

CHAPTER 11

ANALYSIS OF FINANCIAL STATEMENTS

OVERVIEW

Financial statement analysis involves a comparison of a firm's performance with that of other firms in the same line of business. Financial analysis identifies a firm's relative strengths and weaknesses and suggests actions the firm might enact to take advantage of its strengths and correct its weaknesses in the future. Financial statement analysis is not only important for the firm's managers, it also is important for the firm's investors and creditors. Internally, financial managers use the information provided by financial analysis to help make financing and investment decisions to maximize the firm's value. Externally, stockholders and creditors use financial

statement analysis to evaluate the attractiveness of the firm as an investment by examining its ability to meet its current and expected future financial obligations.

Financial statement analysis involves a study of the relationships between income statement and balance sheet accounts, how these relationships change over time (or trend analysis), and how a particular firm compares with other firms in its industry (comparative ratio analysis or benchmarking). Although financial statement analysis has limitations, when used with care and judgment, it can provide some very useful insights into the operations of a company.

OUTLINE

A firm's annual report to shareholders presents two important types of information. The first is a verbal statement of the company's recent operations and its expectations for the coming year. The second is a set of quantitative financial statements that report what actually happened to the firm's financial position, earnings, and dividends over the past few years. The information contained in an annual report is used by investors to form expectations about future earnings and dividends.

- ◆ The *income statement*, often referred to as the profit and loss statement, summarizes the firm's revenues and expenses during the accounting period. *Earnings per share (EPS)* is called "the bottom line," denoting that of all the items on the income statement, EPS is the most important.
 - ◆ It is important to remember that not all of the amounts shown on the income statement represent cash flows. Revenues are recognized when they are earned, not when the cash is received, and expenses are realized when they are incurred, not when the cash is paid.

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- ◆ The *balance sheet* lists the firm's assets and the claims against those assets. It portrays the firm's financial position at a specific point in time.
 - ◆ Assets, found on the left-hand side of the balance sheet, are typically shown in the order of their liquidity, or the length of time it typically takes to convert them to cash. Claims, found on the right-hand side, are generally listed in the order in which they must be paid.
 - ◆ Only cash represents actual money. Noncash assets should produce cash flows eventually, but they do not represent cash in hand, and the amount of cash they would bring if they were sold today could be higher or lower than the values at which they are carried on the books.
 - ◆ Claims against the assets consist of liabilities and *common stockholders' equity*, or *net worth*, a residual representing the amount stockholders would receive if both assets could be sold and liabilities paid at book values. Thus, $\text{Assets} - \text{Liabilities} = \text{Stockholders' equity}$.
 - ◆ The risk of asset value fluctuations is borne by the stockholders.
 - ◆ Most financial analysts combine preferred stock with debt when evaluating a firm's financial position, because the preferred dividend is considered a fixed obligation of the firm.
 - ◆ The common equity section of the balance sheet is divided into three accounts: common stock, paid-in capital, and retained earnings.
 - ◆ *Retained earnings* are built up over time as the firm reinvests a part of its earnings rather than paying all earnings out as dividends.
 - ◆ Common stock and paid-in capital accounts arise from the issuance of stock to raise capital.
 - ◆ The breakdown of the common equity accounts shows whether the company actually earned the funds reported in its equity accounts or whether the funds came mainly from selling stock.
 - ◆ Not every firm uses the same method to determine the account balances shown on the balance sheet. Thus, users of financial statements must be aware that more than one accounting alternative is available for constructing financial statements.
 - ◆ The balance sheet may be thought of as a snapshot of the firm's financial position *at a point in time* (for example, at the end of the year), while the income statement reports on operations *over a period of time* (for example, one calendar year).
- ◆ The *statement of retained earnings* reports changes in the common equity accounts between balance sheet dates.
 - ◆ The balance sheet account "Retained earnings" represents a claim against assets, not assets per se.
 - ◆ Retained earnings as reported on the balance sheet do not represent cash and are not "available" for the payment of dividends or anything else. Retained earnings represent funds that have already been reinvested in operating assets of the firm.

- ◆ In finance the emphasis is on the cash flows that the company is expected to generate. The firm's net income is important, but cash flows are even more important because dividends must be paid in cash, and cash is also necessary to pay the firm's obligations and to purchase the assets required to continue operations.
 - ◆ A firm's *cash flows* include cash receipts and cash disbursements.
 - ◆ Depreciation results because we want to match revenues and expenses to compute a firm's income, not because we want to match cash inflows and cash outflows. Depreciation is a noncash charge used to calculate net income, so if net income is used to obtain an estimate of the net cash flow from operations, depreciation must be added back to net income.
 - ◆ A stock's value is based on the cash flows that investors expect it to provide in the future. The cash flows provided by the stock itself are the expected future dividends stream, and that expected dividends stream provides the fundamental basis for the stock's value.
 - ◆ Because dividends are paid in cash, a company's ability to pay dividends depends on its cash flows, which are generally related to *accounting profit*, or net income reported on the income statement.
 - ◆ The ability to take advantage of growth opportunities often depends on the availability of the cash needed to buy new assets, and the cash flows from existing assets are often the primary source of the funds used to make profitable new investments.
 - ◆ There are two classes of cash flows:
 - ◆ *Operating cash flows* arise from normal operations, and they are the difference between cash collections and cash expenses, including taxes paid.
 - ◆ *Other cash flows* arise from borrowing, from the sale of fixed assets, or from the issuance or repurchase of common stock.
- ◆ The *statement of cash flows* reports the impact of a firm's operating, investing, and financing activities on cash flows over an accounting period.
 - ◆ Net income plus depreciation is the primary operating cash flow.
 - ◆ In order to adjust the estimate of cash flows obtained from the income statement and to account for cash flows not reflected in the income statement, one needs to examine the impact of changes in the balance sheet accounts during the year.
 - ◆ *Sources of cash* include an increase in a liability or equity account or a decrease in an asset account.
 - ◆ *Uses of cash* include a decrease in a liability or equity account or an increase in an asset account.
 - ◆ Each balance sheet change is classified as resulting from operations (those activities associated with the production and sale of goods and services), long-term investments (cash flows arising from the purchase or sale of plant, property, and equipment), or financing activities (cash flows arising from debt and/or common stock).

