

# Introduction to Financial Statement Analysis

1. Understand the relation between the expected return and risk of investment alternatives and the role financial statement analysis plays in providing information about returns and risk.
2. Understand the need to recognize the scale of operations in analyzing performance. Scale is incorporated by the use of ratios.
3. Understand the usefulness of return on equity (ROE) and return on assets (ROA) as measures of profitability, and the relation between these two measures.
4. Understand the insights gained by disaggregating ROE using the DuPont Decomposition Analysis.
5. Understand the distinction between short-term liquidity risk and long-term liquidity risk and the financial ratios used to assess each.
6. Develop skills to compare performance both over-time and across-firms.
7. (Appendix) Develop skills to prepare pro forma financial statements.

## LEARNING OBJECTIVES

**Chapter 1** introduced you to the financial statements of Great Deal, Inc. As shown in **Exhibit 1.2**, Great Deal earned \$1,317 million in fiscal 2012, \$1,003 million in fiscal 2011, and \$1,407 million in 2010. **Exhibit 1.1** shows that Great Deal's total assets increased over the same period: from \$12,758 million in 2010, to \$15,826 million in 2011, to \$18,302 million in 2012.

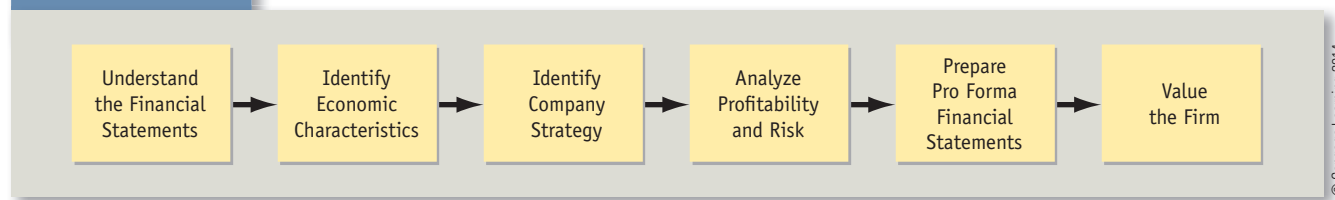
These financial data do not indicate whether Great Deal is performing well or poorly. Specifically, neither the balance sheet alone nor the income statement alone provides sufficient information to answer the following questions about Great Deal's performance and risk:

- How does Great Deal's recent profitability compare to its prior profitability, and to its competitors' profitability?
- What is the source of Great Deal's profitability? Does it derive from selling products and services at substantially higher prices than it costs to obtain those products and services? Or does it derive from selling large volumes of products and services? Or from a combination of the two?
- What risks does Great Deal face? For example, is Great Deal able to pay its debts as they come due?

Answering these questions requires analysis of Great Deal's financial statements and related information provided in the notes to the financial statements. This chapter introduces the tools and techniques of financial statement analysis. **Figure 7.1** presents the typical steps in financial statement analysis and valuation.

FIGURE 7.1

## Overview of Financial Statement Analysis



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1. **Understand the purpose and content of three principal financial statements and related notes.** Our financial statement analysis considers the balance sheet, income statement, and statement of cash flows, discussed in **Chapters 4, 5, and 6**, respectively.
2. **Identify the economic characteristics of the industry.** We begin by identifying the characteristics of the firm's industry. Great Deal is a U.S. retailer of consumer electronics, home office products, entertainment software, appliances, and related services. The principal economic characteristics of this industry are as follows:
  - **Nature of products.** Great Deal offers products and services that are similar to the offerings of its competitors. Common terminology refers to such products as *commodities*.
  - **Extent of competition.** The industry is competitive, with many firms offering similar products. Barriers to entry for new competitors include size, distribution network, and market penetration.
  - **Growth characteristics.** The U.S. market is saturated, so further growth must come from introducing new store concepts and expanding internationally.
3. **Identify the company's strategy.** Next, we identify the firm's strategy to compete in its industry and gain competitive advantage. Great Deal emphasizes a broad product offering, relatively low prices, and superior service. Great Deal also sells through both physical stores and the internet.
4. **Calculate and interpret profitability and risk ratios.** Most financial statement analyses examine ratios that capture either profitability or risk. Ratios based on financial statement data provide one analytical tool used to evaluate profitability and risk. This chapter describes and illustrates key profitability and risk ratios.
 

In analyzing a firm's profitability or risk, it is often helpful to compare the firm's performance to a benchmark. Two common benchmarks are the firm's own performance in a prior period (*time-series analysis*), and competitors' performance in the same period (*cross-sectional analysis*). We illustrate both types of analyses later in this chapter.
5. **Prepare pro forma, or projected, financial statements.** After studying the profitability and risk of a firm in the recent past, the analyst often prepares pro forma, or projected, financial statements for the next three to five years, using assumptions about economic, industry, and firm-specific conditions.<sup>1</sup>
6. **Value the firm.** Analysts use projected net income, cash flows, and other items from the financial statements to value the firm. This textbook does not consider valuation, which is an advanced topic in accounting and finance.

## OBJECTIVES OF FINANCIAL STATEMENT ANALYSIS

The first question the analyst asks in analyzing a set of financial statements is, "What do I look for?" The response to this question requires an understanding of investment decisions. To illustrate, assume that you must decide how to invest a recent gift of \$25,000. You narrow the investment decision to purchasing either a certificate of deposit at a local bank or the common stock

<sup>1</sup>**Appendix 7.1** to this chapter illustrates the preparation of pro forma financial statements for Great Deal for fiscal year 2013 (the year ended February 27, 2014).

of Great Deal, Inc. Great Deal shares currently sell for \$25 per share. You will base your decision on the **return** you anticipate from each investment and the **risk** associated with that return.

The bank currently pays interest at the rate of 3% annually on certificates of deposit. Because the bank will likely remain in business, you feel confident you will earn 3% each year. The return from investing in Great Deal's common stock has two components. First, you anticipate that Great Deal will continue to pay a cash dividend of at least \$0.15 per share. Also, the market price of Great Deal's stock will likely change between the time you purchase the shares and the time you sell them in the future. The difference between the eventual selling price and the purchase price, often called *price appreciation* (or *price depreciation*, if negative), is the second component of the return from buying the stock.

The common stock investment involves more risk (that is, more variability of outcomes) than does the certificate of deposit investment. This is because Great Deal's future profitability will affect its future dividends and market price changes. If competitors open new stores or introduce new products or services that erode Great Deal's market share, future income might be less than you currently anticipate. On the other hand, if Great Deal opens new stores, or introduces successful new products or services, its future income might be greater than you currently anticipate. Economy-wide factors such as inflation and unemployment will also affect the market price of Great Deal's shares, as will factors such as changes in exchange rates that affect the cost of imported merchandise or government regulatory actions. Because most individuals prefer less risk to more risk, you will want a higher expected return if you purchase Great Deal's shares than if you invest in a certificate of deposit.

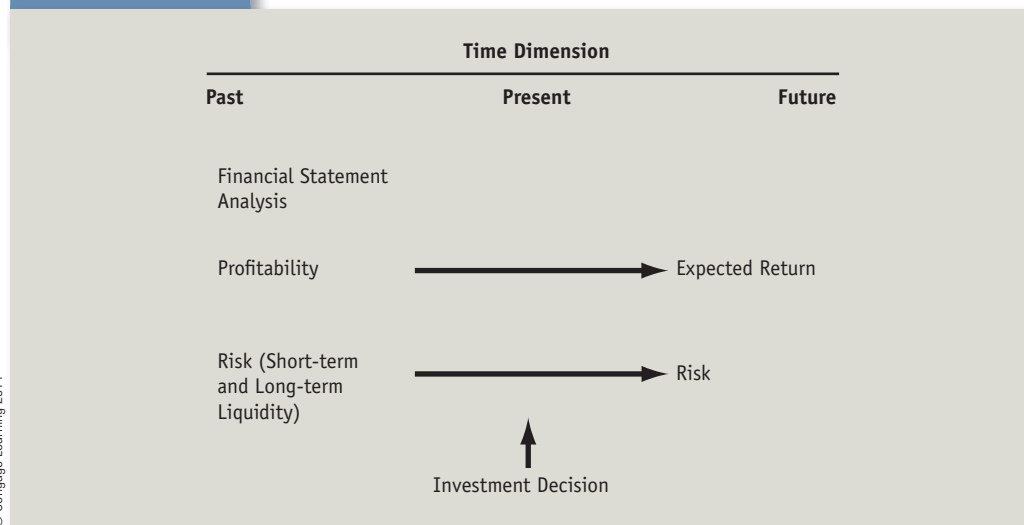
Theoretical and empirical research has shown that the expected return from investing in a firm relates, in part, to the expected profitability of the firm. The analyst studies a firm's past earnings to understand its operating performance and to help forecast its future profitability. Investment decisions also require assessing risk. A firm may find itself short of cash and unable to pay its suppliers on a timely basis. Or, it may have issued so much debt that it has difficulty meeting the required interest and principal payments. The financial statements provide information for assessing how these and other risk elements affect expected return. Most financial statement analysis, therefore, explores some aspect of a firm's profitability, or its risk, or both. **Figure 7.2** summarizes the relation between financial statement analysis and investment decisions.

## THE ROLE OF FINANCIAL STATEMENTS IN ASSESSING PROFITABILITY AND RISK

Readers cannot easily answer questions about a firm's profitability and risk from the raw information in financial statements. Nor can they easily compare two firms using these data. For example, one cannot assess profitability by examining the amount of net income. This is because a large amount of net income could result from a large firm earning small profits or

**FIGURE 7.2**

**Relation Between Financial Statement Analysis and Investment Decisions**



from a small firm earning large profits. Similarly, it would not be wise to conclude that two firms are of equivalent financial health simply because they report the same amount of income. Rather, it is important to consider the size of the firm when assessing its profitability or when comparing two firms. Financial analysis uses financial ratios and common-size financial statements to deal with size or scale differences in a firm's operations. Common-size income statements express each line in the income statement as a percentage of sales revenues. Common-size balance sheets express each line in the balance sheet as a percentage of total assets. We discuss common-size financial statements later in this chapter.

## FINANCIAL RATIOS

Financial ratios incorporate the scale of operations by, for example, relating the amount of income the firm generates to the amount of investment in assets. The analyst expresses the relation between two financial statement items (income and investment, for example) in the form of a ratio. Some ratios compare items within the income statement; some use only balance sheet data; others relate items from multiple financial statements. Ratios aid financial statement analysis because they summarize data in a form easy to understand, interpret, and compare. After calculating the ratios, the analyst must compare them with a benchmark. The following list provides several possible benchmarks for a financial ratio:

1. The planned ratio for the period.
2. The corresponding ratio during the preceding period for the same firm.
3. The corresponding ratio for a similar firm in the same industry.
4. The average ratio for other firms in the same industry.

To demonstrate the calculation of financial ratios, we use the financial statement data for Great Deal, Inc., for fiscal years 2010, 2011, and 2012, appearing in **Exhibit 1.1** (balance sheet), **Exhibit 1.2** (income statement), and **Exhibit 1.3** (statement of cash flows). We recommend that you trace the amounts in the financial ratios discussed in this chapter to the amounts in Great Deal's financial statements.

## ANALYSIS OF PROFITABILITY

A firm engages in operations to generate net income. For example, Great Deal sells electronics, office equipment and home appliances to consumers to generate net income. This section discusses two measures of **profitability**, return on equity and return on assets, and how these ratios relate to each other.

### RETURN ON EQUITY

**Return on equity (ROE)** measures a firm's performance in using the resources provided by shareholders to generate net income. This measure of profitability links net income to the portion of the firm's assets that shareholders have financed.

$$\text{ROE} = \frac{\text{Net Income}}{\text{Average Shareholders' Equity}}$$

The numerator of the ROE ratio is net income as reported in the income statement. Because net income includes payments to creditors (in the form of interest expense), net income can be thought of as the profits that are available to shareholders. We do not subtract dividends declared and paid to shareholders because dividends are distributions to shareholders of a portion of the returns generated for them during the period. The firm's board of directors makes the decision whether to pay dividends and specifies the amount. The denominator of the ROE ratio is the average amount of shareholders' equity for a period.<sup>2</sup> The average is taken over the time period in which net income (the numerator) was generated. For example, if the numerator

<sup>2</sup>The measure of shareholders' equity used in the ROE formula should be the balance sheet carrying value of the firm's common shareholders' equity. Thus, any preferred equity should be excluded. **Chapter 15** discusses preferred equity.

captures yearly net income, then the denominator should be the average of the beginning of year and end of year amounts of shareholders' equity.

Based on information from Great Deal's balance sheet (**Exhibit 1.1**) and income statement (**Exhibit 1.2**), Great Deal's ROE in fiscal 2012 is 21.7%:

$$\text{ROE} = \frac{\$1,317}{0.5 \times (\$5,156 + \$6,964)} = \frac{\$1,317}{\$6,060} = 21.7\%$$

Great Deal's 21.7% ROE means that each dollar of shareholders' equity generated 21.7 cents in net income. To determine whether an ROE of 21.7% indicates good or bad performance, we might compare Great Deal's 2012 ROE to Great Deal's ROE for the prior year. Great Deal's ROE for fiscal 2011 was 20.7%:

$$\text{ROE} = \frac{\$1,003}{0.5 \times (\$4,524 + \$5,156)} = \frac{\$1,003}{\$4,840} = 20.7\%$$

Great Deal's profitability (as measured by ROE) increased between 2011 and 2012.

## RETURN ON ASSETS

**Return on assets (ROA)** measures a firm's performance in using assets to generate net income independent of how those assets are financed (that is, with debt versus equity). ROA differs from ROE because ROE measures profitability for a specific form of financing—the portion provided by shareholders. The ROA formula is as follows:

$$\text{ROA} = \frac{\text{Net Income}}{\text{Average Total Assets}}$$

ROA is the ratio of net income for a given period to average total assets for that same period. We use the data in **Exhibit 1.1** and **Exhibit 1.2** to calculate Great Deal's ROA for fiscal 2012 as follows:

$$\text{ROA} = \frac{\text{Net Income}}{\text{Average Total Assets}} = \frac{\$1,317}{0.5 \times (\$15,826 + \$18,302)} = 7.7\%$$

Great Deal's ROA indicates that Great Deal earned \$0.077 for each dollar of assets in fiscal 2012. To determine whether this return indicates good or poor performance, we might compare Great Deal's 2012 ROA with its ROA for the previous year. We calculate Great Deal's ROA for fiscal 2011 as follows:

$$\text{ROA} = \frac{\text{Net Income}}{\text{Average Total Assets}} = \frac{\$1,003}{0.5 \times (\$12,758 + \$15,826)} = 7.0\%$$

These results indicate that Great Deal improved its use of assets between 2011 and 2012. ROA increased from \$0.07 per dollar of assets to \$0.077 per dollar of assets, or a 10% increase in ROA ( $10\% = [0.077 - 0.07]/0.07$ ).

## RELATION BETWEEN RETURN ON EQUITY AND RETURN ON ASSETS

Our previous analysis indicates that Great Deal's ROE exceeds its ROA. For example, in fiscal 2012 ROE was 21.7% compared to an ROA of 7.7%. What accounts for this relation, a common one for profitable firms? The key to understanding the relation between ROE and ROA lies in understanding **financial leverage**. Financial leverage measures the degree to which a firm's assets are financed with debt. Financial leverage links return on equity and return on assets as follows:

$$\begin{aligned} \text{ROE} &= \text{ROA} \times \text{Financial Leverage} \\ \frac{\text{Net Income}}{\text{Average Shareholders' Equity}} &= \frac{\text{Net Income}}{\text{Average Total Assets}} \times \frac{\text{Average Total Assets}}{\text{Average Shareholders' Equity}} \end{aligned}$$

This formula shows that return on equity equals return on assets multiplied by *financial leverage*, equal to the ratio of average total assets to average total shareholders' equity.<sup>3</sup> If a firm is 100% equity financed (i.e., no assets are financed by debt), its financial leverage ratio is 1 (or 100%). In contrast, a firm that financed 50% of its assets with equity would have a financial leverage ratio of 2 (or 200%).

**Exhibit 7.1** shows the components of Great Deal's ROE for fiscal years 2011 and 2012. Great Deal's financial leverage ratio (average total assets divided by average shareholders' equity) is 2.82 for fiscal 2012 ( $= [0.5 \times (\$15,826 + \$18,302)]/[0.5 \times (\$5,156 + \$6,964)]$ ). A financial leverage ratio of 2.82 means that each dollar of equity finances about \$2.82 of assets. The deviation of this ratio from 1.0 captures the degree to which assets are financed by non-equity source of funds. We also see that the product of Great Deal's ROA ratio (7.7%) and its financial leverage ratio (2.82) equals its ROE for 2012, 21.7%.

Comparing Great Deal's ROE and ROE components in 2012 to those in 2011 reveals that the increase in ROE between 2011 and 2012 resulted from two offsetting effects. First, Great Deal's ROA increased from 7.0% to 7.7%. Second, Great Deal's financial leverage declined from 2.95 to 2.82. Because ROE increased overall, we can conclude that the first effect (the increase in ROA) exceeded the second effect (the decline in financial leverage).

## CONCEPTUAL NOTE

The use of average total assets as the denominator in the ROA ratio means that the firm's financing decisions do not affect the denominator of this ratio. Those financing decisions do, however, affect the numerator of ROA (net income) because interest expense reduces net income.

