\text{m}} = 44.80\%$$

$$\text{Profit margin} = \frac{\$3.2\text{m}}{\$12.5\text{m}} = 25.60\%$$

$$\text{Basic earnings power (BEP)} = \frac{\$5.6\text{m}}{\$52.5\text{m}} = 10.67\%$$

$$\text{Return on assets (ROA)} = \frac{\$3.2\text{m}}{\$52.5\text{m}} = 6.10\%$$

$$\text{Return on equity (ROE)} = \frac{\$3.2\text{m}}{\$21\text{m}} = 15.24\%$$

$$\text{Dividend payout} = \frac{\$1.2\text{m}}{\$3.2\text{m}} = 37.50\%$$

LG3-4 3-8 **Profitability Ratios** In 2021, Jake's Jamming Music, Inc., announced an ROA of 8.56 percent, ROE of 14.5 percent, and profit margin of 20.5 percent. The firm had total assets of \$9.5 million at year-end 2021. Calculate the 2021 values of net income available to common stockholders, common stockholders' equity, and net sales for Jake's Jamming Music, Inc.

$$\text{Return on assets (ROA)} = 0.0856 = \frac{\text{Net income available to common stockholders}}{\$9.5\text{m}}$$

$$\Rightarrow \text{Net income available to common stockholders} = 0.0856 \times \$9.5 \text{ m} = \$813,200$$

$$\text{Return on equity (ROE)} = 0.145 = \frac{\$813,200}{\text{Common stockholders' equity}}$$

$$\Rightarrow \text{Common stockholders' equity} = \$813,200 / 0.145 = \$5,608,276$$

$$\text{Profit margin} = 0.205 = \frac{\$813,200}{\text{Sales}} \Rightarrow \text{Sales} = \$813,200 / 0.205 = \$3,966,829$$

- LG3-5 **3-9 Market Value Ratios** You are considering an investment in Roxie's Bed & Breakfast Corp. During the last year the firm's income statement listed an addition to retained earnings of \$4.8 million and common stock dividends of \$2.2 million. Roxie's year-end balance sheet shows common stockholders' equity of \$35 million with 10 million shares of common stock outstanding. The common stock's market price per share was \$9.00. What is Roxie's Bed & Breakfast's book value per share and earnings per share? Calculate the market-to-book ratio and PE ratio.

$$\text{Book value per share} = \$35\text{m} / 10\text{m} = \$3.50 \text{ per share}$$

$$\text{Earnings per share} = (\$4.8\text{m} + \$2.2\text{m}) / 10\text{m} = \$0.70 \text{ per share}$$

$$\text{Market-to-book ratio} = \frac{\$9.00}{\$3.50} = 2.57 \text{ times}$$

$$\text{Price-earnings (PE) ratio} = \frac{\$9.00}{\$0.70} = 12.86 \text{ times}$$

- LG3-5 **3-10 Market Value Ratios** Dudley Hill Golf Club's market-to-book ratio is currently 2.5 times and the PE ratio is 6.75 times. If Dudley Hill Golf Club's common stock is currently selling at \$22.50 per share, what is the book value per share and earnings per share?

$$\text{Market-to-book ratio} = 2.50 = \frac{\$22.50}{\text{Book value per share}} \Rightarrow \text{Book value per share} = \$22.50 / 2.50 = \$9.00$$

$$\text{Price-earnings (PE) ratio} = 6.75 \text{ times} = \frac{\$22.50}{\text{Earnings per share}} \Rightarrow \text{Earnings per share} = \$22.50 / 6.75 = \$3.33$$

- LG3-6 **3-11 DuPont Analysis** If Silas 4-Wheeler, Inc., has an ROE of 18 percent, equity multiplier of 2, and a profit margin of 18.75 percent, what is the total asset turnover and the capital intensity?

$$\text{ROE} = 0.18 = 0.1875 \times \text{Total asset turnover} \times 2 \Rightarrow \text{Total asset turnover} = 0.18 / (0.1875 \times 2) = 0.48$$

$$\text{Capital intensity ratio} = 1/0.48 \text{ times} = 2.08 \text{ times}$$

- LG3-6 **3-12 DuPont Analysis** Last year, Hassan's Madhatter, Inc., had an ROA of 7.5 percent, a profit margin of 12 percent, and sales of \$25 million. Calculate Hassan's Madhatter's total assets.

$$\text{ROA} = 0.075 = 0.12 \times (\$25\text{m} / \text{Total assets}) \Rightarrow \text{Total assets} = (0.12 \times \$25\text{m}) / 0.075 = \$40\text{m}$$

- LG3-6 **3-13 Internal Growth Rate** Last year, Lakesha's Lounge Furniture Corporation had an ROA of 7.5 percent and a dividend payout ratio of 25 percent. What is the internal growth rate?

$$\text{Internal growth rate} = \frac{0.075 \times (1 - 0.25)}{1 - [0.075 \times (1 - 0.25)]} = 5.96\%$$

- LG3-6 3-14 **Sustainable Growth Rate** Last year, Lakesha's Lounge Furniture Corporation had an ROE of 17.5 percent and a dividend payout ratio of 20 percent. What is the sustainable growth rate?

$$\text{Sustainable growth rate} = \frac{0.175 \times (1 - 0.20)}{1 - [0.175 \times (1 - 0.20)]} = 16.28\%$$

intermediate

- problems 3-15 **Liquidity Ratios** Brenda's Bar and Grill has current liabilities of \$15 million. Cash makes up
 LG3-1 10 percent of the current assets and accounts receivable makes up another 40 percent of current assets. Brenda's current ratio is 2.1 times. Calculate the value of inventory listed on the firm's balance sheet.

$$\begin{aligned} \text{Current ratio} &= 2.1 = \text{Current assets} / \$15\text{m.} \Rightarrow \text{Current assets} = 2.1 \times \$15\text{m} = \$31.5\text{m} \\ \text{Cash} &= 0.10 \times \$31.5\text{m} = \$3.15\text{m} \\ \text{Accounts receivable} &= 0.40 \times \$31.5\text{m} = \$12.6\text{m} \\ \Rightarrow \text{Inventory} &= \$31.5\text{m} - \$3.15\text{m} - \$12.6\text{m} = \$15.75\text{m} \end{aligned}$$

- LG3-1 3-16 **Liquidity and Asset Management Ratios** Mandesa, Inc., has current liabilities of \$8 million,
 LG3-2 current ratio of 2 times, inventory turnover ratio of 12 times, average collection period of 30 days, and credit sales of \$64 million. Calculate the value of cash and marketable securities.