- ♦ The cash inflows and outflows from these three activities are summed to determine their impact on the firm's liquidity position, which is measured by the change in the cash and marketable securities accounts.

Financial statements are used to help predict a firm's future financial position and to determine expected earnings and dividends. From an investor's standpoint, predicting the future is what financial statement analysis is all about. From management's standpoint, financial statement analysis is useful both as a way to anticipate future conditions and, more importantly, as a starting point for planning actions that will influence the future course of events. An analysis of the firm's ratios is the first step in a financial analysis. Ratios are designed to show relationships between financial statement accounts within firms and between firms.

- ◆ A *liquid asset* can be easily converted to cash without significant loss of its original value. Converting assets, especially current assets such as inventory and receivables, to cash is the primary means by which a firm obtains funds needed to pay its current bills.
 - ◆ Therefore, a firm's "liquid position" deals with the question of how well the firm is able to meet its current obligations.
- ◆ *Liquidity ratios* are used to measure a firm's ability to meet its current obligations as they come due.
 - ◆ The *current ratio* indicates the extent to which the claims of short-term creditors are covered by short-term assets. It is determined by dividing current assets by current liabilities.
 - ♦ The current ratio is the most commonly used measure of short-term solvency.
 - ◆ The *quick*, or *acid test*, *ratio* is calculated by deducting inventories from current assets and then dividing the remainder by current liabilities.
 - ♦ Inventories are excluded because it may be difficult to liquidate them at their full book value.
 - ♦ The quick ratio is a variation of the current ratio.
- ◆ *Asset management ratios* measure how effectively a firm is managing its assets and whether or not the level of those assets is properly related to the level of operations as measured by sales.
 - ◆ The *inventory turnover ratio* is defined as cost of goods sold divided by inventories. It is often necessary to use the average inventory figure rather than the year-end figure, especially if a firm's business is highly seasonal or if there has been a strong upward or downward sales trend during the year.
 - ◆ The *days sales outstanding (DSO)* is used to evaluate the firm's ability to collect its credit sales in a timely manner. It is calculated by dividing average daily sales into accounts receivable to find the number of days' sales tied up in receivables. Thus, the DSO represents the average length of time that the firm must wait after making a sale before receiving cash, which is the average collection period.

- ♦ The DSO can also be evaluated by comparison with the terms on which the firm sells its goods.
- ◆ The *fixed assets turnover ratio* is the ratio of sales to net fixed assets. It measures how effectively the firm uses its plant and equipment to generate sales.
- ◆ The *total assets turnover ratio* is calculated by dividing sales by total assets. It measures the turnover of all the firm's assets.
- ◆ *Debt management ratios* measure the extent to which a firm is using debt financing, or *financial leverage*, and the degree of safety afforded to creditors. Decisions about the use of debt require firms to balance higher expected returns against increased risk.
 - ◆ The *debt ratio*, or ratio of total debt to total assets, measures the percentage of the firm's assets financed by creditors.
 - ♦ The lower the ratio, the greater the protection afforded creditors in the event of liquidation.
 - ♦ The owners can benefit from leverage because it magnifies earnings, thus the return to stockholders. Too much debt often leads to financial difficulty, which eventually might cause bankruptcy.
 - ◆ The *times-interest-earned (TIE) ratio* is determined by dividing earnings before interest and taxes (EBIT) by interest charges. The TIE measures the extent to which operating income can decline before the firm is unable to meet its annual interest costs.
 - ♦ Failure to meet its interest obligation can bring legal action by the firm's creditors, possibly resulting in bankruptcy.
 - ♦ EBIT is used in the numerator. Because interest is paid with pretax dollars, the firm's ability to pay current interest is not affected by taxes.
 - ◆ The *fixed charge coverage ratio* is similar to the TIE ratio, but it is more inclusive because it recognizes that many firms lease assets and have debt sinking fund payments.
 - ♦ In the numerator of the fixed charge coverage ratio, the lease payments are added to EBIT because we want to determine the firm's ability to cover its fixed charges from the income generated before any fixed charges are deducted.
- ◆ Profitability is the net result of a number of policies and decisions. *Profitability ratios* show the combined effects of liquidity, asset management, and debt management on operating results.
 - ◆ The *net profit margin on sales* is calculated by dividing net income by sales, and it gives the profit per dollar of sales.
 - ♦ The operating profit margin is the ratio of EBIT (operating income) to sales.
 - ◆ The *return on total assets (ROA)* is the ratio of net income to total assets; it provides an idea of the overall return on investments earned by the firm.
 - ◆ The *return on common equity (ROE)* measures the rate of return on common stockholders' investment. It is equal to net income divided by common equity.