To incorporate the effect of interest costs, the analyst adjusts the numerator of the ROA formula for the effects of financing choices. This adjustment results in the following adjusted ROA formula:

$$\text{ROA} = \frac{\text{Net Income} + \text{After-tax Interest Expense}}{\text{Average Total Assets}}$$

The adjusted ROA formula adds back interest expense (adjusted for its tax effects) to net income. Interest expense is deducted on the firm's tax return in calculating taxable income, which is the income on which the firm pays taxes. Other things equal, interest expense benefits the firm by reducing its taxable income and, therefore, reducing its taxes paid. The amount of taxes saved or shielded because of the tax deductibility of interest expense is the amount of interest expense times one minus the firm's tax rate. Because it includes

an adjustment to income for the effects of the firm's financing choices, the adjusted ROA formula is the technically correct formula for calculating ROA. Great Deal's adjusted ROA for fiscal 2012 and fiscal 2011 are calculated as follows:<sup>4</sup>

$$\begin{aligned} \text{2012} \\ \text{ROA} &= \frac{\text{Net Income} + \text{After-tax Interest Expense}}{\text{Average Total Assets}} \\ &= \frac{\$1,317 + (1 - 0.365)(\$94)}{0.5 \times (\$15,826 + 18,302)} = 8.1\% \end{aligned}$$

$$\begin{aligned} \text{2011} \\ \text{ROA} &= \frac{\text{Net Income} + \text{After-tax Interest Expense}}{\text{Average Total Assets}} \\ &= \frac{\$1,003 + (1 - 0.396)(\$94)}{0.5 \times (\$12,758 + 15,826)} = 7.4\% \end{aligned}$$

Although the adjusted formula is the correct formula to use when ROA is calculated on a standalone basis, it is not the formula that is used in the decomposition of ROE. Therefore, for purposes of this chapter, we use the unadjusted formula when we refer to the ROA ratio.

<sup>3</sup>Financial leverage can be measured in a number of ways including the ratio of average total debt to average total assets, the ratio of average shareholders' equity to average total assets, and the inverse of either of these ratios. The formula above uses the ratio of average total assets to average shareholders' equity.

<sup>4</sup>Great Deal's tax rate is 39.6% in fiscal 2011 and 36.5% in fiscal 2012.

**EXHIBIT 7.1**

**Great Deal, Inc.  
Components of the Return on Equity**

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	ROE	=	Return on Assets	×	Financial Leverage
2012.....	21.7%	=	7.7%	×	2.82
2011.....	20.7%	=	7.0%	×	2.95

**▶ PROBLEM 7.1 FOR SELF-STUDY**

**Analyzing return on equity.** Balance sheets and income statements for Markum Corporation are provided in Exhibits 7.2 and 7.3, respectively. Using the information in these financial statements, answer the following questions about Markum’s profitability.

- a. What was Markum’s return on equity (ROE) for 2013?
- b. What was Markum’s return on assets (ROA) for 2013?
- c. Why is Markum’s ROE different from its ROA in 2013?

**EXHIBIT 7.2**

**Markum Corporation  
Consolidated Balance Sheets  
For Years 2012 and 2013  
(in millions of US\$)**

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	2013		2012	
<b>Assets</b>				
Cash and Cash Equivalents .....	\$ 6,000	4.8%	\$ 4,000	4.0%
Receivables .....	15,000	12.1%	12,000	12.0%
Merchandise Inventories .....	28,000	22.6%	20,000	20.0%
Total Current Assets .....	\$ 49,000	39.5%	\$ 36,000	36.0%
Property, Plant, and Equipment, Net .....	75,000	60.5%	64,000	64.0%
Total Assets .....	<u>\$124,000</u>	<u>100.0%</u>	<u>\$100,000</u>	<u>100.0%</u>
<b>Liabilities and Shareholders’ Equity</b>				
Accounts Payable.....	\$ 31,000	25.0%	\$ 24,800	24.8%
Accrued Wages and Other.....	19,000	15.3%	16,000	16.0%
Total Current Liabilities .....	\$ 50,000	40.3%	\$ 40,800	40.8%
Long-Term Debt.....	18,000	14.5%	12,000	12.0%
Shareholders’ Equity:				
Common Stock .....	1,500	1.2%	1,000	1.0%
Additional Paid-in Capital .....	24,500	19.8%	18,000	18.0%
Retained Earnings.....	30,000	24.2%	28,200	28.2%
Total Shareholders’ Equity .....	\$ 56,000	45.2%	\$ 47,200	47.2%
Total Liabilities and Shareholders’ Equity .....	<u>\$124,000</u>	<u>100.0%</u>	<u>\$100,000</u>	<u>100.0%</u>

**EXHIBIT 7.3**
**Markum Corporation  
Consolidated Income Statements  
For Years 2012 and 2013  
(amounts in millions of US\$)**

	2013		2012	
Revenue .....	\$92,000	100.0%	\$85,000	100.0%
Cost of Goods Sold .....	67,000	72.8%	70,000	82.4%
Gross Profit .....	\$25,000	27.2%	\$15,000	17.6%
Selling, General, and Administrative Expenses .....	8,000	8.7%	6,000	7.0%
Research and Development Expenses .....	7,000	7.6%	5,000	5.9%
Operating Income .....	\$10,000	10.9%	\$ 4,000	4.7%
Interest Expense .....	2,000	2.2%	1,000	1.2%
Income Before Income Tax Expense .....	\$ 8,000	8.7%	\$ 3,000	3.5%
Income Tax Expense .....	3,200	3.5%	1,200	1.4%
Net Income .....	<u>\$ 4,800</u>	<u>5.2%</u>	<u>\$ 1,800</u>	<u>2.1%</u>
Tax Rate .....	40.0%		40.0%	

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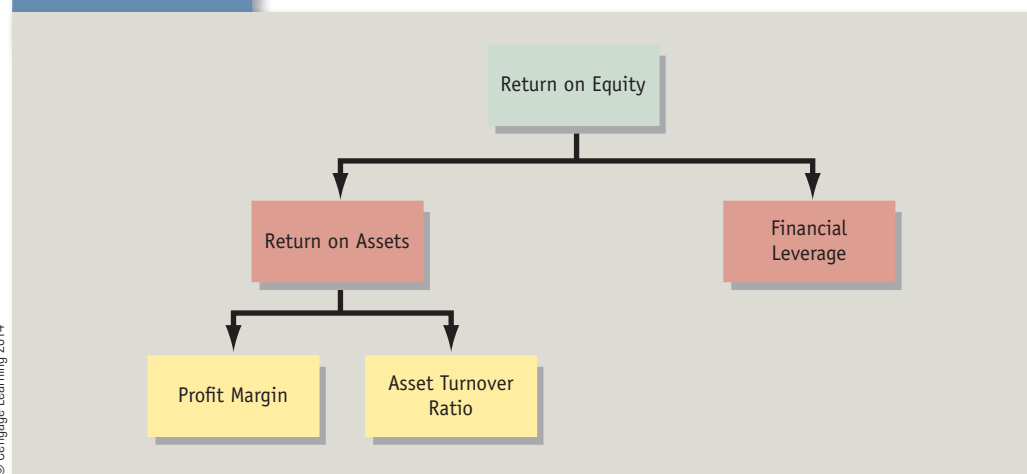
**DUPONT DECOMPOSITION ANALYSIS**

A useful tool for understanding the sources of a firm's profitability (as measured by ROE and ROA) is the **DuPont Decomposition Analysis**. This analysis disaggregates ROE into the financial leverage and ROA components (as we did in the previous section), and then disaggregates ROA further into the product of two other ratios: the **profit margin ratio** and the **asset turnover ratio** (also called the total assets turnover). **Figure 7.3** illustrates this breakdown.

The ROA disaggregation is as follows:

$$\text{ROA} = \text{Profit Margin} \times \text{Asset Turnover Ratio}$$

$$\frac{\text{Net Income}}{\text{Average Total Assets}} = \frac{\text{Net Income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Average Total Assets}}$$

**FIGURE 7.3****DuPont Decomposition of ROE and ROA**

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The profit margin ratio (net income divided by sales revenue) measures a firm's ability to control the level of expenses relative to sales, to increase selling prices relative to the level of expenses incurred, or a combination of the two. By controlling expenses or increasing selling prices, a firm can increase the profits from a given amount of sales activity and improve its profit margin.

The asset turnover ratio measures a firm's ability to generate sales from its investment in assets, or alternatively, to control the amount of assets it uses to generate a particular level of sales revenues. The smaller the amount of assets the firm needs to generate a given level of sales, the better (larger) its assets turnover and the more profitable the firm.

**Exhibit 7.4** presents the disaggregation of ROA for Great Deal into the profit margin ratio and asset turnover ratio for fiscal years 2011 and 2012. The data show that the previously noted increase in ROA from 7.0% in 2011 to 7.7% in 2012 is the result of two offsetting factors:

- An increase in profit margin from 2.22% to 2.65% and
- A decline in asset turnover from 3.15 to 2.91.

To pinpoint the causes of these changes, we analyze the changes in the profit margin and asset turnover ratios, in the next section.

A firm can improve its ROA by increasing the profit margin ratio, the rate of asset turnover, or both. It may be difficult to alter one or the other of these components. For example, a firm that sells commodity products in a competitive market likely has little opportunity to increase its profit margin by increasing prices. Such a firm would need to improve its total assets turnover (for example, shortening the holding period for inventories by imposing tighter inventory controls) to increase its ROA. A firm whose activities require substantial investments in property, plant, and equipment and that operates efficiently near its capacity has limited ability to increase its ROA by increasing its total assets turnover. Such a firm might have more flexibility to take actions that increase the profit margin (for example, by creating brand loyalty for its products to increase sales).

The profit margin and asset turnover ratios are also related to each other. Holding other factors constant, we would expect that reducing the selling prices of products (thus reducing the profit margin) would increase sales of those products (thus increasing the asset turnover ratio). Conversely, raising selling prices (thus increasing the profit margin) would reduce sales volumes (thus reducing the asset turnover ratio).

### ANALYZING CHANGES IN THE PROFIT MARGIN RATIO

Changes in a firm's expenses relative to sales cause the profit margin ratio to change. To see the relation, we express the individual line items on the income statement as a percentage of sales. These percentages, for each individual expense and net income, are collectively referred to as a *common-size income statement*. The common-size income statements for Great Deal for fiscal years 2010–2012 are shown in **Exhibit 7.5**. **Exhibit 7.5** indicates that Great Deal's profit margin increased between 2011 and 2012 because of the following effects:

- Cost of sales as a percentage of sales declined from 75.6% to 75.5%. Possible reasons for this decline include:
  - Great Deal's increasing size (as measured by the growth in total assets between 2011 and 2012) may have allowed it to purchase merchandise at lower cost, either because of quantity discounts or greater bargaining power over suppliers.

#### EXHIBIT 7.4

#### Great Deal, Inc. Disaggregation of ROA for 2011 and 2012

	ROA	=	Profit Margin	×	Asset Turnover Ratio
2012.....	7.7%	=	2.65%	×	2.91
2011.....	7.0%	=	2.22%	×	3.15

**EXHIBIT 7.5**

**Great Deal, Inc.**  
**Common-Size Income Statements**  
**For Years 2012, 2011, and 2010**  
**(amounts in millions of US\$)**

	2012		2011		2010	
<b>Revenue</b>	\$49,694	100.0%	\$45,015	100.0%	\$40,023	100.0%
Cost of Goods Sold.....	<u>37,534</u>	<u>75.5%</u>	<u>34,017</u>	<u>75.6%</u>	<u>30,477</u>	<u>76.1%</u>
Gross Profit.....	\$12,160	24.5%	\$10,998	24.4%	\$ 9,546	23.9%
Selling, General, and Administrative Expenses.....	9,873	19.9%	8,984	20.0%	7,385	18.5%
Restructuring Charges.....	52	0.1%	78	0.2%	0	0.0%
Goodwill and Trade Name Impairment.....	<u>0</u>	<u>0.0%</u>	<u>66</u>	<u>0.1%</u>	<u>0</u>	<u>0.0%</u>
Operating Income.....	\$ 2,235	4.5%	\$ 1,870	4.1%	\$ 2,161	5.4%
Other Income (Expense)						
Investment Income and Other.....	54	0.1%	35	0.1%	129	0.3%
Investment Impairment.....	0	0.0%	(111)	-0.2%	0	0.0%
Interest Expense.....	<u>(94)</u>	<u>-0.2%</u>	<u>(94)</u>	<u>-0.2%</u>	<u>(62)</u>	<u>-0.2%</u>
Earnings Before Income Tax Expense and Equity in Income (Loss) of Affiliates.....	\$ 2,195	4.4%	\$ 1,700	3.8%	\$ 2,228	5.5%
Income Tax Expense.....	802	1.6%	674	1.5%	815	2.0%
Equity in Income (Loss) of Affiliates.....	<u>1</u>	<u>0.0%</u>	<u>7</u>	<u>0.0%</u>	<u>(3)</u>	<u>0.0%</u>
Net Earnings Including Noncontrolling Interests.....	\$ 1,394	2.8%	\$ 1,033	2.3%	\$ 1,410	3.5%
Net Earnings Attributable to Noncontrolling Interests.....	<u>(77)</u>	<u>-0.2%</u>	<u>(30)</u>	<u>-0.1%</u>	<u>(3)</u>	<u>0.0%</u>
Net Earnings Attributable to Great Deal, Inc.....	<u>\$ 1,317</u>	<u>2.6%</u>	<u>\$ 1,003</u>	<u>2.2%</u>	<u>\$ 1,407</u>	<u>3.5%</u>

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- Great Deal may have shifted its sales mix toward products or geographical markets with lower cost of goods sold to sales percentages.
- Great Deal may have improved its controls over the purchase, storage, and delivery of merchandise, reducing the cost of storage and obsolescence.
- Selling, general, and administrative (SG&A) expenses, as percentages of sales, declined from 20.0% to 19.9%. Possible reasons for this decline include:
  - A competitor's bankruptcy may have reduced competition, permitting Great Deal to reduce advertising and other marketing costs.
  - Great Deal may have improved its distribution channels, resulting in lower SG&A expenses.
  - Great Deal may have shifted its sales mix toward products or geographical markets with lower levels of selling or administrative expenses.
- Both restructuring charges and impairment charges declined as a percentage of sales. Restructuring charges declined from 0.2% to 0.1% and impairment charges declined from 0.1% to 0.0%. The declines in these percentages indicate that Great Deal had fewer restructuring events and fewer impairments in fiscal 2012 compared to fiscal 2011.

### ANALYZING CHANGES IN THE ASSET TURNOVER RATIO

Changes in the rate of turnover of specific types of assets result in changes in the total assets turnover ratio. The analyst generally calculates separate turnover ratios for three types of assets: accounts receivable, inventory, and fixed assets.

**Accounts Receivable Turnover** The rate at which accounts receivable turn over indicates how quickly a firm collects cash from credit sales. The **accounts receivable turnover ratio** equals sales revenue divided by average accounts receivable during the period:<sup>5</sup>

$$\frac{\text{Sales}}{\text{Average Accounts Receivable}}$$

The accounts receivable turnover ratio for Great Deal in fiscal 2012 is as follows:

$$\frac{\text{Sales}}{\text{Average Accounts Receivable}} = \frac{\$49,694}{0.5 \times (\$1,868 + \$2,020)} = 25.6 \text{ times per year}$$

The analyst often expresses accounts receivable turnover in terms of the average number of days that elapse between the time the firm makes the sale and the time it later collects the cash. This calculation is called *days accounts receivable are outstanding* or *days outstanding for receivables*. To calculate this ratio, divide 365 days by the accounts receivable turnover ratio. The days outstanding for accounts receivable for Great Deal during fiscal 2012 was 14.3 days (= 365 days/25.6 times per year). During fiscal 2011 its accounts receivable turnover was 37.2 or 9.8 days. The declining accounts receivable ratios and the increasing days outstanding for receivables indicate that Great Deal has been slower to convert sales into cash collections in fiscal 2012 compared to fiscal 2011. The declining accounts receivable turnover and increased number of days on average to collect accounts receivable may result from the following factors:

- Great Deal may, over time, be increasing the fraction of its sales made on credit (versus cash). Because our calculation includes cash sales (erroneously) in the numerator but not the denominator of the accounts receivable turnover ratio, a shift in the portion of cash sales over time will create shifts in the ratio itself.
- Great Deal may be offering customers more attractive (to the customer) payment terms in order to increase sales. All else equal, customers would prefer to pay for sales later rather than earlier.

Most firms that sell to other businesses, as opposed to consumers, sell on account and collect within 30 to 90 days. Interpreting any particular firm's accounts receivable turnover and days receivable outstanding requires knowing the terms of sale. If a firm's terms of sale are "net 30 days" and the firm collects its accounts receivable in 45 days, then collections do not match the stated terms. Such a result warrants a review of the credit and collection activity to ascertain the cause and to guide corrective action. If the firm offers terms of "net 45 days," a days receivable outstanding of 45 days indicates that the firm handles accounts receivable in accord with stated terms.

Many firms sell to customers on account as a strategy to stimulate sales. Customers may purchase more willingly and purchase more if they are provided credit. Such firms may also encourage customers to delay paying for their purchases as a means for the selling firm to generate interest revenue through finance charges on the unpaid amounts. Thus, comparing accounts receivable turnovers over time or across firms requires an analysis of the growth rate in sales, the amount of interest revenue generated, the cost of administering the credit-granting activity, and the losses from uncollectible accounts.