$$\text{Current ratio} = 2 \text{ times} = \frac{\text{Current assets}}{\$8\text{m}} \Rightarrow \text{Current assets} = 2 \times \$8\text{m} = \$16\text{m}$$

$$\text{Inventory turnover} = 12 \text{ times} = \frac{\$64\text{m}}{\text{Inventory}} \Rightarrow \text{Inventory} = \$64\text{m} / 12 = \$5,333,333$$

$$\text{Average collection period (ACP)} = 30 \text{ days} = \frac{\text{Accounts receivable} \times 365 \text{ days}}{\$64\text{m}}$$

$$\Rightarrow \text{Accounts receivable} = 30 \times \$64\text{m} / 365 = \$5,260,274$$

$$\Rightarrow \text{Cash and marketable securities} = \$16\text{m} - \$5,333,333 - \$5,260,274 = \$5,406,393$$

- LG3-2 3-17 **Asset Management and Profitability Ratios** You have the following information on Els'
 LG3-4 Putters, Inc.: sales to working capital is 4.6 times, profit margin is 20 percent, net income available to common stockholders is \$5 million, and current liabilities are \$6 million. What is the firm's balance of current assets?

$$\begin{aligned} \text{Profit margin} &= 0.2 = \$5\text{m} / \text{Sales} \Rightarrow \text{Sales} = \$5\text{m} / 0.2 = \$25\text{m} \\ \text{Sales} / (\text{Current assets} - \text{Current liabilities}) &= 4.6 = \$25\text{m} / (\text{Current assets} - \$6\text{m}) \\ \Rightarrow \text{Current assets} &= (\$25\text{m} / 4.6) + \$6\text{m} = \$11.43\text{m} \end{aligned}$$

- LG3-2 3-18 **Asset Management and Debt Management Ratios** Use the following information to complete the balance sheet below. Sales are \$8.8 million, capital intensity ratio is 2.10 times, debt ratio is 55 percent, and fixed asset turnover ratio is 1.2 times.

Step 1: Capital intensity ratio = 2.10 = Total assets / \$8.8m => Total assets = 2.1 x \$8.8m = \$18.48m
and Total liabilities and equity = \$18.48m

Step 2: Debt ratio = 0.55 = Total debt / \$18.48m => Total debt = 0.55 x \$18.48m = \$10.164m

Step 3: Total equity = \$18.48m - \$10.164m = \$8.316m

Step 4: Fixed asset turnover = 1.2 = \$8.8m / Fixed assets => Fixed assets = \$8.8m / 1.2 = \$7.333m

Step 5: Current assets = \$18.48m - \$7.333m = \$11.147m

Assets	Liabilities and Equity
Current assets Step 5 <u>\$11.147m</u>	Total liabilities Step 2 <u>\$10.164m</u>
Fixed assets Step 4 <u>\$7.333m</u>	Total equity Step 3 <u>\$8.316m</u>
Total assets Step 1 <u>\$18.480m</u>	Total liabilities and equity <u>\$18.480m</u>

- LG3-3 3-19 **Debt Management Ratios** Tiggie's Dog Toys, Inc., reported a debt-to-equity ratio of 1.75 times at the end of 2021. If the firm's total assets at year-end were \$25 million, how much of their assets are financed with debt and how much with equity?

Debt to equity = 1.75 = Total debt / Total equity = Total debt / (Total assets – Total debt)
 $1.75 = \text{Total debt} / (\$25\text{m} - \text{Total debt}) \Rightarrow 1.75 \times (\$25\text{m} - \text{Total debt}) = \text{Total debt}$
 $\Rightarrow (1.75 \times \$25\text{m}) - (1.75 \times \text{Total debt}) = \text{Total debt} \Rightarrow \$43.75\text{m} = 2.75 \times \text{Total debt}$
 $\Rightarrow \text{Total debt} = \$43.75\text{m} / 2.75 = \$15.909\text{m}$
 $\Rightarrow \text{Total equity} = \$25\text{m} - \$15.909\text{m} = \9.091m

- LG3-3 3-20 **Debt Management Ratios** Calculate the times interest earned ratio for LaTonya's Flop Shops, Inc., using the following information. Sales are \$1.5 million, cost of goods sold is \$600,000, depreciation expense is \$150,000, other operating expenses is \$300,000, addition to retained earnings is \$176,625, dividends per share is \$1, tax rate is 21 percent, and number of shares of common stock outstanding is 90,000. LaTonya's Flop Shops has no preferred stock outstanding.

Net sales (all credit)		\$1,500,000
Less: Cost of goods sold		<u>600,000</u>
Gross profits	Step 4.	<u>\$900,000</u>
Less: Depreciation		150,000
Other operating expenses		<u>300,000</u>
Earnings before interest and taxes (EBIT)	Step 5.	<u>\$450,000</u>
Less: Interest	Step 6.	<u>112,500</u>
Earnings before taxes (EBT)	Step 3.	<u>\$337,500</u>
Less: Taxes		
Net income	Step 2.	<u><u>\$266,625</u></u>
Less: Common stock dividends	Step 1.	<u>\$90,000</u>
Addition to retained earnings		\$176,625

Step 1. Common stock dividends = \$1 per share x 90,000 shares = \$90,000

Step 2. Net income = Common stock dividends + Addition to retained earnings = \$90,000 + \$146,250 = \$266,625

Step 3. EBT (1 – Tax rate) = Net income => EBT = Net income / (1 – Tax rate) = \$266,625 / (1 - 0.21) = \$337,500

Step 4. Gross profits = Net sales – Cost of goods sold = \$1,500,000 – \$600,000 = \$900,000

Step 5. Gross profits – Depreciation – Other operating expenses = EBIT = \$900,000 - \$150,000 - \$300,000 = \$450,000

Step 6. EBIT – Interest = EBT => Interest = EBIT - EBT = \$450,000 - \$337,500 = **\$112,500**

=> Times interest earned = \$450,000 / \$112,500 = 4.00 times

- LG3-2 **3-21 Profitability and Asset Management Ratios** You are thinking of investing in Nikki T's, Inc.
 LG3-4 You have only the following information on the firm at year-end 2021: net income is \$250,000, total debt is \$2.5 million, and debt ratio is 55 percent. What is Nikki T's ROE for 2021?