- ◆ *Market value ratios* relate the firm's stock price to its earnings and book value per share, and thus give management an indication of what investors think of the company's past performance and future prospects. If the firm's liquidity, asset management, debt management, and profitability ratios are all good, then its market value ratios will be high, and its stock price will probably be as high as can be expected.
 - ◆ The *price/earnings (P/E) ratio*, or market price per share divided by earnings per share, shows how much investors are willing to pay per dollar of reported profits. Other things held constant, P/E ratios are higher for firms with high growth prospects, but they are lower for riskier firms.
 - ◆ The *market/book (M/B) ratio*, defined as market price per share divided by book value per share, gives another indication of how investors regard the company. Higher M/B ratios are generally associated with firms that have a high rate of return on common equity.

It is important to analyze trends in ratios as well as their absolute levels. Trend analysis can provide clues as to whether the firm's financial situation is improving or deteriorating relative to past performance.

- ◆ A simple approach to trend analysis is to construct graphs containing both the firm's ratios and the industry averages for the past 5 years. Using this approach, we can examine both the direction of the movement in, and the relationships between, the firm's ratios and the industry averages.

A modified Du Pont chart shows the relationships among return on investment, assets turnover, net profit margin, and leverage.

- ◆ The left side of the chart develops the profit margin on sales. The right side lists the various categories of assets, totals them, and then divides sales by total assets to find the total assets turnover ratio.
- ◆ Net profit margin times total assets turnover is called the *Du Pont equation*. This equation gives the rate of return on assets (ROA): $ROA = \text{Net profit margin} \times \text{Total assets turnover}$.
- ◆ The *extended Du Pont equation* uses the relationship between ROA and ROE to derive: $ROE = \text{Net profit margin} \times \text{Total assets turnover} \times \text{Equity multiplier}$.
- ◆ The firm can use the Du Pont system to analyze ways of improving the firm's performance.

Comparative ratio analysis (benchmarking) is useful in comparing a firm's ratios with those of other firms in the same industry. Sources for such ratios include Dun & Bradstreet, Robert Morris Associates, the U.S. Commerce Department, and trade associations.

- ◆ When you select a comparative data source, you should be sure that your emphasis is similar to that of the agency whose ratios you plan to use.
- ◆ Additionally, there are often definitional differences in the ratios presented by different sources, so before using a source, be sure to verify the exact definitions of the ratios to ensure consistency with your work.

There are some inherent problems and limitations to ratio analysis that necessitate care and judgment.

- ◆ Ratios are often not useful for analyzing the operations of large firms that operate in many different industries because comparative ratios are not meaningful.
- ◆ The use of industry averages may not provide a very challenging target for high-level performance.
- ◆ Inflation might distort firms' balance sheets. For this reason, the analysis of a firm over time, or a comparative analysis of firms of different ages, can be misleading.
- ◆ Ratios may be distorted by seasonal factors, or manipulated by management to give the impression of a sound financial condition ("window dressing").
- ◆ Different accounting practices can distort comparisons.
- ◆ Many ratios can be interpreted in different ways, and whether a particular ratio is good or bad should be based upon a complete financial statement analysis rather than the level of a single ratio at a single point in time.

SELF-TEST QUESTIONS

Definitional

1. Of all its communications with shareholders, a firm's _____ report is generally the most important.
2. The income statement reports the results of operations during the past year, the most important item being _____.
3. The _____ lists the firm's assets as well as claims against those assets.
4. Typically, assets are listed in order of their _____, while liabilities are listed in the order in which they must be paid.

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5. Assets – Liabilities = _____ worth, or _____ equity.
6. The three accounts that normally make up the common equity section of the balance sheet are common stock, _____ - _____ capital, and _____.
7. _____ as reported on the balance sheet represent income earned by the firm in past years that has not been paid out as dividends.
8. Retained earnings are generally reinvested in _____ and are not held in the form of cash.
9. In finance the emphasis is on the _____ that the company is expected to generate.
10. Depreciation is a(n) _____ charge used to calculate net income, so if net income is used to obtain an estimate of the net cash flow from operations, depreciation must be added back to net income.
11. _____ arise from normal operations, and they are the difference between cash collections and cash expenses, including taxes paid.
12. The statement of cash flows reports the impact of a firm's _____, _____, and _____ activities on cash flows over an accounting period.
13. The current and acid-test ratios are examples of _____ ratios. They measure a firm's ability to meet its _____ obligations as they come due.
14. The days sales outstanding (DSO) ratio is found by dividing average sales per day into accounts _____. The DSO is the length of time that a firm must wait after making a sale before it receives _____, which is the _____.
15. Debt management ratios are used to evaluate a firm's use of financial _____.
16. The debt ratio, which is the ratio of total _____ to total _____, measures the percentage of the firm's assets financed by creditors. The _____ the ratio, the greater the protection afforded creditors in the event of liquidation.
17. The _____ - _____ - _____ ratio, calculated by dividing earnings before interest and taxes by the amount of interest charges, measures the extent to which operating income can decline before the firm is unable to meet its annual interest costs.
18. The combined effects of liquidity, asset management, and debt management on operating

results are measured by _____ ratios.

19. Dividing net income by sales gives the _____ on sales.
20. The _____ provides an idea of the overall return on investments earned by the firm.
21. The _____ measures the rate of return on common stockholders' investment.
22. The _____/_____ ratio measures how much investors are willing to pay for each dollar of a firm's current income.
23. Firms with higher rates of return on stockholders' equity tend to sell at relatively high ratios of _____ price to _____ value.
24. Individual ratios are of little value in analyzing a company's financial condition. More important are the _____ of a ratio over time and the comparison of the company's ratios to _____ average ratios.
25. A modified _____ chart shows the relationships among return on investment, assets turnover, net profit margin, and leverage.
26. Return on assets is a function of two variables, _____ and _____ turnover.
27. Analyzing a particular ratio over time for an individual firm is known as _____ analysis.