**Inventory Turnover** The **inventory turnover ratio** indicates how fast firms sell their inventory, measured in terms of the rate of movement of goods into and out of the firm. Inventory turnover equals cost of goods sold divided by the average inventory during the period:

$$\frac{\text{Cost of Goods Sold}}{\text{Average Inventory}}$$

<sup>5</sup>In theory, the numerator should include only credit sales (i.e., exclude cash sales) if the objective is to measure how quickly a firm collects its accounts receivable. Many firms, except some retailers that deal directly with consumers (such as fast food outlets), sell their goods and services on credit. Other firms, such as Great Deal, have both cash sales and credit sales. Firms seldom disclose the proportions of cash and credit sales in their financial reports. Thus, the analyst uses sales revenue in the numerator of the accounts receivable turnover ratio, recognizing that the inclusion of cash sales increases the numerator and thereby overstates the receivables turnover ratio.

The numerator equals the cost of inventories sold during the period.<sup>6</sup> The denominator equals the average cost of inventories on hand during the period. The inventory turnover ratio for Great Deal for fiscal 2012 is as follows:

$$\frac{\text{Cost of Goods Sold}}{\text{Average Inventory}} = \frac{\$37,534}{0.5 \times (\$4,753 + \$5,486)} = 7.3 \text{ times per year}$$

Items remain in inventory an average of 50.0 days (= 365 days/7.3 times per year) before sale. In fiscal 2011, Great Deal's inventory turnover ratio was 7.2 times or 50.7 days. The increasing inventory turnover ratio (and declining days inventory) might result from the following factors:

- Improved inventory control systems, which would reduce the levels of inventory and the cost of storage and obsolescence. This explanation is consistent with the decreased cost of goods sold to sales percentage discussed earlier.
- A shift in sales mix toward DVDs or CDs or other products that turn over more quickly.

Managing inventory turnover involves two opposing considerations. On the one hand, for a given amount of profit margin on the goods, firms prefer to sell as many goods as possible with a minimum of assets tied up in inventories. An increase in the rate of inventory turnover between periods indicates reduced costs of financing the inventory. On the other hand, management does not want to have so little inventory on hand that shortages result in lost sales. Increases in the rate of inventory turnover caused by inventory shortages could signal a loss of customers, thereby offsetting any advantage gained by decreased investment in inventory. Firms must balance these opposing considerations in setting the level of inventory and, thus, the rate of inventory turnover.

**Fixed-Asset Turnover** The **fixed-asset turnover ratio** measures the relation between sales and the investment in fixed assets—property, plant, and equipment. It is more difficult to understand the notion that fixed assets “turn over” than to understand turnover for inventory. A more appropriate title for the fixed-asset turnover ratio might be the *fixed-asset productivity ratio* because it measures the sales generated from a particular level of investment in fixed assets:

$$\frac{\text{Sales}}{\text{Average Fixed Assets}}$$

The fixed-asset turnover ratio for Great Deal for fiscal 2012 is as follows:

$$\frac{\text{Sales}}{\text{Average Fixed Assets}} = \frac{\$49,694}{0.5 \times (\$4,174 + \$4,070)} = 12.1 \text{ times per year}$$

Thus, \$1.00 invested in fixed assets during fiscal 2012 generated \$12.10 in sales. In fiscal 2011, \$1.00 invested in fixed assets generated \$12.00 in sales. Thus, the fixed-asset turnover increased between 2011 and 2012. The analyst should interpret changes in the fixed-asset turnover ratio cautiously. Firms often invest in fixed assets (for example, new production facilities) well before these assets generate sales from products manufactured in their plants or sold in their stores. Thus, a low or decreasing fixed-asset turnover ratio may indicate an expanding firm preparing for future growth. On the other hand, a firm anticipating a decline in product sales could cut back its expenditures on fixed assets, thus increasing the fixed-asset turnover ratio.

Some analysts find the reciprocal of the fixed-asset turnover ratio helpful in comparing the operating characteristics of different firms. The reciprocal ratio measures the investment in fixed assets required to generate sales. For Great Deal, this reciprocal for 2012 is \$0.08

<sup>6</sup>Some analysts calculate the inventory turnover ratio using sales, rather than cost of goods sold, as the numerator. As long as the ratio of selling price to cost of goods sold remains relatively constant, either measure will identify changes in the trend of the inventory turnover ratio. Using sales in the numerator, however, will lead to incorrect measures of the inventory turnover ratio for calculating the average number of days that inventory is on hand until sale.

(=  $\$1.0/\$12.1$  times). This calculation implies that Great Deal required \$0.08 of fixed assets to generate \$1.00 of sales in fiscal 2012.

**Summary of Asset Turnover Ratios** Exhibit 7.6 presents the four turnover ratios discussed for Great Deal, for fiscal years 2011 and 2012. We noted earlier that the asset turnover ratio for Great Deal declined between 2011 and 2012. The accounts receivable turnover ratio decreased from 37.2 to 25.6 between 2011 and 2012. Accounts receivable represent 11% (=  $\$2,020/\$18,302$ ) of Great Deal's total assets in fiscal 2012. The decreasing accounts receivable turnover ratio, taken alone, would decrease the total assets turnover. Inventory and fixed assets, on the other hand, together comprise approximately 52% of total assets (=  $[\$5,486 + \$4,070]/\$18,302$ ) and both of these ratios increased by small amounts. The small changes in the inventory turnover ratio and the fixed-asset turnover ratio, coupled with the larger amounts of these assets, do not offset the effects of the decline in the accounts receivable turnover ratio. The offsetting effects of changes in these three asset turnover ratios led to the decline in the total assets turnover ratio between 2011 and 2012.

### SUMMARY OF THE DUPONT DECOMPOSITION ANALYSIS

The DuPont decomposition analysis helps the analyst understand the sources of a firm's performance as measured by return on equity. The DuPont analysis shows the following:

- ROE results from the interaction of its components: ROA and financial leverage. Financial leverage captures the choice about the portion of assets to finance through debt versus equity.
- ROA results from the interaction of its components: profit margin and asset turnover. The profit margin results from the relation of expenses to sales. Asset turnover reflects the effects of turnover ratios for accounts receivable, inventory, and fixed assets.

#### PROBLEM 7.2 FOR SELF-STUDY

**Analyzing the return on assets.** Refer to the information for Markum Corporation provided in **Problem 7.1** for Self-Study. Identify the likely reasons for the increasing return on assets ratio for 2013. Use common-size income statement percentages and individual asset turnover ratios in your interpretations.

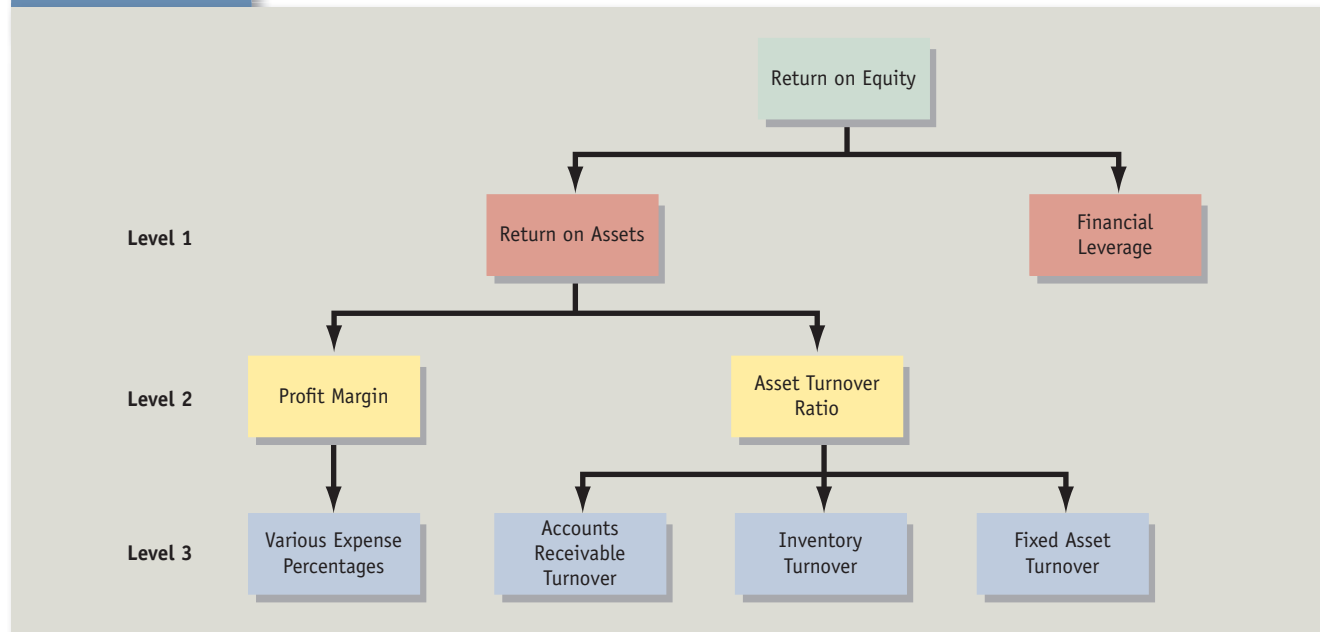
### SUMMARY OF PROFITABILITY ANALYSIS

This chapter introduces two broad measures for assessing profitability: ROE and ROA. **Figure 7.4** summarizes the discussion. At Level 1, ROA and ROE measure overall profitability and the effect of financial leverage. At Level 2, we disaggregate ROA into its profit margin and asset turnover components. At Level 3, we further disaggregate the profit margin and asset turnover ratios to gain additional insights into reasons for changes in profitability.

#### EXHIBIT 7.6

#### Great Deal Inc. Asset Turnover Ratios

	2012	2011
Total Assets Turnover . . . . .	2.9	3.2
Accounts Receivable Turnover . . . . .	25.6	37.2
Inventory Turnover . . . . .	7.3	7.2
Fixed-Asset Turnover . . . . .	12.1	12.0

**FIGURE 7.4** Complete DuPont Decomposition


## ANALYSIS OF RISK

Investors deciding among potential investments must consider the comparative risks of those investments. Various factors affect the risk of a business enterprise:

1. Macroeconomic factors, such as inflation, interest rates, and unemployment rates.
2. Industry factors, such as competition, changes in technology, and changes in regulations.
3. Firm-specific factors, such as labor strikes, loss of facilities due to fire or other casualty, or key skills and talents of the management team.

An important risk assessment concerns **liquidity**, which refers to whether the firm is able to pay its bills in a timely manner. Assessing liquidity requires a time horizon. Consider the three questions that follow:

1. Does a firm have sufficient cash to pay its employees tomorrow?
2. Will the firm have sufficient cash to pay its suppliers in six months?
3. Will the firm have sufficient cash to repay a loan due in five years?

To answer the first question, we examine whether the amount of cash on hand and in the bank is sufficient to pay amounts owed to employees tomorrow. To answer the second question, we need to know the amount of cash the firm expects to generate from operations during the next six months, as well as the amount of any new borrowing that the firm expects to undertake. Cash obtained from either of these sources could be used to pay suppliers. To answer the third question, we focus on the long-run cash-generating ability of the firm and determine whether the amount of cash generated is sufficient to repay long-term debt as it comes due. Questions 1 and 2 capture the firm's short-term liquidity risk. Question 3 captures the firm's long-term liquidity risk. We turn next to financial ratios that capture short-term and long-term liquidity risk.

### MEASURES OF SHORT-TERM LIQUIDITY RISK

This section discusses four measures for assessing **short-term liquidity risk**:

1. Current ratio,
2. Quick ratio,
3. Cash flow from operations to current liabilities ratio, and
4. Working capital turnover ratios.

**Current Ratio** The **current ratio** equals current assets divided by current liabilities. Current assets comprise cash and assets that a firm expects to turn into cash or sell or consume within approximately one year of the balance sheet date. Current liabilities include obligations that will require cash (or the rendering of services) within approximately one year. Thus, the current ratio indicates a firm's ability to meet its short-term obligations. A current ratio of at least 1.0 indicates that the firm has sufficient current assets on hand to cover its obligations due in the coming year. As shown below, Great Deal's current ratio increased between fiscal years 2011 and 2012, from 0.97 to 1.18:

Current Ratio	= $\frac{\text{Current Assets}}{\text{Current Liabilities}}$
2012: \$10,566/\$8,978 . . . . .	1.18
2011: \$8,192/\$8,435 . . . . .	0.97

Changes in the trend of the current ratio can mislead. For example, when the current ratio exceeds 1.0, an increase of equal amount in both current assets and current liabilities results in a decline in the ratio, whereas equal decreases result in an increased current ratio.<sup>7</sup> An implication of this arithmetic relation is that during a recession (when there are fewer growth opportunities), a firm may use its cash to pay its current liabilities, causing the current ratio to increase. In contrast, during a boom period, a firm may conserve cash (in order to finance growth opportunities) by delaying payment of current liabilities, causing the current ratio to decrease. Thus, a high current ratio may accompany deteriorating business conditions, whereas a falling ratio may accompany profitable operations.

Furthermore, management can take actions to present a better current ratio at the balance sheet date than the normal current ratio during the rest of the year. For example, near the end of its accounting period a firm might delay purchases of inventory on account. Or, it might hasten the collection of a noncurrent loan receivable and use the proceeds to reduce current liabilities. Such actions will increase the current ratio. Analysts refer to such actions as *window dressing*.

**Quick Ratio** A variation of the current ratio is the **quick ratio** (sometimes called the **acid test ratio**). The quick ratio includes in the numerator only current assets that a firm could convert quickly into cash, typically, cash, marketable securities, and accounts receivable. Some businesses can convert their inventory into cash more quickly than other businesses can convert their receivables. The facts in each case will indicate whether the analyst should include receivables or exclude inventories. For purposes of this textbook, assume the numerator includes accounts receivable and excludes inventories. The denominator includes all current liabilities. A quick ratio approximately one-half of the current ratio is typical, although this varies by industry.

Assuming the quick ratio of Great Deal includes accounts receivable and excludes inventory, the quick ratios for fiscal 2011 and 2012 are as follows:

Quick Ratio	= $\frac{\text{Cash, Marketable Securities, Accounts Receivable}}{\text{Current Liabilities}}$
2012: (\$1,826 + \$90 + \$2,020)/\$8,978 . . . . .	0.44
2011: (\$498 + \$11 + \$1,868)/\$8,435 . . . . .	0.28

Great Deal's quick ratio, like its current ratio, increased between 2011 and 2012 because of increases in cash, marketable securities, and accounts receivable. For both years, Great Deal's quick ratio is below the benchmark of one-half the current ratio. This is likely because Great Deal's largest current asset, inventory, is not reflected in the quick ratio. Because it is reasonable

<sup>7</sup>The general rule is that adding equal amounts to both the numerator and the denominator of a fraction moves that fraction closer to 1.0, whereas subtracting equal amounts from both the numerator and the denominator of a fraction makes that fraction diverge from 1.0.

to believe that Great Deal could sell most if not all of its inventory quickly if it wanted to, we can calculate its quick ratios including inventory:

Quick Ratio Including Inventory	= $\frac{\text{Cash, Marketable Securities, Accounts Receivable, and Inventory}}{\text{Current Liabilities}}$
2012: $(\$1,826 + \$90 + \$2,020 + \$5,486)/\$8,978$ . . . . .	1.05
2011: $(\$498 + \$11 + \$1,868 + \$4,753)/\$8,435$ . . . . .	0.85

These data indicate that Great Deal's quick ratios are much higher when inventory is included.

**Cash Flow from Operations to Current Liabilities Ratio** Some analysts criticize the current ratio and the quick ratio as measures of short-term liquidity risk because these ratios use balance sheet amounts at a specific time. If financial statement amounts at that time are unusually large or small, the resulting ratios will not reflect normal conditions. If management knows that analysts will evaluate the firm using one of these ratios at a particular time, it can take steps to window dress that ratio. An example of the latter would be if a firm used cash to pay off a current liability (reducing both numerator and denominator) or acquired inventory on account (increasing both numerator and denominator).

The **cash flow from operations to current liabilities ratio** overcomes these deficiencies. The numerator of this ratio is cash flow from operations for the period and the denominator is average current liabilities for the period. Healthy mature firms typically have a ratio of 40% or more. The cash flow from operations to current liabilities ratios for Great Deal for 2011 and 2012 are as follows:

Cash Flow from Operations to Current Liabilities Ratio	= $\frac{\text{Cash Flow from Operations}}{\text{Average Current Liabilities}}$
2012: $\$2,206/[0.5 \times (\$8,435 + \$8,978)]$ . . . . .	25.3%
2011: $\$1,877/[0.5 \times (\$6,769 + \$8,435)]$ . . . . .	24.7%

Great Deal's cash flow from operations to current liabilities ratios are below the 40% benchmark.

**Working Capital Turnover Ratios** Working capital turnover ratios help to assess a firm's **operating cycle (cash cycle, earnings cycle)**, which captures the length of time from the expenditure of cash to purchase or produce products for sale to the sale of products, collections from customers and payments to suppliers. Thus, the operating cycle can be thought of as the time period over which the firm needs to finance its operating outlays, equal to the net outlays associated with its production, sales, collection and payment cycles. During the operating cycle, a retailing firm such as Great Deal has several transactions:

1. Purchases inventory on account from suppliers,
2. Sells inventory for cash or on account to customers,
3. Collects amounts due from customers, and
4. Pays amounts due to suppliers.