Debt ratio = 0.55 = \$2.5m / Total assets => Total assets = \$2.5m / 0.55 = \$4.545m

=> Total equity = \$4.545m - \$2.5m = \$2.045m

=> ROE = \$250,000 / \$2.045m = 12.22%

- LG3-4 **3-22 Profitability Ratios** Rick's Travel Service has asked you to help piece together financial information on the firm for the most current year. Managers give you the following information: sales are \$8.2 million, total debt is \$2.1 million, debt ratio is 40 percent, and ROE is 18 percent. Using this information, calculate Rick's ROA.

Debt ratio = 0.40 = \$2.1m / Total assets => Total assets = \$2.1m / 0.40 = \$5.25m

=> Total equity = \$5.25m - \$2.1m = \$3.15m

=> ROE = 0.18 = Net income / \$3.15m => Net income = 0.18 x \$3.15m = \$567,000

=> ROA = \$567,000 / \$5.25m = 10.80%

- LG3-5 **3-23 Market Value Ratios** Leonatti Labs' year-end price on its common stock is \$35. The firm has total assets of \$50 million, debt ratio of 65 percent, no preferred stock, and 3 million shares of common stock outstanding. Calculate the market-to-book ratio for Leonatti Labs.

Debt ratio = 0.65 = Total debt / \$50m => Total debt = 0.65 x \$50m = \$32.5m

=> Total equity = \$50m - \$32.5m = \$17.5m

=> Book value of equity = \$17.5m / 3m = \$5.83333 per share

=> Market to book ratio = \$35 / \$5.83333 = 6 times

- LG3-5 **3-24 Market Value Ratios** Leonatti Labs' year-end price on its common stock is \$15. The firm has a profit margin of 8 percent, total assets of \$42 million, a total asset turnover ratio of 0.75, no preferred stock, and 3 million shares of common stock outstanding. Calculate the PE ratio for Leonatti Labs.

Total asset turnover = 0.75 = Sales / \$42m => Sales = \$42m x 0.75 = \$31.50m

=> Profit margin = 0.08 = Net income / \$31.50m => Net income = 0.08 x \$31.50m = \$2.52m

=> EPS = \$2.52m / 3m shares = \$0.84 per share

=> PE ratio = \$15 / \$0.84 = 17.86 times

- LG3-6 **3-25 DuPont Analysis** Last year, Stumble-on-Inn, Inc., reported an ROE of 18 percent. The firm's debt ratio was 55 percent, sales were \$15 million, and the capital intensity was 1.25 times. Calculate the net income for Stumble-on-Inn last year.

Capital intensity = 1.25 = Total assets / \$15m => Total assets = 1.25 x \$15m = \$18.75m

$\Rightarrow \text{Debt ratio} = 0.55 = \text{Total debt} / \$18.75\text{m} \Rightarrow \text{Total debt} = 0.55 \times \$18.75\text{m} = \$10.3125\text{m}$
 $\Rightarrow \text{Total equity} = \$18.75\text{m} - \$10.3125\text{m} = \8.4375m
 $\Rightarrow \text{ROE} = 0.18 = \text{Net income} / \$8.4375\text{m} \Rightarrow \text{Net income} = 0.18 \times \$8.4375\text{m} = \$1,518,750$

- LG3-6 3-26 **DuPont Analysis** You are considering investing in Nuran Security Services. You have been able to locate the following information on the firm: total assets are \$24 million, accounts receivable are \$3.3 million, ACP is 25 days, net income is \$3.5 million, and debt-to-equity is 1.2 times. Calculate the ROE for the firm.

$\text{Debt-to-equity} = 1.2 = \text{Total debt} / \text{Total equity} = \text{Total debt} / (\text{Total assets} - \text{Total debt})$
 $1.2 = \text{Total debt} / (\$24\text{m} - \text{Total debt}) \Rightarrow (1.2 \times \$24\text{m}) - 1.2 \times \text{Total debt} = \text{Total debt}$
 $\Rightarrow \$28.8\text{m} = 2.2 \times \text{Total debt} \Rightarrow \text{Total debt} = \$28.8\text{m} / 2.2 = \$13.091\text{m}$
 $\Rightarrow \text{Total equity} = \$24\text{m} - \$13.091\text{m} = \10.909m
 $\Rightarrow \text{ROE} = \$3.5\text{m} / \$10.909\text{m} = 32.08\%$

- LG3-6 3-27 **Internal Growth Rate** Dogs R Us reported a profit margin of 10.5 percent, total asset turnover of 0.75 times, debt-to-equity of 0.80 times, net income of \$500,000, and dividends paid to common stockholders of \$200,000. The firm has no preferred stock outstanding. What is Dogs R Us's internal growth rate?

$\text{ROA} = \text{Profit margin} \times \text{Total asset turnover} = 10.5\% \times 0.75 = 7.875\%$
 $\text{RR} = (\$500,000 - \$200,000) / \$500,000 = 0.60$

$$\text{Internal growth rate} = \frac{\text{ROA} \times \text{RR}}{1 - (\text{ROA} \times \text{RR})} = \frac{0.07875 \times 0.60}{1 - (0.07875 \times 0.60)} = 4.96\%$$

- LG3-6 3-28 **Sustainable Growth Rate** You have located the following information on Webb's Heating & Air Conditioning: debt ratio is 54 percent, capital intensity ratio is 1.10 times, profit margin is 12.5 percent, and dividend payout ratio is 25 percent. Calculate the sustainable growth rate for Webb.

$\text{Equity multiplier} = \text{Total assets} / \text{Total equity} \Rightarrow 1 / \text{Equity multiplier} = \text{Total equity} / \text{Total assets}$
 $\text{Debt ratio} = \text{Total debt} / \text{Total assets} = (\text{Total assets} - \text{Total equity}) / \text{Total assets} = 1 - (\text{Total equity} / \text{Total assets})$
 $0.54 = 1 - (\text{Total equity} / \text{Total assets}) \Rightarrow \text{Total equity} / \text{Total assets} = 1 - 0.54 = 0.46 = 1 / \text{Equity multiplier}$
 $\Rightarrow \text{Equity multiplier} = 1 / 0.46 = 2.1739$

$\text{ROE} = \text{Profit margin} \times \text{Total asset turnover} \times \text{Equity multiplier}$
 $= 0.125 \times 1 / 1.10 \times 2.1739 = 24.70\%$

$\text{Retention ratio (RR)} = 1 - \text{Dividend payout ratio} = 1 - 0.25 = 0.75$

$$\text{Sustainable growth rate} = \frac{0.2470 \times 0.75}{1 - (0.2470 \times 0.75)} = 22.74\%$$

Use the following financial statements for Lake of Egypt Marina to answer Problems 3-29 through 3-32.