Conceptual

38. A high quick ratio is always a good indication of a well-managed liquidity position.
 - a. True
 - b. False
39. The fact that 70 percent of intercorporate dividends received by a corporation is excluded from taxable income has encouraged debt financing over equity financing.
 - a. True
 - b. False
40. International Appliances Inc. has a current ratio of 0.5. Which of the following actions would improve (increase) this ratio?

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- a. Use cash to pay off current liabilities.
 - b. Collect some of the current accounts receivable.
 - c. Use cash to pay off some long-term debt.
 - d. Purchase additional inventory on credit (accounts payable).
 - e. Sell some of the existing inventory at cost.
- 41. Refer to Self-Test Question 40. Assume that International Appliances has a current ratio of 1.2. Now, which of the following actions would improve (increase) this ratio?
 - a. Use cash to pay off current liabilities.
 - b. Collect some of the current accounts receivable.
 - c. Use cash to pay off some long-term debt.
 - d. Purchase additional inventory on credit (accounts payable).
 - e. Use cash to pay for some fixed assets.
- 42. Examining the ratios of a particular firm against the same measures for a group of firms from the same industry, at a point in time, is an example of
 - a. Trend analysis.
 - b. Comparative ratio analysis.
 - c. Du Pont analysis.
 - d. Simple ratio analysis.
 - e. Industry analysis.

- 43.** Which of the following statements is correct?
- a.** Having a high current ratio and a high quick ratio is always a good indication that a firm is managing its liquidity position well.
 - b.** A decline in the inventory turnover ratio suggests that the firm's liquidity position is improving.
 - c.** If a firm's times-interest-earned ratio is relatively high, then this is one indication that the firm should be able to meet its debt obligations.
 - d.** Since ROA measures the firm's effective utilization of assets (without considering how these assets are financed), two firms with the same EBIT must have the same ROA.
 - e.** If, through specific managerial actions, a firm has been able to increase its ROA, then, because of the fixed mathematical relationship between ROA and ROE, it must also have increased its ROE.
- 44.** Which of the following statements is correct?
- a.** Suppose two firms with the same amount of assets pay the same interest rate on their debt and earn the same rates of return on their assets and that their ROAs are positive. However, one firm has a higher debt ratio. Under these conditions, the firm with the higher debt ratio will also have a higher rate of return on common equity.
 - b.** One of the problems of ratio analysis is that the relationships are subject to manipulation. For example, we know that if we use some cash to pay off some of our current liabilities, the current ratio will always increase, especially if the current ratio is weak initially, for example, below 1.0.
 - c.** Generally, firms with high net profit margins have high asset turnover ratios and firms with low net profit margins have low turnover ratios; this result is exactly as predicted by the extended Du Pont equation.
 - d.** Firms A and B have identical earnings and identical dividend payout ratios. If Firm A's growth rate is higher than Firm B's, then Firm A's P/E ratio must be greater than Firm B's P/E ratio.
 - e.** Each of the above statements is false.
- 45.** An individual with substantial personal wealth and income is considering the possibility of opening a new business. The business will have a relatively high degree of risk, and losses may be incurred for the first several years. Which legal form of business organization would probably be best?
- a.** Proprietorship
 - b.** Corporation
 - c.** Partnership
 - d.** S corporation
 - e.** Limited partnership

SELF-TEST PROBLEMS

(The following financial statements apply to the next six problems.)

Roberts Manufacturing Balance Sheet
December 31, 2005
(Dollars in Thousands)

Cash	\$ 200	Accounts payable	\$ 205
Receivables	245	Notes payable	425
Inventory	<u>625</u>	Other current liabilities	<u>115</u>
Total current assets	\$1,070	Total current liabilities	\$ 745
Net fixed assets	1,200	Long-term debt	420
		Common equity	<u>1,105</u>
Total assets	<u>\$2,270</u>	Total liabilities and equity	<u>\$2,270</u>

Roberts Manufacturing
Income Statement for Year Ended December 31, 2005
(Dollars in Thousands)

Sales		\$2,400
Cost of goods sold:		
Materials	\$1,000	
Labor	600	
Heat, light, and power	89	
Indirect labor	65	
Depreciation	<u>80</u>	<u>1,834</u>
Gross profit		\$ 566
Selling expenses		175
General and administrative expenses		<u>216</u>
Earnings before interest and taxes (EBIT)		\$ 175
Less interest expense		<u>35</u>
Earnings before taxes (EBT)		\$ 140
Less taxes (40%)		<u>56</u>
Net income (NI)		<u>\$ 84</u>

1. Calculate the liquidity ratios, that is, the current ratio and the quick ratio.
 - a. 1.20; 0.60 b. 1.20; 0.80 c. 1.44; 0.60 d. 1.44; 0.80 e. 1.60; 0.60

2. Calculate the asset management ratios, that is, the inventory turnover ratio, fixed assets turnover, total assets turnover, and days sales outstanding.
 - a. 2.93; 2.00; 1.06; 36.75 days d. 2.93; 2.00; 1.24; 34.10 days
 - b. 2.93; 2.00; 1.06; 35.25 days e. 2.93; 2.20; 1.48; 34.10 days
 - c. 2.93; 2.00; 1.06; 34.10 days