This cycle recurs for most businesses. The number of days a firm holds inventories (that is, 365 days/inventory turnover ratio) indicates the length of the period between the purchase and the sale of inventory during each operating cycle. The number of days receivables remain outstanding (that is, 365 days/accounts receivable turnover ratio) indicates the length of the period between the sale of inventory and the collection of cash from customers during each operating cycle.



Firms must finance their investments in inventories and accounts receivable. Suppliers typically provide a portion of the needed financing. The number of days accounts payable remain outstanding (that is, 365 days/accounts payable turnover ratio) indicates the length of the period between the purchase of inventory on account and the payment of cash to suppliers during each operating cycle. The **accounts payable turnover ratio** equals purchases on account divided by average accounts payable. Although firms do not disclose their purchases, the analyst can derive the amount for a merchandising firm as follows:

$$\text{Beginning Inventory} + \text{Purchases} = \text{Cost of Goods Sold} + \text{Ending Inventory}$$

Rearranging terms yields the following:

$$\text{Purchases} = \text{Cost of Goods Sold} + \text{Ending Inventory} - \text{Beginning Inventory}$$

Great Deal's purchases appear below for 2011 and 2012:

	<b>Purchases</b>	=	<b>Cost of Goods Sold</b>	+	<b>Ending Inventory</b>	-	<b>Beginning Inventory</b>
2012	\$38,267	=	\$37,534	+	\$5,486	-	\$4,753
2011	\$34,062	=	\$34,017	+	\$4,753	-	\$4,708

The accounts payable turnover ratios for Great Deal for fiscal 2011 and 2012 are as follows:

<b>Accounts Payable Turnover Ratio</b>	=	<b>Purchases</b>	<b>Average Accounts Payable</b>
2012: \$38,267/[0.5 × (\$4,997 + \$5,276)]			7.45
2011: \$34,062/[0.5 × (\$4,297 + \$4,997)]			7.33

The average number of days Great Deal's payables were outstanding was 49.8 days (= 365/7.33) in 2011 and 49.0 days (= 365/7.45) in 2012. Interpreting the accounts payable turnover ratio involves opposing considerations. An increase in the accounts payable turnover ratio (a decrease in days payable) indicates that a firm pays its obligations to suppliers more quickly, requiring cash and even wasting the benefits of cash if the firm makes payments earlier than necessary. On the other hand, a faster accounts payable turnover also means a smaller relative amount of accounts payable that the firm must pay in the near future. Most firms want to extend their payables as long as they can, but they also want to maintain their relations with suppliers. Businesses, therefore, negotiate for favorable payment terms and then delay paying until just before the last agreed moment.

The period of time (in days) during which a firm converts cash into goods and services, then sells those goods and services to customers, then collects cash from those customers is the firm's operating cycle. We calculate Great Deal's operating cycle as follows:

<b>Year</b>	<b>Days Inventory</b>	+	<b>Days Accounts Receivable</b>	-	<b>Days Accounts Payable Outstanding</b>	=	<b>Operating Cycle</b>
2012	50.0	+	15.1	-	49.0	=	16.1
2011	50.7	+	9.8	-	49.8	=	10.7

Great Deal reduced its days inventory, increased its days receivables, and reduced its days payable between 2011 and 2012. The net effect of these changes was to increase Great Deal's operating cycle by 5.4 days (from 10.7 days to 16.1 days) between 2011 and 2012. Inspection of the components of the operating cycle reveals that this increase is primarily due to the increase in days receivables from 9.8 days to 15.1 days. Great Deal's 2012 operating cycle of 16.1 days

means that Great Deal's operating cash outflows occur about 16 days earlier, on average, than do its operating cash inflows. Thus, if it wanted to finance this gap, Great Deal would need to borrow for approximately 16 days.

**Summary of Short-Term Liquidity Risk Analysis** The current and quick ratios measure liquidity at a particular date. Great Deal's current ratios are near the benchmark value of 1.0, while its quick ratios and operating cash flow to current liabilities ratios are lower than their benchmark values. Great Deal has been slower to collect its accounts receivable, with the days receivable increasing from 9.8 days in 2011 to 15.1 days in 2012. Great Deal has accelerated the sales of inventory, reducing its days inventory from 50.7 days in 2011 to 50.0 days in 2012. Finally, Great Deal financed an increasing proportion of its purchases by delaying payments to suppliers, as evidenced by an increase in days payable from about 49.8 days in 2011 to about 49.0 days in 2012. Taken as a whole, Great Deal's short-term liquidity risk appears low.

### ► PROBLEM 7.3 FOR SELF-STUDY

**Analyzing short-term liquidity risk.** Refer to the information for Markum Corporation in Exhibits 7.2 and 7.3.

- Calculate Markum's current ratio and quick ratio for 2013.
- Calculate Markum's working capital turnover ratios (accounts receivable turnover, inventory turnover and accounts payable turnover) for 2013.
- What was Markum's operating cycle (in days) for 2013?
- What is your assessment of the short-term liquidity risk of Markum Corporation at the end of 2013?

## MEASURES OF LONG-TERM LIQUIDITY RISK

Analysts use measures of **long-term liquidity risk** (also called *solvency risk*) to evaluate a firm's ability to meet interest and principal payments on long-term debt and similar obligations as they become due. If a firm cannot make the payments on time, it becomes insolvent and may have to reorganize or liquidate.

A firm's ability to generate income over several years provides the best protection against long-term liquidity risk. If a firm is profitable, it will either generate sufficient cash from operations or obtain needed financing from creditors and owners. Therefore, the measures of profitability discussed previously apply to assessing long-term liquidity risk as well. In addition, analysts measure long-term liquidity risk with debt ratios, the cash flow from operations to total liabilities ratio, and the interest coverage ratio.

**Debt Ratios** Several variations of debt ratios measure long-term liquidity risk. Because of these variations, the analyst should take care when comparing debt ratios among firms. In particular, the analyst should understand which debt ratio is being calculated and compared.

We use three debt ratios to measure long-term liquidity risk:

- Liabilities to Assets Ratio** = Total Liabilities/Total Assets
- Long-Term Debt Ratio** = Long-Term Debt/Total Assets
- Debt-Equity Ratio** = Long-Term Debt/Shareholders' Equity

The liabilities to assets ratio measures the portion of assets financed with liabilities. The long-term debt ratio measures the portion of assets financed with long-term debt. The debt-equity ratio measures financing obtained from long-term debt relative to shareholders' equity. In general, higher debt ratios mean greater long-term liquidity risk, that is, a greater likelihood that the firm will be unable to meet interest and principal payments in the future. Most firms must decide how much financial leverage, with its attendant risk, they can afford.

**Exhibit 7.7** shows these debt ratios for Great Deal for fiscal 2011 and 2012. Because the three debt ratios (and versions of them) correlate highly, analysts generally rely on one or two of these ratios to assess long-term liquidity risk.

**EXHIBIT 7.7****Great Deal, Inc.  
Debt Ratios****Liabilities to Assets Ratio**

2012: \$11,338/\$18,302 . . . . .	61.9
2011: \$10,670/\$15,826 . . . . .	67.4

**Long-Term Debt Ratio**

2012: \$1,104/\$18,302 . . . . .	6.0
2011: \$1,126/\$15,826 . . . . .	7.1

**Debt-Equity Ratio**

2012: \$1,104/\$6,964 . . . . .	15.9
2011: \$1,126/\$5,156 . . . . .	21.8

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The debt ratios for Great Deal show similar patterns between 2011 and 2012. All indicate that Great Deal's long-term liquidity risk decreased.

In assessing debt ratios, analysts customarily vary the benchmark in relation to the stability of the firm's earnings and cash flows from operations. The more stable the earnings and cash flows, the higher is the acceptable or safe debt ratio. Public utilities, for example, have high liabilities to assets ratios, frequently on the order of 60% to 70%. The stability of earnings and cash flows of public utilities makes these high ratios acceptable to many investors. These same investors might find such high leverage unacceptable for firms with less stable earnings and cash flows.

**Cash Flow from Operations to Total Liabilities Ratio** Debt ratios do not consider the availability of cash to service debt (that is, to pay interest and principal when due). The **cash flow from operations to total liabilities ratio** overcomes this deficiency. This cash flow ratio resembles the one for assessing short-term liquidity risk, but here the denominator includes all liabilities (both current and noncurrent). A mature, financially healthy company typically has a cash flow from operations to total liabilities ratio of 20% or more.

The cash flow from operations to total liabilities ratios for Great Deal are as follows:

Cash Flow from Operations to Total Liabilities Ratio	=	$\frac{\text{Cash Flow from Operations}}{\text{Average Total Liabilities}}$
2012: \$2,206/[0.5 × (\$10,670 + \$11,338)] . . . . .		20.0%
2011: \$1,877/[0.5 × (\$8,234 + \$10,670)] . . . . .		19.9%

Great Deal's cash flow from operations to total liabilities ratio was below the 20% benchmark in 2011 and reached this benchmark in 2012.

**Interest Coverage Ratio** Another measure of long-term liquidity risk is the number of times that income covers (pays for) interest charges. The **interest coverage ratio** equals income before interest expense and income tax expense divided by interest expense.<sup>8</sup> This ratio indicates the relative protection that operating profitability provides debt holders. Analysts typically view an interest coverage ratio below 3.0 as risky, although they prefer a ratio that is stable over time to one that is somewhat higher on average but fluctuates. A benchmark value of 3.0 means that the firm has three times as much income before interest expense and income taxes as it needs to pay current interest charges.

<sup>8</sup>If debt contracts require periodic repayments of principal, the denominator of the interest coverage ratio might include such required repayments.

Great Deal's interest coverage ratios for 2011 and 2012 are as follows:

Interest Coverage Ratio	= $\frac{\text{Net Income Before Interest and Income Taxes}}{\text{Interest Expense}}$
2012: $(\$2,195 + \$94)/\$94$ . . . . .	24.4 times
2011: $(\$1,700 + \$94)/\$94$ . . . . .	19.1 times

Great Deal's interest coverage ratios increased from 19.1 times in 2011 to 24.4 times in 2012. Because the interest coverage ratios easily exceed the 3.0 benchmark, we infer that Great Deal has profitability to cover its interest charges.

One can criticize the interest coverage ratio as a measure of long-term liquidity risk because it uses income rather than cash flows in the numerator. Firms pay interest and other fixed payment obligations with cash, not with income. When the ratio is relatively low, the analyst should use some measure of cash flows, such as cash flow from operations, in the numerator.

**Summary of Long-Term Liquidity Risk Analysis** Long-term liquidity analysis focuses on the amount of debt (particularly long-term debt) in the financing structure of a firm and on the adequacy of net income and cash flows to service this debt. Great Deal has a low fraction of assets financed by long-term debt, and its interest coverage ratios are strong. Both suggest that Great Deal's long-term liquidity risk is low.

#### ▶ PROBLEM 7.4 FOR SELF-STUDY

**Analyzing long-term liquidity risk.** Refer to the information for Markum Corporation in Exhibits 7.2 and 7.3.

- a. Calculate the three debt ratios for Markum for 2012 and 2013: liabilities to assets ratio, long term debt ratio, debt-equity ratio.
- b. Calculate the interest coverage ratio for 2012 and 2013.
- c. Did Markum's long-term liquidity risk improve or weaken between 2012 and 2013? What is your assessment of the long-term liquidity risk of Markum Corporation at the end of fiscal year 2013?

## LIMITATIONS OF RATIO ANALYSIS

Ratio analysis, as a tool for understanding the financial health of a firm, has limitations:

1. Because ratios use financial statement data as inputs, factors that cause shortcomings in financial statements will affect the ratios computed from them.
2. Changes in many ratios correlate with each other and thus do not provide independent insights. For example, the current ratio and the quick ratio often change proportionally and in the same direction. Typically, analysts would compute a subset of ratios to assess a particular dimension of profitability or risk.
3. When comparing ratios between periods for the same firm, the analyst must recognize changes in economic conditions, for example, changes in product lines or geographic markets served, changes in prices, or corporate acquisitions.
4. When comparing ratios of a particular firm with those of similar firms, the analyst must recognize differences among the firms, for example, different methods of accounting, different operating methods, and different types of financing.
5. Financial ratios alone do not indicate good or poor management; they indicate areas that the analyst should investigate further. For example, a decrease in inventory turnover

(ordinarily considered an undesirable trend) may reflect the accumulation of merchandise to keep retail stores fully stocked during a period of anticipated increased demand. The analyst must combine ratios with an investigation of other facts before drawing conclusions.

## COMMON-SIZE FINANCIAL STATEMENTS

Common-size financial statements, which show each item included on the statement as a percentage of some amount, are useful for analyzing a particular firm over time or for comparing firms of different sizes. As noted at the start of this chapter, **common-size balance sheets** express each balance sheet item as a percentage of total assets. **Common-size income statements** express each income statement item as a percentage of revenues. We previously discussed Great Deal's common-size income statements, shown in **Exhibit 7.5**. **Exhibit 7.8** shows Great Deal's common-size balance sheets for fiscal years 2010–2012.

**Exhibit 7.8** reveals that Great Deal's accounts receivable as a percentage of total assets is 11.04% for 2012. Is 11.0% high or low relative to other firms whose business models are similar to Great Deal's? Is Great Deal's common-size net property and equipment percentage of 22.24% in 2012 high or low? Comparing the items in Great Deal's common-size balance sheet to those of other firms in the same industry can provide insight into whether Great Deal is performing better, or worse, than its competition.

Comparing firms using common-size balance sheets assumes that the size or scale of a business does not affect the relation between a given balance sheet item and total assets. Similarly, comparing firms using common-size income statements assumes that the size or scale of a business does not affect the relation between a given income statement sheet item and total revenues. These assumptions may not hold. Large firms often achieve economies of scale that affect the proportionality of the components of their business, thus reducing the comparability of their common-size ratios with those of smaller-scale competitors. For example, a large purchaser of goods and services (such as Great Deal) has negotiating power over its suppliers, relative to the negotiating power of a smaller purchaser (such as a small local electronics store). Greater negotiating power means that Great Deal can obtain:

- **Lower per-unit prices.** Holding quantity constant, lower per-unit prices imply a lower per-unit recorded amount for inventory, which affects both inventory turnover and the cost of goods sold percentage.
- **More frequent but proportionately smaller quantities purchased.** Smaller but more frequent purchases reduce the quantity of inventory held by Great Deal, which improves inventory turnover.
- **Better payment terms.** Better terms increase the time that Great Deal retains cash as opposed to paying it to the supplier, thus improving its accounts payable turnover ratio.

A comparison of Great Deal's common-size financial statements with those of a smaller competitor, Consumers Electronics Limited (CEL), suggests that Great Deal has negotiating power. **Exhibit 7.9** shows CEL's common-size balance sheets for fiscal years 2010–2012 and **Exhibit 7.10** shows its common-size income statements for the same periods. CEL's financial information is presented in thousands of dollars, whereas Great Deal reports in millions of dollars. CEL is, therefore, substantially smaller than Great Deal. To discern the influence of negotiating power, we note that Great Deal has smaller common-size percentages for inventory and larger common-size percentages for accounts payable than CEL. Typically, analysts would not compare the common-size balance sheets of two firms that differ significantly in size. For example, an informed user would not compare Great Deal's common-size balance sheet with the common-size balance sheet of a local electronics shop.

### ANALYZING FIRM PERFORMANCE USING FINANCIAL RATIOS

As discussed earlier in this chapter, two common approaches to evaluating whether a firm has done well or poorly during a given accounting period involve comparing that firm to:

1. Its own performance, in an earlier time period.
2. Other firms' performance, over the same time period as performance is measured.