Lake of Egypt Marina, Inc.
Balance Sheet as of December 31, 2021 and 2020
(in millions of dollars)

Assets	2021	2020	Liabilities & Equity	2021	2020
Current assets:			Current liabilities:		
Cash and marketable securities	\$ 75	\$ 65	Accrued wages and taxes	\$ 40	\$ 43
Accounts receivable	115	110	Accounts payable	90	80
Inventory	<u>200</u>	<u>190</u>	Notes payable	<u>80</u>	<u>70</u>
Total	\$ 390	\$ 365	Total	\$ 210	\$ 193
Fixed assets:			Long-term debt:	\$ 300	\$ 280
Gross plant and equipment	\$ 580	\$ 471	Stockholders' equity:		
Less: Depreciation	<u>110</u>	<u>100</u>	Preferred stock (5 million shares)	\$ 5	\$ 5
Net plant and equipment	\$ 470	\$ 371	Common stock and paid-in surplus	65	65
Other long-term assets	<u>50</u>	<u>49</u>	(65 million shares)		
Total	\$ 520	\$ 420	Retained earnings	<u>330</u>	<u>242</u>
			Total	\$ 400	\$ 312
Total assets	\$ 910	\$ 785	Total liabilities and equity	\$ 910	\$ 785

Lake of Egypt Marina, Inc.
Income Statement for Years Ending December 31, 2021 and 2020
(in millions of dollars)

	2021	2020
Net sales (all credit)	\$ 515	\$ 432
Less: Cost of goods sold	<u>230</u>	<u>175</u>
Gross profits	\$285	\$257
Less: Other operating expenses	<u>30</u>	<u>25</u>
Earnings before interest, taxes, depreciation, and amortization (EBITDA)	\$255	\$232
Less: Depreciation	<u>22</u>	<u>20</u>
Earnings before interest and taxes (EBIT)	\$233	\$212
Less: Interest	<u>33</u>	<u>30</u>
Earnings before taxes (EBT)	\$200	\$182
Less: Taxes	<u>57</u>	<u>55</u>
Net income	<u>\$ 143</u>	<u>\$ 127</u>
Less: Preferred stock dividends	<u>\$ 5</u>	<u>\$ 5</u>
Net income available to common stockholders	\$ 138	\$ 122
Less: Common stock dividends	<u>65</u>	<u>65</u>
Addition to retained earnings	\$ 73	\$ 57
Per (common) share data:		
Earnings per share (EPS)	\$2.123	\$1.877
Dividends per share (DPS)	\$1.000	\$1.000
Book value per share (BVPS)	\$6.077	\$4.723
Market value (price) per share (MVPS)	\$14.750	\$12.550

LG3-1 through LG3-7 3-29 **Spreading the Financial Statements** Spread the balance sheets and income statements of Lake of Egypt Marina, Inc. for 2021 and 2020.

Spread the balance sheet:

Lake of Egypt Marina, Inc. Balance Sheet as of December 31, 2021 and 2020 (in millions of dollars)					
Assets	2021	2020	Liabilities & Equity	2021	2020
Current assets:			Current liabilities:		
Cash and marketable securities	8.24%	8.28%	Accrued wages and taxes	4.40%	5.48%
Accounts receivable	12.64	14.01	Accounts payable	9.89	10.19
Inventory	<u>21.98</u>	<u>24.20</u>	Notes payable	<u>8.79</u>	<u>8.92</u>
Total	42.86	46.50	Total	23.08	24.59
Fixed assets:			Long-term debt:	32.97	35.67
Gross plant and equipment	63.74	60.00	Stockholders' equity:		
Less: Depreciation	<u>12.09</u>	<u>12.74</u>	Preferred stock (5 million shares)	0.55	0.64
Net plant and equipment	51.65	47.26	Common stock and paid-in surplus	7.14	8.28
Other long-term assets	<u>5.49</u>	<u>6.24</u>	(65 million shares)		
Total	57.14	53.50	Retained earnings	<u>36.26</u>	<u>30.83</u>
			Total	43.96	39.75
Total assets	<u>100.00%</u>	<u>100.00%</u>	Total liabilities and equity	<u>100.00%</u>	<u>100.00%</u>

Spreading the income statement:

Lake of Egypt Marina, Inc. Income Statement for Years Ending December 31, 2021 and 2020 (in millions of dollars)		
	2021	2020
Net sales (all credit)	100.00%	100.00%
Less: Cost of goods sold	<u>44.66</u>	<u>40.51</u>
Gross profits	55.34	59.49
Less: Other operating expenses	<u>5.83</u>	<u>5.79</u>
Earnings before interest, taxes, depreciation, and amortization (EBITDA)	49.51	53.70
Less: Depreciation	<u>4.27</u>	<u>4.63</u>
Earnings before interest and taxes (EBIT)	45.24	49.07
Less: Interest	<u>6.41</u>	<u>6.94</u>
Earnings before taxes (EBT)	38.83	42.13
Less: Taxes	<u>8.15</u>	<u>12.73</u>
Net income	<u>30.68%</u>	<u>29.40%</u>

LG3-1 through LG3-7 **3-30 Calculating Ratios** Calculate the following ratios for Lake of Egypt Marina, Inc. as of year-end 2021.

	Lake of Egypt Marina, Inc. (dollar amounts are in millions for parts a through w.)	Industry
a. Current ratio	\$390 / \$210 = 1.86 times	2.00 times
b. Quick ratio	(\$390 - \$200) / \$210 = 0.90 times	1.20 times
c. Cash ratio	\$75 / \$210 = 0.36 times	0.42 times
d. Inventory turnover	\$515 / \$200 = 2.58 times	3.60 times