3. Calculate the debt management ratios, that is, the debt and times-interest-earned ratios.
 - a. 0.39; 3.16 b. 0.39; 5.00 c. 0.51; 3.16 d. 0.51; 5.00 e. 0.73; 3.16

4. Calculate the profitability ratios, that is, the net profit margin on sales, return on total assets, and return on common equity.
 - a. 3.50%; 4.25%; 7.60% d. 3.70%; 3.50%; 8.00%
 - b. 3.50%; 3.70%; 7.60% e. 4.25%; 3.70%; 7.60%
 - c. 3.70%; 3.50%; 7.60%

5. Calculate the market value ratios, that is, the price/earnings ratio and the market/book value ratio. Roberts had an average of 10,000 shares outstanding during 2005, and the stock price on December 31, 2005, was \$40.00.
 - a. 4.21; 0.36 b. 3.20; 1.54 c. 3.20; 0.36 d. 4.76; 1.54 e. 4.76; 0.36

6. Use the Du Pont equation to determine Roberts' return on assets.
 - a. 7.6% b. 7.9% c. 6.2% d. 3.7% e. 4.5%

7. Lewis Inc. has sales of \$2 million per year, all of which are credit sales. Its days sales outstanding is 42 days. What is its average accounts receivable balance?
 - a. \$233,333 b. \$266,667 c. \$333,333 d. \$350,000 e. \$366,667

8. Southeast Jewelers Inc. sells only on credit. Its days sales outstanding is 60 days, and its average accounts receivable balance is \$500,000. What are its sales for the year?
 - a. \$1,500,000 b. \$3,000,000 c. \$2,000,000 d. 2,750,000 e. \$3,225,000

9. A firm has total interest charges of \$20,000 per year, sales of \$2 million, a tax rate of 40 percent, and a net profit margin of 6 percent. What is the firm's times-interest-earned ratio?

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- a. 10 b. 11 c. 12 d. 13 e. 14
- 10.** Refer to Self-Test Problem 9. What is the firm's TIE, if its net profit margin decreases to 3 percent and its interest charges double to \$40,000 per year?
- a. 3.0 b. 2.5 c. 3.5 d. 4.2 e. 3.7
- 11.** A fire has destroyed many of the financial records at Anderson Associates. You are assigned to piece together information to prepare a financial report. You have found that the firm's return on equity is 12 percent and its debt ratio is 0.40. What is its return on assets?
- a. 4.90% b. 5.35% c. 6.60% d. 7.20% e. 8.40%
- 12.** Rowe and Company has a debt ratio of 0.50, a total assets turnover of 0.25, and a net profit margin of 10 percent. The president is unhappy with the current return on assets, and he thinks it could be doubled. This could be accomplished (1) by increasing the net profit margin to 14 percent and (2) by increasing asset utilization (turnover). What new total assets turnover ratio, along with the 14 percent net profit margin, is required to double the return on assets?
- a. 0.50 b. 0.18 c. 0.36 d. 0.70 e. 0.62
- 13.** Altman Corporation has \$1,000,000 of debt outstanding, and it pays an interest rate of 12 percent annually. Altman's annual sales are \$4 million, its marginal tax rate is 25 percent, and its net profit margin on sales is 10 percent. If the company does not maintain a TIE ratio of at least 5 times, its bank will refuse to renew the loan, and bankruptcy will result. What is Altman's TIE ratio?
- a. 3.33 b. 4.44 c. 2.50 d. 4.00 e. 5.44
- 14.** Refer to Self-Test Problem 13. What is the maximum amount Altman's EBIT could decrease and its bank still renew its loan?
- a. \$53,333 b. \$45,432 c. \$66,767 d. \$47,898 e. \$57,769
- 15.** Pinkerton Packaging's ROE last year was 2.5 percent, but its management has developed a new operating plan designed to improve things. The new plan calls for a total debt ratio of 50 percent, which will result in interest charges of \$240 per year. Management projects an EBIT of \$800 on sales of \$8,000, and it expects to have a total assets turnover ratio of 1.6. Under these conditions, the marginal tax rate will be 40 percent. If the changes are made, what return on assets will Pinkerton earn?

- a. 6.25% b. 6.72% c. 6.50% d. 7.01% e. 7.28%

(The following financial statements apply to the next three problems.)

**Baker Corporation Balance Sheet
December 31, 2005**

Cash and marketable securities	\$ 50	Accounts payable	\$ 250
Accounts receivable	200	Accruals	250
Inventory	<u>250</u>	Notes payable	<u>500</u>
Total current assets	\$ 500	Total current liabilities	\$1,000
Net fixed assets	1,500	Long-term debt	250
		Common stock	400
		Retained earnings	<u>350</u>
Total assets	<u>\$2,000</u>	Total liabilities and equity	<u>\$2,000</u>

16. What is Baker Corporation's current ratio as of December 31, 2005?
- a. 0.35 b. 0.65 c. 0.50 d. 0.25 e. 0.75
17. If Baker uses \$50 of cash to pay off \$50 of its accounts payable, what is its new current ratio after this action?
- a. 0.47 b. 0.44 c. 0.54 d. 0.33 e. 0.62
18. If Baker uses its \$50 cash balance to pay off \$50 of its long-term debt, what will be its new current ratio?
- a. 0.35 b. 0.50 c. 0.55 d. 0.60 e. 0.45

(The following financial statements apply to the next problem.)