**EXHIBIT 7.8**

**Great Deal, Inc.**  
**Common-Size Balance Sheets**  
**For Years 2012, 2011, and 2010**  
**(amounts in millions of US\$)**

	2012*		2011		2010	
<b>Assets</b>						
Current Assets						
Cash and Cash Equivalents	\$ 1,826	9.98%	\$ 498	3.2%	\$ 1,438	11.3%
Short-Term Investments	90	0.49%	11	0.1%	64	0.5%
Receivables	2,020	11.04%	1,868	11.8%	549	4.3%
Merchandise Inventories	5,486	29.97%	4,753	30.0%	4,708	36.9%
Other Current Assets	1,144	6.25%	1,062	6.7%	583	4.6%
Total Current Assets	\$10,566	57.73%	\$ 8,192	51.8%	\$ 7,342	57.6%
Property and Equipment						
Land and Buildings	\$ 757	4.14%	\$ 755	4.8%	\$ 732	5.7%
Leasehold Improvements	2,154	11.77%	2,013	12.7%	1,752	13.7%
Fixtures and Equipment	4,447	24.30%	4,060	25.7%	3,057	24.0%
Property Under Capital Lease	95	0.52%	112	0.7%	67	0.5%
	\$ 7,453	40.72%	\$ 6,940	43.9%	\$ 5,608	43.9%
Less: Accumulated Depreciation	3,383	18.48%	2,766	17.5%	2,302	18.0%
Net Property and Equipment	\$ 4,070	22.24%	\$ 4,174	26.4%	\$ 3,306	26.0%
Goodwill	2,452	13.40%	2,203	13.9%	1,088	8.5%
Trade Names	159	0.87%	173	1.1%	97	0.8%
Customer Relationships	279	1.52%	322	2.0%	5	0.0%
Equity and Other Investments	324	1.77%	395	2.5%	605	4.7%
Other Assets	452	2.47%	367	2.3%	315	2.5%
Total Assets	\$18,302	100.00%	\$15,826	100.0%	\$12,758	99.9%
<b>Liabilities and Shareholders' Equity</b>						
Current Liabilities						
Accounts Payable	\$ 5,276	28.83%	\$ 4,997	31.6%	\$ 4,297	33.7%
Unredeemed Gift Card Liabilities	463	2.53%	479	3.0%	531	4.2%
Accrued Compensation and Related Expenses	544	2.97%	459	2.9%	373	2.9%
Accrued Liabilities	1,681	9.18%	1,382	8.7%	975	7.6%
Accrued Income Taxes	316	1.73%	281	1.8%	404	3.2%
Short-Term Debt	663	3.62%	783	4.9%	156	1.2%
Current Portion of Long-Term Debt	35	0.19%	54	0.3%	33	0.3%
Total Current Liabilities	\$ 8,978	49.05%	\$ 8,435	53.3%	\$ 6,769	53.1%
Long-Term Liabilities	1,256	6.86%	1,109	7.0%	838	6.6%
Long-Term Debt	1,104	6.03%	1,126	7.1%	627	4.9%
Commitments and Contingencies						
Shareholders' Equity						
Preferred Stock	0	0.00%	0	0.0%	0	0.0%
Common Stock	42	0.23%	41	0.3%	41	0.3%
Additional Paid-in Capital	441	2.41%	205	1.3%	8	0.1%
Retained Earnings	5,797	31.67%	4,714	29.8%	3,933	30.8%
Accumulated Other Comprehensive Income	40	0.22%	(317)	-2.0%	502	3.9%
Total Great Deal Shareholders' Equity	\$ 6,320	34.53%	\$ 4,643	29.4%	\$ 4,484	35.1%
Noncontrolling Interests	644	3.52%	513	3.2%	40	0.3%
Total Shareholders' Equity	\$ 6,964	38.05%	\$ 5,156	32.6%	\$ 4,524	35.4%
Total Liabilities and Shareholders' Equity	\$18,302	99.99%	\$15,826	99.9%	\$12,758	100.1%

\*2012 percentages shown to two digits for later use in creating pro forma statements.

**EXHIBIT 7.9**

**Consumers Electronics Limited**  
**Common-Size Balance Sheets**  
**For Years 2012, 2011, and 2010**  
**(amounts in thousands of US\$)**

	2012		2011		2010	
<b>Assets</b>						
Cash and Cash Equivalents . . . . .	\$ 612	5.0%	\$ 451	4.2%	\$ 406	4.8%
Receivables . . . . .	1,512	12.5%	1,417	13.1%	1,350	16.0%
Merchandise Inventories . . . . .	3,567	29.4%	3,984	36.9%	2,910	34.4%
Other Current Assets . . . . .	301	2.5%	721	6.7%	456	5.4%
Total Current Assets . . . . .	\$ 5,992	49.4%	\$ 6,573	60.9%	\$5,122	60.6%
Land . . . . .	697	5.7%	546	5.1%	401	4.7%
Buildings and Equipment, net of depreciation . . . . .	5,454	44.9%	3,678	34.1%	2,929	34.7%
Total Property and Equipment . . . . .	6,151	50.6%	4,224	39.1%	3,330	39.4%
Total Assets . . . . .	<u>\$12,143</u>	<u>100.0%</u>	<u>\$10,797</u>	<u>100.0%</u>	<u>\$8,452</u>	<u>100.0%</u>
<b>Liabilities and Shareholders' Equity</b>						
Accounts Payable . . . . .	\$ 1,040	8.6%	\$ 1,066	9.9%	\$ 906	10.7%
Notes Payable . . . . .	2,015	16.6%	1,814	16.8%	1,524	18.0%
Other Current Liabilities . . . . .	584	4.8%	816	7.6%	410	4.9%
Total Current Liabilities . . . . .	\$ 3,639	30.0%	\$ 3,696	34.3%	\$2,840	33.6%
Long-Term Debt . . . . .	1,741	14.3%	1,724	16.0%	1,243	14.7%
Shareholders' Equity:						
Common Stock . . . . .	\$ 25	0.2%	\$ 25	0.2%	\$ 20	0.2%
Additional Paid-In Capital . . . . .	1,653	13.6%	1,750	16.2%	1,649	19.5%
Retained Earnings . . . . .	5,085	41.9%	3,602	33.4%	2,700	31.9%
Total Shareholders' Equity . . . . .	\$ 6,763	55.7%	\$ 5,377	49.8%	\$4,369	51.6%
Total Liabilities and Shareholders' Equity . . . . .	<u>\$12,143</u>	<u>100.0%</u>	<u>\$10,797</u>	<u>100.0%</u>	<u>\$8,452</u>	<u>100.0%</u>

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**EXHIBIT 7.10**

**Consumers Electronics Limited**  
**Common-Size Income Statements**  
**For Years 2012, 2011, and 2010**  
**(amounts in thousands of US\$)**

	2012		2011		2010	
Revenue . . . . .	\$25,675	100.0%	\$23,542	100.0%	\$19,120	100.0%
Cost of Goods Sold . . . . .	17,765	69.2%	16,713	71.0%	13,711	71.7%
Gross Profit . . . . .	\$ 7,910	30.8%	\$ 6,829	29.0%	\$ 5,409	28.3%
Selling, General, and Administrative Expenses . . . . .	5,681	22.1%	5,412	23.0%	4,162	21.8%
Restructuring Charges . . . . .	0	0.0%	13	0.1%	4	0.0%
Operating Income . . . . .	\$ 2,229	8.7%	\$ 1,404	5.9%	\$ 1,243	6.5%
Investment Income . . . . .	12	0.0%	16	0.1%	8	0.0%
Interest Expense . . . . .	(123)	-0.5%	(131)	-0.6%	(27)	-0.1%
Income Before Income Tax Expense . . . . .	\$ 2,118	8.2%	\$ 1,289	5.5%	\$ 1,224	6.4%
Income Tax Expense . . . . .	635	2.5%	387	1.6%	367	1.9%
Net Income . . . . .	<u>\$ 1,483</u>	<u>5.7%</u>	<u>\$ 902</u>	<u>3.9%</u>	<u>\$ 857</u>	<u>4.5%</u>

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The first approach is called **time-series analysis** and involves the over-time comparison of the firm's financial ratios. The second approach is called **cross-section analysis** and involves comparing the financial ratios of the firm being analyzed with the financial ratios of one or more other firms, for the same time period. Firms selected for comparison in a cross-section analysis share common business elements with the firm being analyzed. Common business elements that would be used to select comparison firms include: industry membership, size, business strategy, and degree of geographic or product diversification. We illustrate both a time-series analysis of financial ratios and a cross-sectional analysis of financial ratios for Great Deal.

**Illustration of Time-Series Analysis of Financial Ratios** Exhibit 7.5 shows that Great Deal's gross profit percentage (= gross profit divided by sales) increased over time, from 23.9% in 2010, to 24.4% for 2011, to 24.5% in 2012. The increasing gross profit percentage results from the decreasing cost of goods sold percentage (from 76.1% in 2010, to 75.6% in 2011, to 75.5% in 2012).

Sales increased each year, 2010–2012. The year-to-year sales increase, combined with the decrease in cost of goods sold as a percentage of sales, suggests that Great Deal experienced some combination of pricing advantages, purchasing advantages, or changes in sales mix to higher margin products. That is, cost of goods sold did not increase proportionally with sales; rather, it increased at a rate smaller than the sales increase. Regardless of the underlying causes, sales increases coupled with less-than-proportional increases in cost of goods sold explain the decline in this expense percentage.

Great Deal experienced a decrease in its operating income percentage (= operating income divided by sales) from 5.4% to 4.2% between 2010 and 2011, and an increase between 2011 and 2012, from 4.2% to 4.5%. The decrease between 2010 and 2011 resulted from a combination of three factors:

1. A decreasing cost of goods sold to sales percentage.
2. An increasing selling, general, and administrative (SG&A) expense to sales percentage.
3. An increasing percentage of one-time charges (restructuring charges and asset impairments).

As discussed earlier in this chapter, the increase in profitability between 2011 and 2012 resulted from a combination of three factors:

1. A further decrease in the cost of goods sold to sales percentage.
2. A decreasing SG&A expense to sales percentage.
3. A decreasing percentage of one-time charges.

The analyst would need to identify the reasons for these changes over time when analyzing Great Deal's profitability.

**Illustration of Cross-Section Analysis of Financial Ratios** We illustrate a cross-section analysis of Great Deal's financial ratios by examining the financial ratios for a Great Deal competitor, Consumers Electronics Limited, or CEL. Exhibit 7.9 contains CEL's common-size balance sheet, and Exhibit 7.10 contains its common-size income statement for fiscal years 2010–2012.

A cross-section analysis compares Great Deal to other retailers, preferably other retailers whose products and services are similar to those offered by Great Deal. Comparing financial ratios of retailers with ratios of non-retailers makes little sense. The non-comparability results from the different business models—different types of assets and different financial structures—that distinguish Great Deal from companies such as Boeing, an aircraft manufacturer, McDonald's, a fast-food retailer, or Colgate Palmolive, a consumer products manufacturer. Differences in business models and their implementations create across-firm differences in risk and performance, which in turn affect the results reported in financial statements. We compare Great Deal to a single competitor (CEL). An alternative approach would compare Great Deal to several similar firms. Regardless of the choice, the objective is to hold constant the effects of business models by identifying a competitor (or competitors), using industry classification and other factors to determine similarity.

We turn now to CEL's and Great Deal's common-size income statements. CEL's profit margin percentage, 5.7% for 2012 (the ratio of net income to sales revenue), is about 2.2 times Great Deal's profit margin ratio of 2.7% for the same fiscal year. Inspection of the components



of the two income statements reveals that CEL's higher profit margin percentage derives from a lower cost of sales percentage (69.2% in fiscal 2012 versus 75.5% for Great Deal), and a higher ratio of selling, general, and administrative percentage (22.1% in 2012 versus 19.9% for Great Deal). The higher cost of sales percentage for Great Deal is consistent with the fact that Great Deal is a large mass marketer; it will have a higher (compared to the smaller and local CEL) cost of goods sold percentage due to competition and aggressive pricing. Great Deal will, however, recognize economies of scale on its SG&A costs, as evidenced by Great Deal's lower (relative to CEL) SG&A costs as a percentage of sales.

It is important to note that our analysis assumes Great Deal and CEL classify, label, and aggregate information similarly. For example, we assume Great Deal and CEL include store occupancy costs in the same lines of their respective income statements. This may not be the case. Moreover, firms do not typically disclose enough disaggregated information to adjust the financial statements. Usually the analyst can find a level of aggregation of the available data into broader categories that include similar cost items. For example, the analyst can calculate and compare the operating income to sales revenue percentages of the two firms. This comparison is appropriate as long as the analyst has identified all operating expenses of the two firms. In fiscal 2012, Great Deal's operating income to sales percentage is 4.5%, compared to 8.7% for CEL.

Even for otherwise similar firms, income statement formats may be so non-comparable as to preclude any comparisons of line items and subtotals. In such cases the only appropriate comparison is based on the profit margin percentages. This is because, by definition, net income is comparable across all firms that report under the same accounting standards. Furthermore, because net income aggregates all items on the income statement, it is unaffected by differences in format, presentation, labeling, and aggregation of income statement items. For these reasons, the profit margin percentage (the ratio of net income to sales revenue) is a widely used ratio in evaluating and comparing operating performance of similar firms. Profit margin percentages are not comparable for firms with different business models.

## SUMMARY

**Exhibit 7.11** summarizes the calculation of the financial statement ratios discussed in this chapter.

This chapter began with the question of whether to invest in a certificate of deposit or in the shares of Great Deal. Analysis of Great Deal's financial statements indicates that it is a growing, profitable company with few indications of either short-term or long-term liquidity problems. An investor would need at least three additional inputs before making the investment decision. The first is information other than the financial statements to aid in understanding the firm's future profitability and risk. Such information might include articles in the financial press, the firm's statements about its spending plans for long-term assets, analysts' beliefs about spending needs, and strategies of competitors. Second, the investor should understand his or her willingness to assume risk. Third, the investor must decide if the current price of the shares makes them an attractive purchase.<sup>9</sup> Before making buy/sell recommendations to investors, analysts compare their assessments of the firm's profitability and risk to the firm's share price. Analysts might recommend the purchase of shares of a poorly run company whose shares they judge underpriced rather than recommend shares of a well-run company whose shares they judge overpriced. At this stage in the investment decision, the analysis requires intuition, judgment, and experience.

<sup>9</sup>Finance texts discuss other factors in the investment decision. Perhaps the most important of these is how a particular investment fits in with the investor's entire portfolio. Modern research suggests that the suitability of a potential investment depends more on the attributes of the other components of an investment portfolio and the risk attitude of the investor than it does on the attributes of the potential investment itself.

**EXHIBIT 7.11** Summary of Financial Statement Ratios

Ratio	Numerator	Denominator
<b>Profitability Ratios</b>		
Return on Equity (ROE) . . . . .	Net Income	Average Shareholders' Equity During the Period
Return on Assets (ROA) . . . . .	Net Income	Average Total Assets During the Period
Return on Assets, adjusted for financing . . . . .	Net Income + Interest Expense (net of tax effects)	Average Total Assets During the Period
Profit Margin . . . . .	Net Income	Sales
Various Expense Ratios . . . . .	Various Expenses	Sales
Asset Turnover Ratio (Total Assets Turnover) . . . . .	Sales	Average Total Assets During the Period
Accounts Receivable Turnover Ratio . . . . .	Sales	Average Accounts Receivable During the Period
Inventory Turnover Ratio . . . . .	Cost of Goods Sold	Average Inventory During the Period
Fixed-Asset Turnover Ratio . . . . .	Sales	Average Fixed Assets During the Period
Financial Leverage Ratio . . . . .	Average Total Assets During the Period	Average Shareholders' Equity During the Period
<b>Short-Term Liquidity Risk Ratios</b>		
Current Ratio . . . . .	Current Assets	Current Liabilities
Quick or Acid Test Ratio . . . . .	Highly Liquid Assets (cash, marketable securities, and accounts receivable) <sup>a</sup>	Current Liabilities
Cash Flow from Operations to Current Liabilities Ratio . . . . .	Cash Flow from Operations	Average Current Liabilities During the Period
Accounts Payable Turnover Ratio . . . . .	Purchases <sup>b</sup>	Average Accounts Payable During the Period
Days Accounts Receivable Outstanding . . . . .	365 days	Accounts Receivable Turnover Ratio
Days Inventories Held . . . . .	365 days	Inventory Turnover Ratio
Days Accounts Payable Outstanding . . . . .	365 days	Accounts Payable Turnover Ratio
<b>Long-Term Liquidity Ratios</b>		
Liabilities to Assets Ratio . . . . .	Liabilities	Assets
Long-Term Debt Ratio . . . . .	Long-Term Debt	Assets
Debt–Equity Ratio . . . . .	Long-Term Debt	Shareholders' Equity
Cash Flow from Operations to Total Liabilities Ratio . . . . .	Cash Flow from Operations	Average Total Liabilities During the Period
Interest Coverage Ratio . . . . .	Income Before Interest and Income Taxes	Interest Expense

<sup>a</sup>The calculation could exclude receivables for some firms and include inventories for others.

<sup>b</sup>Purchases = Cost of Goods Sold + Ending Inventories – Beginning Inventories.

**PROBLEM 7.5 FOR SELF-STUDY**

**Computing profitability and risk ratios.** Using the information from Consumer Electronics Limited's balance sheet (**Exhibit 7.9**) and income statement (**Exhibit 7.10**), compute the following ratios for fiscal 2012:

- a. Return on equity (ROE).
- b. Return on assets (ROA).
- c. Financial leverage ratio.
- d. Profit margin ratio.
- e. Cost of goods sold percentage.
- f. SG&A percentage.
- g. Asset turnover ratio.
- h. Accounts receivable turnover ratio.
- i. Inventory turnover ratio.
- j. Fixed-asset turnover ratio.
- k. Current ratio.
- l. Quick ratio.
- m. Accounts payable turnover ratio.
- n. Operating cycle.
- o. Liabilities to assets ratio.
- p. Long-term debt ratio.
- q. Debt-equity ratio.
- r. Interest coverage ratio.

## APPENDIX 7.1: PRO FORMA FINANCIAL STATEMENTS

Accountants use the term **pro forma financial statements** to refer to financial statements prepared under a particular set of assumptions. One set of assumptions might be that some transactions, actually reported in the firm's income statement for the year, had not occurred. Such assumed-away transactions might include unusual or nonrecurring revenues, expenses, gains, and losses. In these cases, firms report pro forma earnings to indicate to financial statement users what the firm views as normal, recurring earnings.