e. Days' sales in inventory	$(\$200 \times 365) / \$515 = 141.75$ days	101.39 days
f. Average collection period	$(\$115 \times 365) / \$515 = 81.50$ days	32.50 days
g. Average payment period	$(\$90 \times 365) / \$230 = 142.83$ days	45.00 days
h. Fixed asset turnover	$\$515 / \$470 = 1.10$ times	1.25 times
i. Sales to working capital	$\$515 / (\$390 - \$210) = 2.86$ times	4.25 times
j. Total asset turnover	$\$515 / \$910 = 0.57$ times	0.85 times
k. Capital intensity	$\$910 / \$515 = 1.77$ times	1.18 times
l. Debt ratio	$(\$210 + \$300) / \$910 = 56.04\%$	62.50%
m. Debt-to-equity	$(\$210 + \$300) / \$400 = 1.28$ times	1.67 times
n. Equity multiplier (using total equity)	$\$910 / \$400 = 2.28$ times	2.67 times
o. Times interest earned	$\$233 / \$33 = 7.06$ times	8.50 times
p. Cash coverage	$(\$233 + \$22) / \$33 = 7.73$ times	8.75 times
q. Profit margin	$\$153 / \$515 = 29.71\%$	30.75%
r. Gross profit margin	$\$285 / \$515 = 55.34\%$	56.45%
s. Operating profit margin	$\$233 / \$515 = 45.24\%$	46.78%
t. Basic earnings power	$\$233 / \$910 = 25.60\%$	32.50%
u. ROA	$\$153 / \$910 = 16.81\%$	19.75%
v. ROE	$\$153 / \$395 = 38.73\%$	51.35%
w. Dividend payout	$\$65 / \$153 = 42.48\%$	35.00%
x. Market-to-book ratio	$\$14.750 / \$6.077 = 2.43$ times	2.55 times
y. PE ratio	$\$14.750 / \$2.354 = 6.27$ times	15.60 times

LG3-1 through LG3-7 **3-31 DuPont Analysis** Construct the DuPont ROA and ROE breakdowns for Lake of Egypt Marina, Inc.

ROA = Profit margin x Total asset turnover = $29.708738\% \times 0.56593407$ times = 16.81%

ROE = Profit margin x Total asset turnover x Equity multiplier = $29.708738\% \times 0.56593407$ times x $(910\text{m}/395\text{m}) = 38.73\%$

LG3-1 through LG3-7 **3-32 Internal and Sustainable Growth Rates** Calculate the internal and sustainable growth rate for Lake of Egypt Marina, Inc.

$$\text{Internal growth rate} = \frac{0.1681 \times (1 - 0.4248)}{1 - (0.1681 \times (1 - 0.4248))} = 10.71\%$$

$$\text{Sustainable growth rate} = \frac{0.3873 \times (1 - 0.4248)}{1 - (0.3873 \times (1 - 0.4248))} = 28.66\%$$

LG3-1 through LG3-7 **3-33 Cross-sectional Analysis** Using the ratios from question 3-30 for Lake of Egypt Marina, Inc. and the industry, what can you conclude about Lake of Egypt Marina's financial performance for 2021.

Lake of Egypt Marina is performing below the industry in all areas. Liquidity is lower, asset management is poorer, and profit ratios are lower.

advanced problems **3-34 Ratio Analysis** Use the following information to complete the balance sheet below.

LG3-1
through
LG3-5

Current ratio = 2.5 times
Profit margin = 10%
Sales = \$1,200m
ROE = 20%
Long-term debt to Long-term debt and equity = 55%

Current assets	\$ _____	Current liabilities	\$210m
Fixed assets	_____	Long-term debt	_____
		Stockholders' equity	_____
Total Assets	<u>\$ _____</u>	Total liabilities & equity	<u>\$ _____</u>

Step 1: Current ratio = 2.5 times = Current assets / \$210m => Current assets = 2.5 x \$210m = \$525m

Step 2: Profit margin = 10% = Net income / \$1,200m => Net income = 0.10 x \$1,200m = \$120m

=> ROE = 20% = \$120m / Total equity => Total equity = \$120m / 0.20 = \$600m

Step 3: Long-term debt / Long-term debt and equity = 55% => 0.55(Long-term debt + \$600m) = Long-term debt

=> (0.55 x Long-term debt) + (0.55 x \$600m) = Long-term debt => \$330m = (1 - 0.55) x Long-term debt

=> Long-term debt = \$330m / (1 - 0.55) = \$733m

Step 4: Total liabilities & equity = Current liabilities + Long-term debt + Stockholders' equity = \$210m + \$733m + \$600m. = \$1,543m = Total assets

Step 5: Fixed assets = Total assets - Current assets = \$1,543m - \$525m = \$1,018m

Current Assets	Step 1	\$525m	Current Liabilities		\$210m
Fixed Assets	Step 5	1,018m	Long-term Debt	Step 3	733m
			Stockholders' Equity	Step 2	<u>600m</u>
Total Assets		<u>\$1,543m</u>	Step 4	Total Liabilities & Equity	<u>\$1,543m</u>

LG3-1
through
LG3-5

3-35 Ratio Analysis Use the following information to complete the balance sheet below.

Current ratio = 2.20 times
Credit sales = \$1,200m
Average collection period = 60 days
Inventory turnover = 1.50 times
Total asset turnover = 0.75 times
Debt ratio = 60%

Cash	\$ _____	Current liabilities	\$500m
Accounts receivable	_____	Long-term debt	_____
Inventory	_____	Total debt	<u>\$ _____</u>
Current assets	<u>\$ _____</u>		
Fixed assets	_____	Stockholders' equity	_____
Total assets	<u>\$ _____</u>	Total liabilities & equity	<u>\$ _____</u>

Step 1: Current ratio = 2.2 times = Current assets / \$500m \Rightarrow Current assets = 2.2 x \$500m = \$1,100m
Step 2: Average collection period = 60 days = (Accounts receivable x 365) / \$1,200m
 \Rightarrow Accounts receivable = (60 x \$1,200m) / 365 = \$197m
Step 3: Inventory turnover = 1.5 times = \$1,200m / Inventory \Rightarrow Inventory = \$1,200m / 1.5 = \$800m
Step 4: Cash = \$1,100m - \$197m - \$800m = \$103m
Step 5: Total asset turnover = 0.75 times = \$1,200m / Total assets \Rightarrow Total assets = \$1,200m / 0.75 = \$1,600m
Step 6: Fixed assets = \$1,600m - \$1,100m = \$500m
Step 7: Debt ratio = 60% = Total debt / \$1,600m \Rightarrow Total debt = 0.60 x \$1,600m = \$960m
Step 8: Stockholders' equity = Total liabilities & equity - Total debt = \$1,600m - \$960m = \$ 640m
Step 9: Long-term debt = Total debt - Current liabilities = \$960m - \$500m = \$460m

Cash	Step 4	\$103m			
Accounts receivable	Step 2	197m	Current liabilities		\$500m
Inventory	Step 3	<u>800m</u>	Long-term debt	Step 9	<u>460m</u>
Current assets	Step 1	\$1,100m	Total debt	Step 7	<u>\$960m</u>
Fixed assets	Step 6	<u>500m</u>	Stockholders' equity	Step 8	<u>640m</u>
Total assets		<u>\$1,600m</u>	Total liabilities & equity	Step 5	<u>\$1,600m</u>

LG3-6 3-36 DuPont Analysis Last year, K9 WebbWear, Inc., reported an ROE of 20 percent. The firm's debt ratio was 55 percent, sales were \$20 million, and the capital intensity was 1.25 times. Calculate the net income and profit margin for K9 WebbWear last year. This year, K9 WebbWear plans to increase its debt ratio to 60 percent. The change will not affect sales or total assets; however, it will reduce the firm's profit margin to 11 percent. By how much will the change in K9 WebbWear's debt ratio affect its ROE?