**Whitney Inc. Balance Sheet
December 31, 2005**

		Total current liabilities	\$100
		Long-term debt	250
		Common stockholders' equity	<u>400</u>
Total assets	<u>\$750</u>	Total liabilities and equity	<u>\$750</u>

**Whitney Inc. Income Statement
for Year Ended December 31, 2005**

Sales		\$1,000
Cost of goods sold (excluding depreciation)	\$550	
Other operating expenses	100	
Depreciation	<u>50</u>	
Total operating costs		<u>700</u>
Earnings before interest and taxes (EBIT)		\$ 300
Less interest expense		<u>25</u>
Earnings before taxes (EBT)		\$ 275
Less taxes (40%)		<u>110</u>
Net income		<u>\$ 165</u>

19. What is Whitney Inc.'s ROA?

- a. 35% b. 30% c. 15% d. 22% e. 40%

(The following financial statements apply to the next problem.)

**Cotner Enterprises Balance Sheet
December 31, 2005**

		Total current liabilities	\$ 300
		Long-term debt	500
		Common stockholders' equity	<u>450</u>
Total assets	<u>\$1,250</u>	Total liabilities and equity	<u>\$1,250</u>

**Cotner Enterprises Income Statement
for Year Ended December 31, 2005**

Sales		\$1,700
Cost of goods sold (excluding depreciation)	\$1,190	
Other operating expenses	135	
Depreciation	<u>75</u>	
Total operating costs		<u>1,400</u>
Earnings before interest and taxes (EBIT)		\$ 300
Less interest expense		<u>54</u>
Earnings before taxes (EBT)		\$ 246
Less taxes (34%)		<u>84</u>
Net income		<u>\$ 162</u>

20. What is Cotner Enterprise's ROA?

- a. 9.85% b. 12.96% c. 15.75% d. 17.50% e. 20.50%

21. Dauten Enterprises is just being formed. It will need \$2 million of assets, and it expects to have an EBIT of \$400,000. Dauten will own no securities, so all of its income will be operating income. If it chooses to, Dauten can finance up to 50 percent of its assets with debt that will have a 9 percent interest rate. Dauten has no other liabilities. Assuming a 40 percent marginal tax rate on all taxable income, what is the difference between the expected ROE if Dauten finances with 50 percent debt versus the expected ROE if it finances entirely with common stock?

- a. 7.2% b. 6.6% c. 6.0% d. 5.8% e. 9.0%

(The following balance sheets apply to the next two problems.)

American Products Corporation
Balance Sheets
(Dollars in Millions)

	December 31, 2005	December 31, 2004
Cash	\$ 42	\$ 90
Marketable securities	0	66
Net receivables	180	132
Inventory	450	318
Total current assets	\$ 672	\$606
Gross fixed assets	900	450
Less accumulated depreciation	(246)	(156)
Net fixed assets	654	294
Total assets	<u>\$1,326</u>	<u>\$900</u>
Accounts payable	\$ 108	\$ 90
Notes payable	18	90
Other current liabilities	90	42
Long-term debt	156	48
Common stock	384	228
Retained earnings	570	402
Total liabilities and equity	<u>\$1,326</u>	<u>\$900</u>

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- During 2005, the company earned \$228 million after taxes, of which \$60 million were paid out as dividends.
22. Looking only at the balance sheet accounts, what are the total sources of funds (that must equal the total uses of funds) for 2005 (dollars in millions)?
- a. \$426 b. \$572 c. \$702 d. \$856 e. \$1,061
23. What are the cash flows from operations (in millions of dollars) for 2005?
- a. -\$246 b. \$204 c. \$246 d. -\$114 e. -\$204

ANSWERS TO SELF-TEST QUESTIONS

- | | |
|---|-------------------------------------|
| 1. annual | 15. leverage |
| 2. earnings per share | 16. debt; assets; lower |
| 3. balance sheet | 17. times-interest-earned |
| 4. liquidity | 18. profitability |
| 5. Net; Stockholders' | 19. net profit margin |
| 6. paid-in; retained earnings | 20. return on total assets |
| 7. Retained earnings | 21. return on common equity |
| 8. operating assets | 22. price/earnings |
| 9. cash flows | 23. market; book |
| 10. noncash | 24. trend; industry |
| 11. Operating cash flows | 25. Du Pont |
| 12. operating; investing; financing | 26. net profit margin; total assets |
| 13. liquidity; current | 27. trend |
| 14. receivable; cash; average collection period | |