The more traditional use of the term pro forma financial statements refers to projected financial statements based on assumptions about the future. One set of assumptions might be that historical patterns (for example, growth rates or rates of return) will continue. Alternatively, the pro forma financial statements might reflect new assumptions about growth rates, debt levels, profitability, and so on. For example, a firm might project future sales, net income, assets, and cash flows to ascertain whether operations will generate sufficient cash flows to finance expenditures on long-term assets. A firm might change its product lines or pricing policies and wish to estimate the impact on rates of return. A firm might project future financial statement amounts for an acquisition target to ascertain the price it should pay.

This appendix describes and illustrates procedures for preparing pro forma (projected) financial statements and illustrates how to use them. In your exposure to managerial and cost accounting concepts, you will encounter the notion of a budget. A budget for an entire firm means the same thing as pro forma (projected) financial statements except that the statements projected typically have different uses and formats. Managers and analysts use pro forma financials and budgets for differing reasons, but use similar procedures to prepare them.

## PREPARING PRO FORMA FINANCIAL STATEMENTS

The preparation of pro forma financial statements requires assumptions about the future. The usefulness of the pro forma financial statements depends on the reasonableness of those assumptions. Various spreadsheet programs ease the calculations required to prepare these statements, but the warning “garbage-in, garbage-out” certainly applies—the results will have quality and validity no better than the input assumptions. Careful analysts organize a list of all assumptions, preferably in a single section of the spreadsheet. Well-prepared pro forma statements allow the analyst to vary critical assumptions to see how the results vary.

The preparation of pro forma financial statements typically begins with the income statement, followed by the balance sheet and then the statement of cash flows. The level of operating activity usually dictates the required amount of assets, which in turn affects the required level of financing. Amounts for the statement of cash flows come directly from the pro forma income statement and comparative balance sheets.

We adhere to the following steps in preparing pro forma financial statements:

1. Project operating revenues.
2. Project operating expenses other than the cost of financing and income taxes.
3. Project the assets required to support the level of projected operating activity.
4. Project the financing (liabilities and contributed capital) required to fund the level of assets in step 3.
5. Project the cost of financing the debt projected in step 4, income tax expense, net income, dividends, and the change in retained earnings.
6. Project the statement of cash flows from amounts on the projected balance sheet and income statement.

**Exhibit 7.12** summarizes these six steps. To illustrate the preparation of pro forma financial statements, we use the data for Great Deal discussed previously in this chapter. We project its financial statements for fiscal 2013.

### STEP 1: PROJECT OPERATING REVENUES

The projections begin with sales revenues. The analyst studies the historical pattern of changes in sales and assesses whether this pattern will continue. Among the questions raised are the following:

1. Does the firm plan to change product lines or pricing policies, make acquisitions of other companies, or take other actions that would alter the historical sales pattern?
2. Does the firm expect competitors to alter their strategies or new competitors to enter the market and thereby change market shares?
3. Will conditions in the economy affect the firm’s sales? For example, do the firm’s sales fluctuate with economic cycles, do they remain steady, or do they fluctuate with other variables, such as local population growth?

The assumption about sales revenues drives most other items in the pro forma financial statements, which normally makes this the most important assumption.

**Exhibit 7.5** indicates that sales revenues for Great Deal increased from \$40,023 to \$45,015 between 2010 and 2011, a growth rate of 12.5% [=  $(\$45,015 / \$40,023) - 1$ ]. Sales increased from \$45,015 to \$49,694 between 2011 and 2012, a growth rate of 10.4% [=  $(\$49,694 / \$45,015) - 1$ ]. The decline in the growth rate occurred in a year when Great Deal made no large corporate acquisitions and the economy grew slowly. We assume that economic conditions will slightly weaken in 2013, and project Great Deal’s revenues to increase 10% between 2012 and 2013. Thus, projected sales for 2013 are \$54,663 (=  $\$49,694 \times 1.10$ ).

### STEP 2: PROJECT OPERATING EXPENSES

Projecting operating expenses requires understanding the behavior of various operating costs. Among the question that an analyst raises are the following:

1. Does the expense item tend to vary with the level of sales, a behavior pattern characterized as a variable cost? Alternatively, does the expense item tend to remain relatively constant for a particular time period regardless of the level of sales, a behavior pattern characterized

**EXHIBIT 7.12** Preparing Pro Forma Financial Statements

Statement of Income and Retained Earnings		Balance Sheet	
<b>STEP 1: Project Operating Revenues</b>		<b>STEP 3: Project Assets</b>	
Sales Revenue		Cash	
Other Revenues		Accounts Receivable	
		Inventories	
		Other Current Assets	
		Investments	
		Fixed Assets	
		Other Assets	
<b>STEP 2: Project Operating Expenses</b>			
Cost of Goods Sold			
Selling and Administrative Expenses			
Net Income Before Interest Expense and Income Taxes			
<b>STEP 5: Project Cost of Financing, Income Tax Expense, and the Change in Retained Earnings</b>			
Interest Expense			
Income Tax Expense			
Net Income			
Dividends			
Change in Retained Earnings			
		<b>STEP 4: Project Liabilities and Contributed Capital</b>	
		Accounts Payable	
		Notes Payable	
		Other Current Liabilities	
		Long-Term Debt	
		Other Liabilities	
		Contributed Capital	
		<b>STEP 5: Project Retained Earnings</b>	
		Retained Earnings	
<b>Statement of Cash Flows</b>			
<b>STEP 6: Project the Statement of Cash Flows</b>			
<b>Operations</b>	<b>Investing</b>	<b>Financing</b>	
Net Income	Acquisition of Fixed Assets	Change in Notes Payable	
Depreciation	Sale of Investments	Change in Long-Term Debt	
Other Adjustments	Acquisition of Investments	Change in Common Stock	
Change in Receivables	Other Investing Transactions	Dividends	
Change in Inventories		Other Financing Transactions	
Change in Other Current Assets			
Change in Accounts Payable			
Change in Other Current Liabilities			
<b>CASH FLOW FROM OPERATIONS</b>	<b>CASH FLOW FROM INVESTING</b>	<b>CASH FLOW FROM FINANCING</b>	

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as a fixed cost? When you study cost behavior in managerial accounting and economics courses, you will learn that nearly all costs vary in the long run, but some appear fixed in the short run. Deciding on whether a given cost is fixed or variable requires knowing the time period of the projection.

- Does the expense item have both variable- and fixed-cost characteristics, a pattern described as a mixed cost or a step cost?
- Does the firm have some discretion to change the amount of a fixed-cost item in the short term in response to current conditions (for example, maintenance or advertising expenditures)? Or, is there little discretion to change a fixed cost (for example, depreciation on equipment)?

Understanding the behavior of each expense item aids in projecting its amount.

**Exhibit 7.5** presents common-size income statements for Great Deal for fiscal years 2010, 2011, and 2012. We use these common-size percentages in projecting operating expenses.

**Cost of Goods Sold** Great Deal purchases merchandise for sale to customers. Thus cost of goods sold will vary with sales. Great Deal's cost of goods sold percentage decreased from 76.1% in 2010 to 75.6% in 2011, and to 75.5% in 2012. Assume that the decrease is a result of implementing inventory control systems in their retail stores, and that Great Deal will benefit even further from these control systems in 2013, reducing the cost of goods sold to sales percentage to 75.2%. Projected cost of goods sold for 2013 is \$41,107 (= 0.752 × \$54,663) million.

**Selling and Administrative Expense** The ratio of selling and administrative expense to sales increased from 18.5% in 2010 to 20.0% in 2011, and declined to 19.9% in 2013. We project that selling and administrative expenses will equal 19.5% of sales in 2013. Projected selling and administrative expenses for 2013 are \$10,659 ( $= 0.195 \times \$54,663$ ) million.

**Other Operating Expenses** Firms may report other operating expenses on their income statements, some of which are recurring, some of which are not. An example of a common recurring other operating expense is research and development (R&D) expense. An example of a common non-recurring operating expense is a restructuring charge. Great Deal does not have R&D expense, so we do not forecast any recurring operating expenses (other than cost of goods sold and SG&A). Great Deal does report restructuring charges and impairments, but not consistently across all years. We assume that Great Deal will have no restructuring charges and no asset impairments in 2013.

**Non-Operating Expenses** The remaining items on Great Deal's income statement relate to other income and other expenses (losses). Other income typically consists of one-time gains from sales of assets and income earned on investments. Other expenses (losses) consist of one-time losses from asset sales or asset impairments, financing charges (interest expense) and income taxes. We assume that Great Deal will have no one-time gains or losses in 2013, and that it will have \$50 million of investment income. Based on recent borrowings, we assume Great Deal pays interest charges at the rate of 6% annually. Finally, we assume Great Deal faces an income tax rate of 36%. We delay projecting the amounts of interest expense until we project the amount of debt, and we wait to project income taxes until we know Great Deal's projected earnings before taxes.

The remaining items on Great Deal's income statement relate to equity in income (loss) of affiliates and to the amount of earnings attributable to noncontrolling interests.<sup>10</sup> Briefly, equity in income (loss) of affiliates pertains to Great Deal's pro rata share of the earnings, or losses, of companies in which it has ownership interests between 20% and 50%. In fiscal 2012, these earnings were \$1 million. For fiscal 2013, earnings from affiliates are projected to be \$3 million.

Net earnings attributable to noncontrolling interests pertains to the portion of Great Deal's earnings which are attributable to the residual ownership stakes in companies where Great Deal has a controlling, or majority, ownership. For example, if Great Deal owns 90% of another company, the noncontrolling or residual ownership interest is 10%. The projected amount of earnings attributable to noncontrolling interests for fiscal 2013 is \$100 million.

### STEP 3: PROJECT ASSETS

The projection of total assets on the balance sheet requires assumptions that are consistent with those underlying the pro forma income statement. One approach assumes a total assets turnover (that is, sales/average total assets) similar to that of previous years. For example, Great Deal's total assets turnover was 3.0 in 2010, 3.2 in 2011, and 2.9 in 2012. Assuming Great Deal targets a 2.8 total assets turnover ratio for 2013, we can calculate its projected total assets at the end of 2013 by solving the following equation:

$$\text{Total Assets Turnover} = \frac{\text{Sales}}{\text{Average Total Assets}} = \frac{\$54,663}{0.5 \times (18,302 + X)} = 2.8$$

Solving for the unknown in the equation ( $X$ , equal to total assets at the end of fiscal 2013) yields projected total assets at the end of 2013 of \$20,743 million. The analyst can then use common-size balance sheet percentages to allocate this total to individual balance sheet accounts. We use this approach in projecting specific asset balances for Great Deal.

An alternative approach uses the historical annual growth rate in total assets of 11% during the last three years ( $=$  the average of  $-6\%$  growth in 2010,  $24\%$  growth in 2011 and  $16\%$  growth in 2012). This approach yields total assets of \$20,315 ( $= \$18,302 \times 1.11$ ) million. The analyst can apply common-size balance sheet percentages to allocate \$20,315 million to individual balance sheet items. A third approach uses a mixture of asset turnovers and growth rates for the various assets and then aggregates projected amounts for individual assets to compute total assets.

<sup>10</sup>Chapter 14 describes equity investments in affiliates as well as noncontrolling interests.

**Cash** We assume Great Deal's 2013 common-size percentage for cash (10.0% of total assets) reflects the amount of cash it needs to maintain for operations. Projected cash and cash equivalents for 2013 is \$2,070 ( $= \$20,743 \times 9.98\%$ ) million.

If other forecasts indicate that Great Deal will have more cash than \$2,070 million, we assume Great Deal will pay the difference as dividends to its shareholders. If the forecasts reveal that Great Deal will need cash, we assume it will issue (sell) shares of common stock. These assumptions indicate how Great Deal will use extra cash if available, or generate extra cash if needed. Preparing pro forma financial statements requires the preparer to know how the firm will respond to having more cash than needed or a shortfall of cash.

**Short-Term Investments** Short-term investments reflect cash Great Deal has used to purchase debt and equity securities issued by other entities. Using the common-size percentage for 2012, we project an ending balance of short-term investments for 2013 of \$102 ( $= \$20,743 \times 0.49\%$ ) million.

**Accounts Receivable** For most firms, accounts receivable vary with sales. Great Deal's common-size balance sheet shows that accounts receivable as a percentage of total assets declined from 11.8% in 2011 to 11% in 2012. We assume accounts receivable will maintain at the 2012 percentage of 11.0% of assets. Projected accounts receivable for 2013 are \$2,290 ( $= \$20,743 \times 11.04\%$ ) million.

**Inventory** Merchandise inventories were 36.9% of total assets in 2010 and declined to 30.0% in 2011 and 2012. We assume the inventory to total assets percentage will stay at 30.0% in 2013. Projected merchandise inventory is \$6,216 ( $= \$20,743 \times 29.97\%$ ) million.

**Other Current Assets** Great Deal's common-size balance sheets show that other current assets were 4.6%, 6.7%, and 6.3% of total assets in 2010, 2011 and 2012, respectively. We assume other current assets will remain at 6.3% in 2013. Thus, other current assets at the end of 2013 are \$1,296 ( $= \$20,743 \times 6.25\%$ ) million (rounded up for statement).

**Property, Plant, and Equipment** We assume that Great Deal projects gross property, plant, and equipment (PPE), accumulated depreciation, and net PPE, at the 2012 common-size percentages of 40.7% (gross PPE), 18.5% (accumulated depreciation), and 22.2% (net PPE). The projected balances for these balance sheet items are \$8,447 ( $= \$20,743 \times 40.72\%$ ) million for gross PPE, \$3,833 ( $= \$20,743 \times 18.48\%$ ) million for accumulated depreciation, and \$4,614 ( $= \$8,447 - \$3,833$ ) million for net PPE.

We further assume that Great Deal had no disposals or impairments of property and equipment in 2010. Thus, the only transaction affecting Great Deal's gross property and equipment will be purchases of property, plant, and equipment (capital expenditures), and the only transaction affecting accumulated depreciation will be its periodic depreciation charge (depreciation expense). As **Chapter 10** describes in detail, there are several other transactions that affect the property, plant, and equipment account. These transactions would be taken into account in preparing a more complex set of pro forma financial statements.

**Intangible Assets** Great Deal's intangible assets consist of goodwill (13.40% of total assets in fiscal 2012), trade names (0.87% of total assets), and customer relationships (1.52% of total assets). We assume the amounts of these balance sheet accounts will remain at their 2012 common-size percentages for 2013. Thus, the projected amounts for intangible assets for 2013 are: \$2,780 ( $= \$20,743 \times 13.40\%$ ) million for goodwill, \$180 ( $= \$20,743 \times 0.87\%$ ) million for trade names, and \$315 ( $= \$20,743 \times 1.52\%$ ) million for customer relationships.

**Equity and Other Investments** Equity and other investments relate primarily to Great Deal's ownership of the common shares of other firms. We assume Great Deal maintains equity and other investments at the 2012 common-size percentage of 1.8%. Thus, the projected amount for this balance sheet item is \$367 ( $= \$20,743 \times 1.77\%$ ) million.

**Other Assets** Other assets likely reflects a number of assets that are aggregated for convenience in one account. We assume that Great Deal maintains other assets at the 2012 common-size percentage of 2.47% of total assets. The projected amount for other assets for 2013 is \$512 ( $= \$20,743 \times 2.47\%$ ) million.

#### STEP 4: PROJECT LIABILITIES AND CONTRIBUTED CAPITAL

We project next the financing side of the balance sheet. The projection of liabilities and contributed capital flows directly from the projection of the level of operating activity estimated in steps 1 and 2 and the projection of total assets in step 3.

**Accounts Payable** As a percentage of total assets, Great Deal's accounts payable were 28.83% in fiscal 2012. We assume the same percentage for fiscal 2013. Projected accounts payable for 2013 are \$5,980 ( $= \$20,743 \times 28.83\%$ ) million.

**Other Current Liabilities** Great Deal reports a number of other current liabilities, including unredeemed gift cards, accrued compensation, accrued liabilities, accrued income taxes, short-term debt, and the current portion of long-term debt. For simplicity, we assume that the amounts in these accounts at the end of 2013 approximate their 2012 common-size percentages.<sup>11</sup> Applying these percentages to the projected amount of total assets of \$20,743 yields the following amounts for these items:

Current Liability	Calculation	Projected Amount, End of Fiscal 2013
Unredeemed Gift Card Liabilities	$\$20,743 \times 2.53\%$	\$ 525
Accrued Compensation	$\$20,743 \times 2.97\%$	616
Accrued Liabilities	$\$20,743 \times 9.18\%$	1,904
Accrued Income Taxes	$\$20,743 \times 1.73\%$	359
Short-Term Debt	$\$20,743 \times 3.62\%$	751
Current Portion of Long-Term Debt	$\$20,743 \times 0.19\%$	39

**Long-Term Liabilities** Great Deal's long-term liabilities include liabilities that extend beyond one year and are related to operations (as opposed to financing). This account includes retirement liabilities and deferred taxes. For simplicity, we project these liabilities using their 2012 common-size percentages. For fiscal 2013, the projected amount of long-term liabilities is \$1,423 ( $= \$20,743 \times 6.86\%$ ) million.

**Long-Term Debt** This account reflects Great Deal's borrowings that are due beyond one year. The portion due within one year is included in the current portion of the long-term debt account, a current liability. Typically, the amount of long-term debt would reflect the firm's cash needs and would be calculated after other cash inflows and outflows are determined. Determining the amount of debt financing in this way requires an iterative process to "solving" the pro forma financial statements. Given the complexity of the iterative process, we use a simpler approach to illustrate the creation of projected financial statements. Specifically, we follow the prior assumption of using the common-size percentage from 2012 to project long-term debt for fiscal 2013. Projected long-term debt at the end of 2013 is \$1,251 ( $= \$20,743 \times 6.03\%$ ) million.