Last year: Capital intensity = 1.25 = Total assets / \$20m \Rightarrow Total assets = 1.25 x \$20m = \$25m
 \Rightarrow Debt ratio = 0.55 = Total debt / \$25m \Rightarrow Total debt = 0.55 x \$25m = \$13.75m
 \Rightarrow Total equity = \$25m - \$13.75m = \$11.25m
 \Rightarrow ROE = 0.20 = Net income / \$11.25m \Rightarrow Net income = 0.20 x \$11.25m = \$2.25m
 \Rightarrow Profit margin = \$2.25m / \$20m = 11.25%

This year: Profit margin = 11% = Net income / \$20m \Rightarrow Net income = 0.11 x \$20m = \$2.2m
 and Total debt = \$25m x 0.60 = \$15m
 \Rightarrow Total equity = \$25m - \$15m = \$10m
 \Rightarrow ROE = \$2.2m / \$10m = 22%, an increase of 2%

LG3-6 3-37 DuPont Analysis You are considering investing in Dakota's Security Services. You have been able to locate the following information on the firm: total assets are \$32 million, accounts receivable are \$4.4 million, ACP is 25 days, net income is \$4.66 million, and debt-to-equity is 1.2 times. All sales are on credit. Dakota's is considering loosening its credit policy such that ACP will increase to 30 days. The change is expected to increase credit sales by 5 percent. Any change in accounts receivable will be offset with a change in debt. No other balance sheet changes are expected. Dakota's profit margin will remain unchanged. How will this change in accounts receivable policy affect Dakota's net income, total asset turnover, equity multiplier, ROA, and ROE?

Current: ACP = (Accounts receivable x 365) / Credit sales = 25 = (\$4.4m x 365) / Credit sales
 \Rightarrow Credit sales = (\$4.4m x 365) / 25 = \$64.24m
 \Rightarrow Profit margin = \$4.66m / \$64.24m = 7.25%
 Total asset turnover = \$64.24m / \$32m = 2.0075 times

Debt-to-equity = Equity multiplier – 1 = 1.2 => Equity multiplier = 1 + 1.2 = 2.2

ROA = Net income / Total assets = \$4.66m / \$32m = 14.56%

or = Profit margin x Total asset turnover = 7.25% x 2.0075 = 14.56%

Equity multiplier = Total assets / Total equity = 2.2 = \$32m / Total equity

=> Total equity = \$32m / 2.2 = \$14.545m and Total debt = \$32m - \$14.545m = \$17.454m

=> ROE = \$4.66m / \$14.545m = 32.04%

or = Profit margin x Total asset turnover x Equity multiplier = 7.25% x 2.0075 x 2.2 = 32.04%

New: ACP = 30 = (Accounts receivable x 365) / \$64.24m (1.05)

=> Accounts receivable = (30 x \$64.24m (1.05)) / 365 = \$5.544m, an increase of \$5.544m - \$4.4m = \$1.144m

=> Total assets = \$32m + \$1.144m = \$33.144m

and Total debt = \$17.454m + 1.144m = \$18.595m so Total equity = \$33.144m - \$18.595m = \$14.545m

Equity multiplier = \$33.144m / \$14.545m = 2.2786 times

Profit margin = 7.25% = Net income / \$64.24m (1.05) => Net income = 7.25% x \$64.24m (1.05) = \$4.893m

Total asset turnover = \$64.24m(1.05) / \$33.144m = 2.0351

=> ROA = \$4.893m / \$33.144m = 14.76% or = 7.25% x 2.0351 = 14.76%

=> ROE = \$4.893m / \$14.545m = 33.64% or = 7.25% x 2.0351 x 2.2786 = 33.64%

Change in net income = \$4.893m – \$4.66 = \$0.233m - net income increases

Change in total asset turnover = 2.0351 times – 2.0075 times = 0.0276 times - assets are turned over faster

Change in equity multiplier = 2.2786 times – 2.2 times = 0.0786 times - each \$ of equity supports more \$s of assets

Change in ROA = 14.76% - 14.56% = 0.20% - return on assets increases

Change in ROE = 33.64% - 32.04% = 1.60% - return on equity increases

LG3-6 3-38 Internal Growth Rate Last year, Marly Brown, Inc., reported an ROE of 20 percent. The firm's debt-to-equity was 1.50 times, sales were \$20 million, the capital intensity was 1.25 times, and dividends paid to common stockholders were \$1,000,000. The firm has no preferred stock outstanding. This year, Marly Brown plans to decrease its debt-to-equity ratio to 1.20 times. The change will not affect sales, total assets, or dividends paid; however, it will reduce the firm's profit margin to 9.85 percent. Use the DuPont equation to determine how the change in Marly Brown's debt ratio will affect its internal growth rate.