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38. b. Excess cash resulting from poor management could produce a high quick ratio. Similarly, if accounts receivable are not collected promptly, this could also lead to a high quick ratio.
39. b. Debt financing is encouraged by the fact that interest payments are tax deductible, while dividend payments are not.
40. d. This question is best analyzed using numbers. For example, assume current assets equal \$50 and current liabilities equal \$100; thus, the current ratio equals 0.5. For answer a, assume \$5 in cash is used to pay off \$5 in current liabilities. The new current ratio would be $\$45/\$95 = 0.47$. For answer d, assume a \$10 purchase of inventory on credit (accounts payable). The new current ratio would be $\$60/\$110 = 0.55$, which is an increase over the old current ratio of 0.5. (Self-Test Problems 16 through 18 were set up to help visualize this question.)
41. a. Again, this question is best analyzed using numbers. For example, assume current assets equal \$120 and current liabilities equal \$100; thus, the current ratio equals 1.2. For answer a, assume \$5 in cash is used to pay off \$5 in current liabilities. The new current ratio would be $\$115/\$95 = 1.21$, which is an increase over the old current ratio of 1.2. For answer d, assume a \$10 purchase of inventory on credit (accounts payable). The new current ratio would be $\$130/\$110 = 1.18$, which is a decrease over the old current ratio of 1.2.
42. b. The correct answer is comparative ratio analysis. A trend analysis compares the firm's ratios over time, while a Du Pont analysis shows the relationships among return on investment, assets turnover, net profit margin, and leverage.
43. c. Excess cash resulting from poor management could produce high current and quick ratios; thus statement a is false. A decline in the inventory turnover ratio suggests that either sales have decreased or inventory has increased—which suggests that the firm's liquidity position is not improving; thus statement b is false. $ROA = \text{Net income}/\text{Total assets}$, and EBIT does not equal net income. Two firms with the same EBIT could have different financing and different taxes resulting in different net incomes. Also, two firms with the same EBIT do not necessarily have the same total assets; thus statement d is false. $ROE = ROA \times \text{Assets}/\text{Equity}$. If ROA increases because total assets decrease, then the equity multiplier decreases, and depending on which effect is greater, ROE may or may not increase; thus statement e is false. Statement c is correct; the TIE ratio is used to measure whether the firm can meet its debt obligations, and a high TIE ratio would indicate this is so. (Self-Test Problems 19 and 20 were set up to help visualize statement d of this question.)
44. a. Ratio analysis is subject to manipulation; however, if the current ratio is less than 1.0 and we use cash to pay off some current liabilities, the current ratio will decrease, not

increase; thus statement b is false. Statement c is just the reverse of what actually occurs. Firms with high net profit margins have low turnover ratios and vice versa. Statement d is false; it does not necessarily follow that if a firm's growth rate is higher that its stock price will be higher. Statement a is correct. From the information given in statement a, one can determine that the two firms' net incomes are equal; thus, the firm with the higher debt ratio (lower equity ratio) will indeed have a higher ROE.

SOLUTIONS TO SELF-TEST PROBLEMS

$$1. \quad c. \quad \text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}} = \frac{\$1,070}{\$745} = 1.44\times.$$

$$\text{Quick ratio} = \frac{\text{Current assets} - \text{Inventory}}{\text{Current liabilities}} = \frac{\$1,070 - \$625}{\$745} = 0.60\times.$$

$$2. \quad a. \quad \text{Inventory turnover} = \frac{\text{Cost of goods sold}}{\text{Inventory}} = \frac{\$1,834}{\$625} = 2.93\times.$$

$$\text{Fixed assets turnover} = \frac{\text{Sales}}{\text{Net fixed assets}} = \frac{\$2,400}{\$1,200} = 2.00\times.$$

$$\text{Total assets turnover} = \frac{\text{Sales}}{\text{Total assets}} = \frac{\$2,400}{\$2,270} = 1.06\times.$$

$$\text{DSO} = \frac{\text{Accounts receivable}}{\text{Sales}/360} = \frac{\$245}{\$2,400/360} = 36.75 \text{ days}.$$

$$3. \quad d. \quad \text{Debt ratio} = \frac{\text{Total debt}}{\text{Total assets}} = \frac{\$1,165}{\$2,270} = 0.51 = 51\%.$$

$$\text{TIE ratio} = \frac{\text{EBIT}}{\text{Interest}} = \frac{\$175}{\$35} = 5.00\times.$$

$$4. \quad b. \quad \text{Net profit margin} = \frac{\text{Net income}}{\text{Sales}} = \frac{\$84}{\$2,400} = 0.0350 = 3.50\%.$$

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$$ROA = \frac{\text{Net income}}{\text{Total assets}} = \frac{\$84}{\$2,270} = 0.0370 = 3.70\%.$$

$$ROE = \frac{\text{Net income}}{\text{Common equity}} = \frac{\$84}{\$1,105} = 0.760 = 7.60\%.$$

5. e. $EPS = \frac{\text{Net income}}{\text{Number shares outstanding}} = \frac{\$84,000}{10,000} = \$8.40.$

$$P/E \text{ ratio} = \frac{\text{Price}}{EPS} = \frac{\$40.00}{\$8.40} = 4.76.$$

$$\text{Market/book value} = \frac{\text{Market price}}{\text{Book value}} = \frac{\$40(10,000)}{\$1,105,000} = 0.36.$$

6. d. $ROA = \text{Net profit margin} \times \text{Total assets turnover}$
 $= \frac{\$84}{\$2,400} \times \frac{\$2,400}{\$2,270} = 0.035 \times 1.057 = 0.037 = 3.7\%.$

7. a. $DSO = \frac{\text{Accounts receivable}}{\text{Sales}/360}$
 $42 \text{ days} = \frac{AR}{\$2,000,000/360}$
 $AR = \$233,333.$

8. b. $DSO = \text{Accounts receivable}/(\text{Sales}/360)$
 $60 \text{ days} = \$500,000/(\text{Sales}/360)$
 $60(\text{Sales}/360) = \$500,000$
 $\text{Sales} = \$3,000,000.$