**Preferred Stock** Great Deal has no preferred stock in its capital structure in 2010–2012. We assume the same for 2013. The projected amount of preferred stock at the end of 2013 is, therefore, zero.

**Common Stock and Additional Paid-In Capital** The assumptions for the cash account indicated that Great Deal would issue common equity if the amount of cash generated during the year was insufficient to meet the projected balance in the cash account of \$2,070 million. The amount of cash generated or consumed by Great Deal in 2013 is not yet known because we have not projected its statement of cash flows. For now, we will assume that Great Deal will not issue common equity during 2013. We will revisit this assumption if the statement of cash flows

<sup>11</sup>In more complex pro forma calculations, the projected amounts of current operating liabilities (unredeemed gift card liabilities and accrued compensation) might be tied to sales, because sales is an indicator of the level of operating activity. The projected amount of short-term debt would be linked to financing needs. In addition, the projected current portion of long-term debt is disclosed in the notes to the financial statements. This amount would typically be known from debt contracts that specify how much of the debt is due in the coming year.



indicates that cash is needed. The projected amounts for common stock and additional paid-in capital at the end of fiscal 2013 are, therefore, equal to their 2012 balances of \$42 million and \$441 million, respectively.

**Accumulated Other Comprehensive Income** We assume Accumulated Other Comprehensive Income grows in proportion to total assets. The projected amount in Accumulated Other Comprehensive Income at the end of 2013 is \$46 ( $= \$20,743 \times 0.22\%$ ) million.

**Noncontrolling Interests** We assume noncontrolling interests maintain at the same common-size percentage as in fiscal 2012. Projected noncontrolling interests for 2013 is \$730 ( $= \$20,743 \times 3.52\%$ ) million.

### STEP 5: PROJECT INTEREST EXPENSE, INCOME TAX EXPENSE, NET INCOME, DIVIDENDS, AND THE CHANGE IN RETAINED EARNINGS

**Interest Expense** Interest expense usually has a fairly stable relation to the level of borrowing. Our projection of non-operating liabilities assumed an interest rate of 6% on debt outstanding during 2013. The average projected amount of debt outstanding for 2013 equals \$1,922 [ $= 0.5 \times (\$663 + \$35 + \$1,104 + \$751 + \$39 + \$1,251)$ ] million. Projected interest expense is \$115 [ $= 0.06 \times \$1,922$ ] million.

**Income Tax Expense** Projections of sales, operating expenses, and interest expense yield income before income taxes of \$2,832 ( $= \$54,663 - \$41,107 - \$10,659 + \$50 - \$115$ ) million. We assume a 2013 income tax rate of 36%. Projected income tax expense is \$1,020 ( $= 0.36 \times \$2,832$ ) million.

**Retained Earnings** Retained earnings increase by the projected net income for 2013 and decrease by the amount of dividends declared. The amount of net income projected for 2013 is \$1,899 million, as indicated by the pro forma income statement shown in **Exhibit 7.13**. There are two approaches to calculating the amount of dividends declared. Under the first approach, we apply the balance sheet equation to determine the total amount of retained earnings projected for 2013, and then apply the retained earnings equation to infer the amount of dividends declared:

$$\begin{aligned} \text{Assets} &= \$20,743 \text{ million} \\ \text{Liabilities} &= \$5,980 + \$525 + \$616 + \$1,904 + \$359 + \$751 + \$39 + \$1,423 + \$1,251 \\ &= \$12,848 \text{ million} \\ \\ \text{Shareholders' Equity} &= \$42 + \$441 + \text{Retained Earnings} + \$46 + \$730 \\ &= \$1,259 + \text{Retained Earnings} \end{aligned}$$

Balance Sheet equation:

$$\begin{aligned} \text{Assets} &= \text{Liabilities} + \text{Shareholders' Equity} \\ \$20,743 &= \$12,848 + \$1,259 + \text{Retained Earnings} \end{aligned}$$

Solving for Retained Earnings yields:

$$\text{Retained Earnings, end of 2013} = \$6,636 \text{ million}$$

Next, we apply the retained earnings equation and solve for the amount of dividends:

$$\begin{aligned} \text{Retained Earnings, Ending} &= \text{Retained Earnings, Beginning} + \text{Net Income} - \text{Dividends} \\ \$6,636 &= \$5,797 + \$1,809 - \text{Dividends} \\ \text{Dividends} &= \$970 \text{ million} \end{aligned}$$

Under the second approach, we project Great Deal's statement of cash flows and determine the amount of excess cash (if any) that the firm generates in fiscal 2013. According to our cash assumptions, any cash in excess of \$2,070 million will be paid as dividends. We will revisit this second approach after we have calculated Great Deal's pro forma statement of cash flows for 2013.

The preparation of pro forma financial statements through the first five steps results in a projected income statement (**Exhibit 7.13**) and a projected balance sheet (**Exhibit 7.14**).

**EXHIBIT 7.13****Great Deal, Inc.  
Pro Forma Statement of Earnings  
(amounts in millions of US\$)**

	2013
Revenue . . . . .	\$54,663
Cost of Goods Sold . . . . .	<u>41,107</u>
Gross Profit . . . . .	\$13,557
Selling, General, and Administrative Expenses . . . . .	10,659
Restructuring Charges . . . . .	0
Goodwill and Trade Name Impairment . . . . .	<u>0</u>
Operating Income . . . . .	\$ 2,897
Other Income (Expense) . . . . .	
Investment Income and Other . . . . .	50
Investment Impairment . . . . .	0
Interest Expense . . . . .	<u>(115)</u>
Earnings Before Income Tax Expense and Equity in Income (Loss) of Affiliates . . . . .	\$ 2,832
Income Tax Expense . . . . .	1,020
Equity in Income (Loss) of Affiliates . . . . .	<u>(3)</u>
Net Earnings Including Noncontrolling Interests . . . . .	\$ 1,809
Net Earnings Attributable to Noncontrolling Interests . . . . .	<u>(100)</u>
Net Earnings Attributable to Great Deal . . . . .	<u>\$ 1,709</u>

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**STEP 6: PROJECT THE STATEMENT OF CASH FLOWS**

The analyst can prepare a pro forma statement of cash flows directly from the pro forma income statement and pro forma balance sheet. **Exhibit 7.15** presents the pro forma statement of cash flows for Great Deal for fiscal 2013.

Note the following about the projected statement of cash flows:

- We calculate the amount of property, plant, and equipment purchased (capital expenditures) during 2013 from the change in the ending balances in this account. That amount is \$994 (= \$8,447 – \$7,453) million. The amount of depreciation expense equals the change in the accumulated depreciation account. Depreciation expense for 2013 is \$450 (= \$3,833 – \$3,383) million. As described in **Chapter 10**, these calculations are more complex if there are disposals of fixed assets during the year.
- The increase in cash during 2013 of \$244 (= \$2,377 – \$1,494 – \$645 + 6) million on the statement of cash flows reconciles to the change in cash on the pro forma balance sheet.
- If we had not calculated dividends using the first approach described under step 5, we could calculate dividends from the statement of cash flows using the second approach described in step 5. The cash assumptions imply the cash balance at the end of 2013 is \$2,070 million. Given the non-dividend cash flows projected by the statement of cash flows, we can infer the dividends needed to reach this ending cash balance:

Cash flows from operations	\$2,377
– Cash flows used in investing	(\$1,494)
+ Cash flows from financing	<u>\$239 + \$86 + 6 – Dividends</u>
= Change in cash	\$244

We can solve for the amount of dividends as follows:

$$\begin{aligned} \$2,377 - \$1,494 + \$239 + 86 + 6 - \text{Dividends} &= \$244 \text{ million} \\ \text{Dividends} &= \$970 \text{ million} \end{aligned}$$

**EXHIBIT 7.14**
**Great Deal, Inc.**  
**Pro Forma Balance Sheet**  
**(amounts in millions of US\$)**

	2013
<b>Assets</b>	
Current Assets	
Cash and Cash Equivalents . . . . .	\$ 2,070
Short-Term Investments . . . . .	102
Receivables . . . . .	2,290
Merchandise Inventories . . . . .	6,216
Other Current Assets . . . . .	<u>1,297*</u>
Total Current Assets . . . . .	\$11,975
Property and Equipment	
Land and Buildings . . . . .	\$ 858
Leasehold Improvements . . . . .	2,441
Fixtures and Equipment . . . . .	5,040
Property Under Capital Lease . . . . .	<u>108</u>
	8,447
Less: Accumulated Depreciation . . . . .	<u>3,833</u>
Net Property and Equipment . . . . .	4,614
Goodwill . . . . .	2,780
Trade Names . . . . .	180
Customer Relationships . . . . .	315
Equity and Other Investments . . . . .	367
Other Assets . . . . .	<u>512</u>
Total Assets . . . . .	<u>\$20,743</u>
<b>Liabilities and Shareholders' Equity</b>	
Current Liabilities	
Accounts Payable . . . . .	\$ 5,980
Unredeemed Gift Card Liabilities . . . . .	525
Accrued Compensation and Related Expenses . . . . .	616
Accrued Liabilities . . . . .	1,904
Accrued Income Taxes . . . . .	359
Short-Term Debt . . . . .	751
Current Portion of Long-Term Debt . . . . .	<u>39</u>
Total Current Liabilities . . . . .	\$10,174
Long-Term Liabilities . . . . .	1,423
Long-Term Debt . . . . .	1,251
Commitments and Contingencies	
Shareholders' Equity	
Great Deal Shareholders' Equity	
Preferred Stock . . . . .	0
Common Stock . . . . .	42
Additional Paid-In Capital . . . . .	441
Retained Earnings . . . . .	6,636
Accumulated Other Comprehensive Income . . . . .	<u>46</u>
Total Great Deal Shareholders' Equity . . . . .	\$ 7,165
Noncontrolling Interests . . . . .	<u>730</u>
Total Shareholders' Equity . . . . .	<u>\$ 7,895</u>
Total Liabilities and Shareholders' Equity . . . . .	<u>\$20,743</u>

\*Rounded up to balance statement.

**EXHIBIT 7.15****Great Deal, Inc.  
Pro Forma Statement of Cash Flows  
(amounts in millions of US\$)**

	2013
<b>Operating Activities</b>	
Net Earnings Including Noncontrolling Interests . . . . .	\$ 1,809
Adjustments to Reconcile Net Earnings to Total Cash Provided by Operating Activities:	
Depreciation . . . . .	450
Changes in Operating Assets, Net of Acquired Assets and Liabilities:	
Receivables . . . . .	(270)
Merchandise Inventories . . . . .	(730)
Other Current Assets . . . . .	(153)
Accounts Payable . . . . .	704
Other Liabilities . . . . .	357
Accrued Income Taxes . . . . .	43
Long-Term Liabilities . . . . .	167
<i>Total Cash Provided By Operating Activities.</i> . . . .	<u>\$ 2,377</u>
<b>Investing Activities</b>	
Additions to PPE . . . . .	\$ (994)
Purchases of Intangible Assets . . . . .	(385)
Purchases of Short-Term Investments . . . . .	(12)
Purchases of Equity Investments . . . . .	(43)
Other Noncurrent Assets . . . . .	(60)
<i>Total Cash (Used in) Provided by Investing Activities</i> . . . . .	<u>\$(1,494)</u>
<b>Financing Activities</b>	
Issuance of Common Stock . . . . .	\$ 0
Dividends Paid . . . . .	(970)
Debt Issuances . . . . .	239
Increase in Noncontrolling Interests . . . . .	86
<i>Total Cash (Used in) Provided by Financing Activities.</i> . . . .	<u>\$ (645)</u>
Effect of Exchange Rate Changes in Cash . . . . .	6
<b>Increase (Decrease) in Cash and Cash Equivalents</b> . . . . .	244
<b>Cash and Cash Equivalents at Beginning of Year</b> . . . . .	1,826
<b>Cash and Cash Equivalents at End of Year.</b> . . . .	<u>\$ 2,070</u>

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**SOLUTIONS TO SELF-STUDY PROBLEMS****SUGGESTED SOLUTION TO PROBLEM 7.1 FOR SELF-STUDY**

(Markum Corporation; analyzing return on equity.)

$$\text{a. Return on equity} = \frac{\text{Net Income}}{\text{Average Shareholders' Equity}} = \frac{\$4,800}{\$51,600} = 9.3\%$$

$$\text{b. Return on assets, unadjusted for financing} = \frac{\text{Net Income}}{\text{Average Total Assets}} = \frac{\$4,800}{\$112,000} = 4.3\%$$

c. Markum's ROE exceeds its ROA because its financial leverage exceeds 1.0. As shown below, Markum's financial leverage is 2.2:

$$\frac{\text{Average Total Assets}}{\text{Average Shareholders' Equity}} = \frac{\$112,000}{\$51,600} = 2.2$$

**SUGGESTED SOLUTION TO PROBLEM 7.2 FOR SELF-STUDY**

(Markum Corporation; analyzing the return on assets.)

Return on Assets	$\frac{\text{Net Income}}{\text{Average Total Assets}}$	$= \frac{\$4,800}{\$112,000}$	$= 4.3\%$
Profit Margin	$\frac{\text{Net Income}}{\text{Sales}}$	$= \frac{\$4,800}{\$92,000}$	$= 5.2\%$
Cost of Sales Percentage	$\frac{\text{Cost of Goods Sold}}{\text{Sales}}$	$= \frac{\$67,000}{\$92,000}$	$= 72.8\%$
SG&A Percentage	$\frac{\text{SG\&A Expense}}{\text{Sales}}$	$= \frac{\$8,000}{\$92,000}$	$= 8.7\%$
R&D Percentage	$\frac{\text{R\&D Expense}}{\text{Sales}}$	$= \frac{\$7,000}{\$92,000}$	$= 7.6\%$
Asset Turnover Ratio	$\frac{\text{Sales}}{\text{Average Total Assets}}$	$= \frac{\$92,000}{\$112,000}$	$= 0.8$ time per year
Accounts Receivable Turnover	$\frac{\text{Sales}}{\text{Average Accounts Receivable}}$	$= \frac{\$92,000}{\$13,500}$	$= 6.8$ times per year
Inventory Turnover	$\frac{\text{Cost of Goods Sold}}{\text{Average Inventory}}$	$= \frac{\$67,000}{\$24,000}$	$= 2.8$ times per year
Fixed-Asset Turnover	$\frac{\text{Sales}}{\text{Average Fixed Assets}}$	$= \frac{\$92,000}{\$69,500}$	$= 1.3$ times per year

**SUGGESTED SOLUTION TO PROBLEM 7.3 FOR SELF-STUDY**

(Markum Corporation; analyzing short-term liquidity risk.)

a. Current Ratio	$\frac{\text{Current Assets}}{\text{Current Liabilities}}$	$= \frac{\$49,000}{\$50,000}$	$= 98.0\%$
Quick Ratio	$\frac{\text{Cash} + \text{Receivables}}{\text{Current Liabilities}}$	$= \frac{\$21,000}{\$50,000}$	$= 42.0\%$
b. Accounts Receivable Turnover	$\frac{\text{Sales}}{\text{Average Accounts Receivable}}$	$= \frac{\$92,000}{\$13,500}$	$= 6.8$ times per year
Inventory Turnover	$\frac{\text{Cost of Goods Sold}}{\text{Average Inventory}}$	$= \frac{\$67,000}{\$24,000}$	$= 2.8$ times per year
Accounts Payable Turnover	$\frac{\text{Purchases}}{\text{Average Accounts Payable}}$	$= \frac{\$75,000}{\$27,900}$	$= 2.7$ times per year
c. Days Accounts Receivable	$\frac{365}{\text{Accounts Receivable Turnover}}$	$= \frac{365}{6.8}$	$= 54$ days
Days Inventory	$\frac{365}{\text{Inventory Turnover}}$	$= \frac{365}{2.8}$	$= 130$ days
Days Payables	$\frac{365}{\text{Accounts Payable Turnover}}$	$= \frac{365}{2.7}$	$= 135$ days
Operating Cycle	$\text{Days A/R} + \text{Days Inventory} - \text{Days Payables}$		$= 49$ days

- d. Markum's short-term liquidity risk seems somewhat high at the end of 2013. Its current ratio of 98.0% is below 1.0. Markum's quick ratio (of 42.0%) is lower than the benchmark range of roughly half its current ratio. Its operating cycle is 49 days, indicating that Markum would require 49 days of financing to cover the net period when its cash outflows exceed its cash inflows.

**SUGGESTED SOLUTION TO PROBLEM 7.4 FOR SELF-STUDY**

(Markum Corporation; analyzing long-term liquidity risk.)