Last year: Capital intensity = 1.25 => Total asset turnover = 1 / 1.25 = 0.80

Capital intensity = 1.25 = Total assets / \$20m => Total assets = 1.25 x \$20m = \$25m

Debt-to-equity ratio = 1.50 times => Debt ratio = 1 / [(1/Debt-to-equity) + 1] = 1 / [(1/1.50) + 1] = 0.60 or 60%

=> Debt ratio = 0.60 = Total debt / \$25m => Total debt = 0.60 x \$25m = \$15.00m

=> Total equity = \$25m - \$15.00m = \$10.00m

=> ROE = 0.20 = Net income / \$10.00m => Net income = 0.20 x \$10.00m = \$2.00m

=> Profit margin = \$2.00m / \$20.00m = 10.00%

ROA = Profit margin x Total asset turnover = 10.00% x 0.80 = 8.00%

RR = (\$2,000,000 - \$1,000,000) / \$2,000,000 = 0.50

$$\text{Internal growth rate} = \frac{\text{ROA} \times \text{RR}}{1 - (\text{ROA} \times \text{RR})} = \frac{0.0800 \times 0.50}{1 - (0.0800 \times 0.50)} = 4.17\%$$

This year: $ROA = 9.85\% \times 0.80 = 7.88\%$

Profit margin = $9.85\% = \text{Net income} / \$20\text{m} \Rightarrow \text{Net income} = 0.0985 \times \$20\text{m} = \$1.97\text{m}$

$RR = (\$1,970,000 - \$1,000,000) / \$1,970,000 = 0.4924$

$$\text{Internal growth rate} = \frac{0.0788 \times 0.4924}{1 - (0.0788 \times 0.4924)} = 4.04\%, \text{ a decrease of } 0.13\%$$

LG3-6

3-39 Sustainable Growth Rate You are considering investing in Annie's Eatery. You have been able to locate the following information on the firm: total assets are \$40 million, accounts receivable are \$6.0 million, ACP is 30 days, net income is \$4.75 million, debt-to-equity is 1.5 times, and dividend payout ratio is 45 percent. All sales are on credit. Annie's is considering loosening its credit policy such that ACP will increase to 35 days. The change is expected to increase credit sales by 5 percent. Any change in accounts receivable will be offset with a change in debt. No other balance sheet changes are expected. Annie's profit margin and dividend payout ratio will remain unchanged. Use the DuPont equation to determine how this change in accounts receivable policy will affect Annie's sustainable growth rate.

Current: $ACP = (\text{Accounts receivable} \times 365) / \text{Credit sales} = 30 = (\$6.0\text{m} \times 365) / \text{Credit sales}$

$\Rightarrow \text{Credit sales} = (\$6.0\text{m} \times 365) / 30 = \73.00m

$\Rightarrow \text{Profit margin} = \$4.75\text{m} / \$73.00\text{m} = 6.51\%$

Total asset turnover = $\$73.00\text{m} / \$40\text{m} = 1.825 \text{ times}$

Debt-to-equity = $\text{Equity multiplier} - 1 = 1.5 \Rightarrow \text{Equity multiplier} = 1 + 1.5 = 2.5$

Equity multiplier = $\text{Total assets} / \text{Total equity} = 2.5 = \$40\text{m} / \text{Total equity}$

$\Rightarrow \text{Total equity} = \$40\text{m} / 2.5 = \$16.00\text{m}$ and $\text{Total debt} = \$40\text{m} - \$16\text{m} = \$24\text{m}$

$\Rightarrow \text{ROE} = \$4.75\text{m} / \$16.00\text{m} = 29.69\%$

or $= \text{Profit margin} \times \text{Total asset turnover} \times \text{Equity multiplier} = 6.51\% \times 1.825 \times 2.5 = 29.69\%$

Retention ratio (RR) = $1 - \text{Dividend payout ratio} = 1 - 0.45 = 0.55$

$$\text{Sustainable growth rate} = \frac{0.2969 \times 0.55}{1 - (0.2969 \times 0.55)} = 19.51\%$$

New: $ACP = 35 = (\text{Accounts receivable} \times 365) / \$73\text{m} (1.05)$

$\Rightarrow \text{Accounts receivable} = (35 \times \$73\text{m} (1.05)) / 365 = \7.35m , an increase of $\$7.35\text{m} - \$6.0\text{m} = \$1.35\text{m}$

$\Rightarrow \text{Total assets} = \$40\text{m} + \$1.35\text{m} = \41.35m

and $\text{Total debt} = \$24\text{m} + \$1.35\text{m} = \$25.35\text{m}$ so $\text{Total equity} = \$41.35\text{m} - \$25.35\text{m} = \$16.00\text{m}$

Equity multiplier = $\$41.35\text{m} / \$16.00\text{m} = 2.5844 \text{ times}$

Profit margin = $6.51\% = \text{Net income} / \$73.00\text{m} (1.05) \Rightarrow \text{Net income} = 6.51\% \times \$73.00\text{m} (1.05) = \$4.9875\text{m}$

Total asset turnover = $\$73.00\text{m}(1.05) / \$41.35\text{m} = 1.8537$

$\Rightarrow \text{ROE} = \$4.9875 / \$16.00\text{m} = 31.17\%$ or $= 6.51\% \times 1.8537 \times 2.5844 = 31.17\%$

Retention ratio (RR) = $1 - \text{Dividend payout ratio} = 1 - 0.45 = 0.55$

Chapter 03 - Analyzing Financial Statements

$$\text{Sustainable growth rate} = \frac{0.3117 \times 0.55}{1 - (0.3117 \times 0.55)} = 20.69\%, \text{ an increase of } 1.18\%$$

research it! Analyzing Financial Statements

Go the Web site of Wal-Mart Stores, Inc. at www.walmartstores.com and get the latest financial statements from the annual report using the following steps.

Click on “Investors.” Click on “Annual Reports.” Click on the most recent date. This will bring the file onto your computer that contains the relevant data. Using the most recent balance sheet and income statement, calculate the financial ratios for the firm, including the internal and sustainable growth rates.

SOLUTION: The solution will vary with the annual report accessed. However, these financial statements provide information on the firm’s financial position at a point in time or its operations over some past period of time. But these financial statements’ real value lies in the fact that managers, investors, and analysts can use the information the statements contain to analyze the current financial performance or condition of the firm. More importantly, managers can use this information to plan changes that will improve the firm’s future performance and, ultimately, its market value.

integrated mini-case: Working with Financial Statements

Listed below are the 2021 financial statements for Garners’ Platoon Mental Health Care, Inc. Spread the balance sheet and income statement. Calculate the financial ratios for the firm, including the internal and sustainable growth rates. Using the DuPont system of analysis and the industry ratios reported below, evaluate the performance of the firm.