9. b. $\text{Net income} = \$2,000,000(0.06) = \$120,000.$

$$\text{Earnings before taxes} = \$120,000/(1 - 0.4) = \$200,000.$$

$$EBIT = \$200,000 + \$20,000 = \$220,000.$$

- TIE = EBIT/Interest = $\$220,000/\$20,000 = 11\times$.
- 10.** c. Net income = $\$2,000,000(0.03) = \$60,000$.
- Earnings before taxes = $\$60,000/(1 - 0.4) = \$100,000$.
- EBIT = $\$100,000 + \$40,000 = \$140,000$.
- TIE = EBIT/Interest = $\$140,000/\$40,000 = 3.5\times$.
- 11.** d. ROE = NI/Equity = 0.12. Total debt/Total assets = 0.40,
so Total equity/Total assets = 0.60, and Total equity = 0.60(Total assets).
- NI/[0.60(TA)] = 0.12.
- NI = (0.6)(0.12)(TA) = 0.072(TA).
- ROA = NI/TA = [0.072(TA)]/TA = 0.072 = 7.2%.
- 12.** c. If Total debt/Total assets = 0.50, then Total equity/Total assets = 0.50.
- ROA = Net profit margin \times Total assets turnover.
- Before: ROA = $10\% \times 0.25 = 2.5\%$.
- After:
- $$\begin{aligned} 5.0\% &= 14\% \times \text{Total assets turnover} \\ \text{Total assets turnover} &= \frac{5.0\%}{14\%} = 0.36\times. \end{aligned}$$
- 13.** e. TIE = EBIT/Interest, so find EBIT and Interest.
- Interest = $\$1,000,000(0.12) = \$120,000$.
- Net income = $\$4,000,000(0.10) = \$400,000$.
- Taxable income = EBT = $\$400,000/(1 - T) = \$400,000/(0.75) = \$533,333$.
- EBIT = $\$533,333 + \$120,000 = \$653,333$.
- TIE = $\$653,333/\$120,000 = 5.44\times$.

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14. a. $TIE = EBIT/INT$
 $5 = EBIT/\$120,000$
 $EBIT = \$600,000.$

From Self-Test Problem 13, $EBIT = \$653,333$, so EBIT could decrease by $\$653,333 - \$600,000 = \$53,333$.

15. b. $ROE = \text{Net profit margin} \times \text{Total assets turnover} \times \text{Equity multiplier}$
 $= NI/Sales \times Sales/TA \times TA/Equity.$

Now we need to determine the inputs for the equation from the data that were given. On the left we set up an income statement, and we put numbers in it on the right:

Sales (given)	\$8,000
– Cost	<u>NA</u>
EBIT (given)	\$ 800
– Interest (given)	<u>240</u>
EBT	\$ 560
– Taxes (40%)	<u>224</u>
Net income	<u>\$ 336</u>

Now we can use some ratios to get some more data:

Total assets turnover = $1.6 = S/TA$.

$D/A = 50\%$.

Now we can complete the Du Pont equation to determine ROA:

$ROA = \$336/\$8,000 \times 1.6 = 4.2\% \times 1.6 = 6.72\%$.

16. c. Baker Corporation's current ratio equals $\text{Total current assets}/\text{Total current liabilities} = \$500/\$1,000 = 0.50$.
17. a. Baker Corporation's new current ratio equals $(\$500 - \$50)/(\$1,000 - \$50) = \$450/\$950 = 0.47$.
18. e. Only the current assets balance is affected by this action. Baker's new current ratio = $(\$500 - \$50)/\$1,000 = \$450/\$1,000 = 0.45$.
19. d. Whitney's ROA equals $\text{Net income}/\text{Total assets} = \$165/\$750 = 22\%$.

20. b. Cotner's ROA equals Net income/Total assets = \$162/\$1,250 = 12.96%.

21. b. Known data: Total assets = \$2,000,000, EBIT = \$400,000, $k_d = 9\%$, $T = 40\%$.

	<u>D/A = 0%</u>	<u>D/A = 50%</u>
EBIT	\$400,000	\$400,000
Interest	<u>0</u>	<u>90,000*</u>
Taxable income	\$400,000	\$310,000
Taxes (40%)	<u>160,000</u>	<u>124,000</u>
Net income (NI)	<u>\$240,000</u>	<u>\$186,000</u>

*If $D/A = 50\%$, then half of the assets are financed by debt, so Debt = $0.5(\$2,000,000) = \$1,000,000$. At a 9 percent interest rate, $INT = 0.09(\$1,000,000) = \$90,000$.

For $D/A = 0\%$, $ROE = NI/Equity = \$240,000/\$2,000,000 = 12\%$. For $D/A = 50\%$, $ROE = \$186,000/\$1,000,000 = 18.6\%$. Difference = $18.6\% - 12.0\% = 6.6\%$.

22. c. Total sources and uses of funds = \$702 million.

(In millions)	<u>Change</u>	
	<u>Sources</u>	<u>Uses</u>
Cash	\$ 48	
Marketable securities	66	
Net receivables		\$ 48
Inventories		132
Gross fixed assets		450
Accumulated depreciation	90	
Accounts payable	18	
Notes payable		72
Other current liabilities	48	
Long-term debt	108	
Common stock	156	
Retained earnings	<u>168</u>	
	<u>\$702</u>	<u>\$702</u>

Note that accumulated depreciation is a contra-asset account, and an increase in this account is a source of funds. Also note that no total lines such as total current assets can be used to determine sources and uses since to do so would be to "double count."

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23. b. Cash flows from operations (in millions of dollars):

Operating activities:	
Net income	\$228
Other additions (sources of cash):	
Depreciation	90
Increase in accounts payable	18
Increase in other current liabilities	48
Subtractions (uses of cash):	
Increase in accounts receivable	(48)
Increase in inventories	<u>(132)</u>
Net cash flows from operations	<u>\$204</u>