Garners’ Platoon Mental Health Care, Inc. Balance Sheet as of December 31, 2021 (in millions of dollars)			
Assets		Liabilities and Equity	
Current assets:		Current liabilities :	
Cash and marketable securities	\$ 421	Accrued wages and taxes	\$ 316
Accounts receivable	1,109	Accounts payable	867
Inventory	<u>1,760</u>	Notes payable	<u>872</u>
Total	\$3,290	Total	\$2,055
Fixed assets:		Long-term debt:	
Gross plant and equipment	\$5,812		\$3,090
Less: Depreciation	<u>840</u>	Stockholders’ equity:	
Net plant and equipment	\$4,972	Preferred stock (30 million shares)	\$ 60
Other long-term assets	<u>892</u>	Common stock and paid-in surplus	637
Total	\$5,864	(200 million shares)	
		Retained earnings	<u>3,312</u>
		Total	\$4,009
Total assets	<u>\$9,154</u>	Total liabilities and equity	<u>\$9,154</u>

Garners' Platoon Mental Health Care, Inc.
Income Statement for Year Ending December 31, 2021
(in millions of dollars)

Net sales (all credit)	\$4,980
Less: Cost of goods sold	<u>2,246</u>
Gross profits	\$2,734
Less: Other operating expenses	<u>125</u>
Earnings before interest, taxes, depreciation, and amortization (EBITDA)	\$2,609
Less: Depreciation	<u>200</u>
Earnings before interest and taxes (EBIT)	\$2,409
Less: Interest	<u>315</u>
Earnings before taxes (EBT)	\$2,094
Less: Taxes	<u>440</u>
Net income	<u>\$1,654</u>
Less: Preferred stock dividends	<u>\$ 60</u>
Net income available to common stockholders	\$1,594
Less: Common stock dividends	<u>722</u>
Addition to retained earnings	\$ 872
Per (common) share data:	
Earnings per share (EPS)	\$ 7.970
Dividends per share (DPS)	\$ 3.610
Book value per share (BVPS)	\$19.745
Market value (price) per share (MVPS)	\$26.850

Garners' Platoon Mental Health Care, Inc.

	<u>Industry</u>
Current ratio	2.00 times
Quick ratio	1.20 times
Cash ratio	0.25 times
Inventory turnover	2.50 times
Days' sales in inventory	146.00 days
Average collection period	91.00 days
Average payment period	100.00 days
Fixed asset turnover	1.25 times
Sales to working capital	4.00 times
Total asset turnover	0.50 times
Capital intensity	2.00 times
Debt ratio	50.00%
Debt-to-equity	1.00 times
Equity multiplier	2.00 times
Times interest earned	7.25 times
Cash coverage	8.00 times
Profit margin	18.75%
Gross profit margin	49.16%
Operating profit margin	42.02%
Basic earnings power	19.90%
ROA	9.38%
ROE	18.75%
Dividend payout	35.00%

Market-to-book ratio	1.30 times
PE ratio	4.10 times

SOLUTION:

Spreading the financial statements

Spread the balance sheet:

Garners' Platoon Mental Health Care, Inc. Balance Sheet as of December 31, 2021 (in millions of dollars)			
Assets		Liabilities and Equity	
Current assets:		Current liabilities:	
Cash and marketable securities	4.60%	Accrued wages and taxes	3.45%
Accounts receivable	12.11	Accounts payable	9.47
Inventory	<u>19.23</u>	Notes payable	<u>9.53</u>
Total	35.94	Total	22.45
Fixed assets:		Long-term debt:	
Gross plant and equipment	63.49		33.76
Less: Depreciation	<u>9.18</u>	Stockholders' equity:	
Net plant and equipment	54.32	Preferred stock (5 million shares)	0.66
Other long-term assets	<u>9.74</u>	Common stock and paid-in surplus (65 million shares)	6.96
Total	64.06	Retained earnings	<u>36.18</u>
		Total	43.80
Total assets	<u>100.00%</u>	Total liabilities and equity	<u>100.00%</u>

Spreading the income statement:

Garners' Platoon Mental Health Care, Inc. Income Statement for Years Ending December 31, 2021 (in millions of dollars)	
Net sales (all credit)	100.00%
Less: Cost of goods sold	<u>45.10</u>
Gross profits	54.90
Less: Other operating expenses	<u>2.51</u>
Earnings before interest, taxes, depreciation, and amortization (EBITDA)	52.39
Less: Depreciation	<u>4.02</u>
Earnings before interest and taxes (EBIT)	48.37
Less: Interest	<u>6.33</u>
Earnings before taxes (EBT)	42.05
Less: Taxes	<u>8.84</u>
Net income	<u>33.21%</u>

<u>Garners' Platoon Mental Health Care, Inc.</u>		<u>Industry</u>
Current ratio	1.60 times	2.00 times
Quick ratio	0.74 times	1.20times
Cash ratio	0.20 times	0.25 times
Inventory turnover	2.83 times	2.50 times
Days' sales in inventory	129.00 days	146.00 days
Average collection period	81.28 days	91.00 days
Average payment period	140.90 days	100.00 days
Fixed asset turnover	1.00 times	1.25 times
Sales to working capital	4.03 times	4.00 times
Total asset turnover	0.544 times	0.50 times
Capital intensity	1.84 times	2.00 times
Debt ratio	56.20%	50.00%
Debt-to-equity	1.28 times	1.00 times
Equity multiplier (common equity)	2.318 times	2.00 times
Times interest earned	7.65 times	7.25 times
Cash coverage	8.28 times	8.00 times
Profit margin	32.01%	18.75%
Gross profit margin	54.90%	49.16%
Operating profit margin	48.37%	42.02%
Basic earnings power	26.32%	19.90%
ROA	17.41%	9.38%
ROE	40.36%	18.75%
Dividend payout	45.29%	48.00%
Market-to-book ratio	1.36 times	1.30 times
PE ratio	3.37 times	3.10 times

The ROA and ROE DuPont equations for Garners' are calculated as follows:

ROA	=	Profit Margin	x	Total asset turnover	
17.41%	=	32.01%	x	0.544 times	
Industry average: 9.375%	=	18.75%	x	0.50 times	
ROE	=	Profit Margin	x	Total asset turnover	x Equity multiplier
40.36%	=	32.01%	x	0.544 times	x 2.318 times
Industry average: 18.75%	=	18.75%	x	0.50 times	x 2.00 times

As we see from these ratios, Garners' Platoon Mental Health Care, Inc. is more profitable than the average firm in the industry when it comes to overall efficiency expressed as ROA and ROE. The DuPont equation highlights that this superior performance comes from both profit margin (operating efficiency) and total asset turnover (efficiency in asset use). Further, the ROE equation highlights that Garner's superior performance is achieved while equity is supporting more dollars of assets relative to the industry. Thus, the firm is using slightly higher levels of debt and lower levels of equity compared to the industry.