		2012		2013	
a.	Liabilities to Assets Ratio	$\frac{\text{Total Liabilities}}{\text{Total Assets}} =$	$\frac{\$52,800}{\$100,000} = 52.8\%$	$\frac{\$68,000}{\$124,000} =$	54.8%
	Long-Term Debt Ratio	$\frac{\text{Total Long-Term Debt}}{\text{Total Assets}} =$	$\frac{\$12,000}{\$100,000} = 12.0\%$	$\frac{\$18,000}{\$124,000} =$	14.5%
	Debt-Equity Ratio	$\frac{\text{Total Long-Term Debt}}{\text{Total Shareholders' Equity}} =$	$\frac{\$12,000}{\$47,200} = 25.4\%$	$\frac{\$18,000}{\$56,000} =$	32.1%
b.	Interest Coverage Ratio	$\frac{\text{Net Income} + \text{Income Tax Expense} + \text{Interest Expense}}{\text{Interest Expense}} =$	$\frac{\$4,800 + \$3,200 + \$2,000}{\$2,000} = 5.0$	$\frac{\$1,800 + \$1,200 + \$1,000}{\$1,000} =$	4.0

c. Markum's long-term liquidity risk increased between 2012 and 2013, as evidenced by increasing debt ratios and a declining interest coverage ratio. The interest coverage ratio remains acceptable (albeit somewhat low) at the end of 2013, and the debt ratios are also well within reason. Overall, Markum's long-term solvency position is strong at the end of fiscal 2013.

**SUGGESTED SOLUTION TO PROBLEM 7.5 FOR SELF-STUDY**

(Consumer Electronics Limited; computing profitability and risk ratios.)

a.	Return on Equity (ROE)	$= \frac{\$1,483}{0.5 \times (\$5,377 + \$6,763)} = 24.4\%$
b.	Return on Assets (ROA)	$= \frac{\$1,483}{0.5 \times (\$10,797 + \$12,143)} = 12.9\%$
c.	Financial Leverage Ratio	$= \frac{0.5 \times (\$10,797 + \$12,143)}{0.5 \times (\$5,377 + \$6,763)} = 1.9$
d.	Profit Margin Ratio	$= \frac{\$1,483}{\$25,675} = 5.8\%$
e.	Cost of Goods Sold Percentage	$= \frac{\$17,765}{\$25,675} = 69.2\%$
f.	SG&A Percentage	$= \frac{\$5,681}{\$25,675} = 22.1\%$
g.	Asset Turnover Ratio	$= \frac{\$25,675}{0.5 \times (\$10,797 + \$12,143)} = 2.2 \text{ times per year}$
h.	Accounts Receivable Turnover Ratio	$= \frac{\$25,675}{0.5 \times (\$1,417 + \$1,512)} = 17.5 \text{ times per year}$
i.	Inventory Turnover Ratio	$= \frac{\$17,765}{0.5 \times (\$3,984 + \$3,567)} = 4.7 \text{ times per year}$
j.	Fixed-Asset Turnover Ratio	$= \frac{\$25,675}{0.5 \times (\$4,224 + \$6,151)} = 4.9 \text{ times per year}$
k.	Current Ratio	$= \frac{\$5,992}{\$3,639} = 1.6$
l.	Quick Ratio	$= \frac{\$612 + \$1,512}{\$3,639} = 0.58$
m.	Accounts Payable Turnover Ratio	$= \frac{\$17,765 + \$3,567 - \$3,984}{0.5 \times (\$1,066 + \$1,040)} = 16.5 \text{ times per year}$

n. Operating Cycle	=	$(365/17.5) + (365/4.7) - (365/16.5)$	=	76 days
o. Liabilities to Assets Ratio	=	$\frac{\$3,639 + \$1,741}{\$12,143}$	=	44.3%
p. Long-Term Debt Ratio	=	$\frac{\$1,741}{\$12,143}$	=	14.3%
q. Debt-Equity Ratio	=	$\frac{\$1,741}{\$6,763}$	=	25.7%
r. Interest Coverage Ratio	=	$\frac{\$1,483 + \$635 + \$123}{\$123}$	=	18.2 times

## KEY TERMS AND CONCEPTS

Return and risk	Operating cycle, cash cycle, earnings cycle
Profitability	Accounts payable turnover ratio
Return on equity (ROE)	Long-term liquidity risk
Return on assets (ROA)	Liabilities to assets ratio
Financial leverage	Long-term debt ratio
DuPont Decomposition Analysis	Debt-equity ratio
Profit margin ratio	Cash flow from operations to total liabilities ratio
Asset turnover, asset turnover ratio	Interest coverage ratio
Accounts receivable turnover ratio	Common-size balance sheet
Inventory turnover ratio	Common-size income statement
Fixed-asset turnover ratio	Time-series analysis
Liquidity	Cross-section analysis
Short-term liquidity risk	Pro forma financial statements
Current ratio	
Quick ratio or acid test ratio	
Cash flow from operations to current liabilities ratio	

## QUESTIONS, EXERCISES, AND PROBLEMS

### QUESTIONS

1. Review the meaning of the terms and concepts listed in Key Terms and Concepts.
2. “Financial ratios are useful metrics for relating two items in the financial statements. Interpreting changes in a particular financial ratio is difficult, however, because the explanation might relate to changes in the numerator, the denominator, or both.” Explain this statement using a change in the cost of goods sold to sales percentage from 65% to 68%.
3. In calculating return on assets, the simple ROA formula does not adjust for interest expense. Explain why it is technically more correct to make an adjustment for interest expense in calculating this ratio, and explain the form of the adjustment.
4. A firm’s total assets turnover decreased, but its accounts receivable, inventory, and fixed-asset turnover increased. Suggest possible explanations.
5. Explain why the return on equity of a company that has no preferred stock will be smaller than the return on equity of an otherwise similar firm that has preferred stock.
6. One company president stated, “The operations of our company are such that we must turn our assets over once every four weeks.” A company president in another industry

stated, “The operations of our company are such that we can live comfortably with asset turnover of four times each year.” Explain what these two company presidents probably had in mind.

7. Some have argued that for any given firm at a particular time, there is an optimal inventory turnover ratio. Explain.
8. Under what circumstances will the rate of return on equity exceed the rate of return on assets? Under what circumstances will it be less?
9. An entrepreneur claimed that her new company had generated *both* superior profit margin performance and superior asset turnover performance. Explain whether such an outcome is likely to happen.
10. Given how financial leverage affects ROE, why does a firm not borrow as much as possible? That is, why doesn't a firm increase borrowing to as close to 100% of financing as it can?

### EXERCISES

11. **Calculating and disaggregating the rate of return on assets.** Recent annual reports of two restaurant chains (Calem Incorporated and Garter Company) reveal the following (amounts in millions of US\$):

	Calem	Garter
Revenues . . . . .	\$2,352	\$22,787
Net Income . . . . .	76	2,335
Average Total Assets . . . . .	1,473	29,183

Calem operates a chain of restaurants featuring value-priced meals and owns all of its restaurants. Garter also sells value-priced meals but operates through both company-owned and franchised restaurants. Garter owns the land and buildings of most of its franchised restaurants and leases the space to the franchisees.

- a. Calculate the rate of return on assets for each company.
  - b. Disaggregate the rate of return on assets in part **a** into profit margin and total assets turnover components.
  - c. Comment on the relative profitability of the two companies.
12. **Profitability analysis for two types of retailers.** Information taken from recent annual reports of two retailers appears as follows (amounts in millions of US\$). One of these companies is a discount store chain, and the other is a specialty retailer of apparel. Indicate which of these companies is the discount store chain and which is the specialty retailer. Explain your reasoning using appropriate financial ratios.

	Company A	Company B
Sales . . . . .	\$3,750	\$6,834
Net Income . . . . .	476	243
Average Total Assets . . . . .	2,458	2,574

13. **Calculating and disaggregating rate of return on shareholders' equity.** Information taken from the annual reports of Mobilex, a petroleum company, for three recent years appears below (amounts in millions of US\$):

	2013	2012	2011
Revenues . . . . .	\$404,552	\$377,635	\$370,680
Net Income . . . . .	40,610	39,500	36,130
Average Total Assets . . . . .	230,549	213,675	201,796
Average Shareholders' Equity . . . . .	117,803	112,515	106,471



- a. Compute the rate of return on equity for each year.
  - b. Disaggregate the rate of return on equity into profit margin, total assets turnover, and financial leverage ratio components.
  - c. How has the profitability of Mobilex changed over the three years?
- 14. Profitability analysis for two companies.** The following data show four items from the financial statements of two companies for a recent year (amounts in millions of US\$):

	Company A	Company B
<b>For Year</b>		
Revenues . . . . .	\$3,750	\$6,143
Net Income . . . . .	476	934
<b>Average During Year</b>		
Total Assets . . . . .	2,458	5,594
Shareholders' Equity . . . . .	2,256	2,566

- a. Compute the rate of return on assets for each company. Disaggregate the rate of return on assets into profit margin and total assets turnover components.
  - b. Compute the rate of return on equity for each company. Disaggregate the rate of return on equity into profit margin, total assets turnover, and financial leverage ratio components.
  - c. The two companies are a manufacturer of brand-name motorcycles and an operator of specialty retail coffee shops, primarily in rented facilities. Which of the companies corresponds to A and B? What clues did you use in reaching your conclusions?
- 15. Profitability analysis for two companies.** The following data show four items from the financial statements of two companies for a recent year (amounts in millions of US\$):

	Company A	Company B
<b>For Year</b>		
Revenues . . . . .	\$38,334	\$93,469
Net Income . . . . .	6,986	6,999
<b>Average During Year</b>		
Total Assets . . . . .	52,010	187,882
Common Shareholders' Equity . . . . .	39,757	49,558

- a. Compute the rate of return on assets for each company and disaggregate ROA into profit margin and total assets turnover components.
  - b. Compute the rate of return on equity for each company and disaggregate ROE into profit margin, total assets turnover, and capital structure leverage components.
  - c. The two companies are a developer and manufacturer of semiconductors and a telecommunication service company. Which of the companies corresponds to A and B? What clues did you use in reaching your conclusions?
- 16. Analyzing accounts receivable for two companies.** The annual reports of Delta, Inc. and SunnyDay Company, two manufacturers of computers, reveal the information below for the current year (amounts in millions). Delta sells custom-order personal computers, primarily to individuals. SunnyDay sells higher-end computers and Internet software, primarily to businesses.

	Delta	SunnyDay
Sales . . . . .	\$61,133	\$13,873
Accounts Receivable, January 1 . . . . .	6,152	2,702
Accounts Receivable, December 31 . . . . .	7,693	2,964

- a. Compute the accounts receivable turnover for each company.

- b. Compute the average number of days that accounts receivable are outstanding for each company.
- c. Why do the accounts receivable turnovers of these two companies differ?
17. **Analyzing inventories over three years.** The following information relates to the activities of Funtime, Inc., a manufacturer of toys (amounts in millions of euros):

	2013	2012	2011
Sales . . . . .	€5,970	€5,650	€5,179
Cost of Goods Sold . . . . .	3,193	3,038	2,806
Average Inventory . . . . .	406	380	415

- a. Compute the inventory turnover for each year.
- b. Compute the average number of days that inventories are held each year.
- c. Compute the cost of goods sold to sales percentage for each year.
- d. How well has Funtime managed its inventories over the three years?
18. **Analyzing fixed-asset turnover over three years.** The following information relates to Mickey Group, an entertainment company (amounts in millions of pounds sterling):

	2013	2012	2011
Sales . . . . .	£35,510	£33,747	£31,374
Average Fixed Assets . . . . .	16,270	16,174	15,362
Expenditures on Fixed Assets . . . . .	1,566	1,299	1,823
Depreciation Expense . . . . .	1,491	1,436	1,339

- a. Compute the fixed-asset turnover for each year.
- b. How well has Mickey Group managed its investment in fixed assets over the three years?
19. **Calculating and interpreting short-term liquidity ratios.** Data taken from the financial statements of FleetSneak, a designer and manufacturer of athletic footwear and apparel, appear as follows (amounts in millions of US\$):

For the Year	2013	2012	2011	
Revenues . . . . .	\$16,326	\$14,955	\$13,740	
Cost of Goods Sold . . . . .	9,165	8,368	7,624	
Net Income . . . . .	1,492	1,392	1,212	
Cash Flow from Operations . . . . .	1,879	1,668	1,571	
On May 31	2013	2012	2011	2010
Cash and Marketable Securities . . . . .	\$ 2,847	\$ 2,303	\$ 1,825	\$ 1,229
Accounts Receivable . . . . .	2,495	2,383	2,262	2,120
Inventories . . . . .	2,122	2,077	1,811	1,650
Prepayments . . . . .	613	583	453	529
Total Current Assets . . . . .	<u>\$ 8,077</u>	<u>\$ 7,346</u>	<u>\$ 6,351</u>	<u>\$ 5,528</u>
Accounts Payable . . . . .	\$ 1,040	\$ 952	\$ 775	\$ 780
Bank Loans . . . . .	131	299	76	153
Other Current Liabilities . . . . .	1,413	1,362	1,148	1,098
Total Current Liabilities . . . . .	<u>\$ 2,584</u>	<u>\$ 2,613</u>	<u>\$ 1,999</u>	<u>\$ 2,031</u>

- a. Compute the current and quick ratios on May 31 of each year.
- b. Compute the cash flow from operations to current liabilities ratio and the accounts receivable, inventory, and accounts payable turnover ratios for 2011, 2012, and 2013.
- c. How has the short-term liquidity risk of FleetSneak changed during the three-year period?
20. **Calculating and interpreting short-term liquidity ratios.** Data taken from the financial statements of Geneva S.A., a consumer foods company headquartered in Switzerland, appear as follows (amounts in millions of euros):

For the Year	2013	2012	2011	
Revenues . . . . .	€89,625	€78,533	€73,135	
Cost of Goods Sold . . . . .	37,530	32,474	30,435	
Net Income . . . . .	8,874	7,277	6,498	
Cash Flow from Operations . . . . .	11,030	9,197	8,461	
On December 31	2013	2012	2011	2010
Cash and Marketable Securities . . . . .	€ 5,737	€ 7,129	€11,188	€ 9,887
Accounts Receivable . . . . .	9,316	9,056	9,193	7,640
Inventories . . . . .	5,602	4,988	5,250	4,545
Prepayments . . . . .	955	760	1,234	756
Total Current Assets . . . . .	<u>€21,610</u>	<u>€21,933</u>	<u>€26,865</u>	<u>€22,828</u>
Accounts Payable . . . . .	€ 8,566	€ 7,810	€ 7,151	€ 5,871
Bank Loans . . . . .	14,826	9,626	12,120	9,525
Other Current Liabilities . . . . .	2,783	2,742	3,792	3,415
Total Current Liabilities . . . . .	<u>€26,175</u>	<u>€20,178</u>	<u>€23,063</u>	<u>€18,811</u>

- a. Compute the current and quick ratios on December 31 of each year.
  - b. Compute the cash flow from operations to current liabilities ratio and the accounts receivable, inventory, and accounts payable turnover ratios for 2011, 2012, and 2013.
  - c. How has the short-term liquidity risk of Geneva changed during the three-year period?
21. **Calculating and interpreting long-term liquidity ratios.** Data taken from the financial statements of Kyoto Electric, a Japanese generator and provider of electric services, appear below (amounts in billions of Japanese yen).

For the Year	2013	2012	2011	
Net Income Before Interest and Income Taxes . . . . .	¥ 651	¥ 635	¥ 538	
Cash Flow from Operations . . . . .	1,074	936	1,411	
Interest Expense . . . . .	155	161	165	
On December 31	2013	2012	2011	2010
Long-Term Debt . . . . .	¥ 5,871	¥ 6,278	¥ 7,150	¥ 7,391
Total Liabilities . . . . .	10,488	10,814	11,247	11,540
Total Shareholders' Equity . . . . .	3,034	2,780	2,502	2,360

- a. Compute the long-term debt ratio and the debt-equity ratio at the end of 2010, 2011, 2012, and 2013.
  - b. Compute the cash flow from operations to total liabilities ratio and the interest coverage ratio for 2011 through 2013.
  - c. How has the long-term liquidity risk of Kyoto Electric changed over this three-year period?
22. **Calculating and interpreting long-term liquidity ratios.** Data taken from the financial statements of Arctagon, a steel manufacturer headquartered in the Netherlands, appear below (amounts in millions of euros). Arctagon acquired other steel companies during the three-year period.

For the Year	2013	2012	2011	
Net Income Before Interest Expense and Income Taxes . . . . .	€11,538	€ 6,624	€ 4,160	
Cash Flow from Operations . . . . .	8,539	6,828	6,034	
Interest Expense . . . . .	676	895	404	
On December 31	2013	2012	2011	2010
Long-Term Debt . . . . .	€15,106	€16,416	€ 6,760	€1,206
Total Liabilities . . . . .	52,749	53,114	17,448	7,760
Total Shareholders' Equity . . . . .	38,662	31,947	11,264	4,301

- a. Compute the long-term debt ratio and the debt–equity ratio at the end of each year.
  - b. Compute the cash flow from operations to total liabilities ratio and the interest coverage ratio for 2011 through 2013.
  - c. How has the long-term liquidity risk of Arctagon changed over this three-year period?
- 23. Effect of various transactions on financial statement ratios.** Indicate the immediate effects (increase, decrease, no effect) of each of the following independent transactions on (1) the rate of return on shareholders' equity, (2) the current ratio, and (3) the liabilities to assets ratio. State any necessary assumptions.
- a. A firm purchases, on account, merchandise inventory costing \$205,000.
  - b. A firm sells for \$150,000, on account, merchandise inventory costing \$120,000.
  - c. A firm collects \$100,000 from customers on accounts receivable.
  - d. A firm pays \$160,000 to suppliers on accounts payable.
  - e. A firm sells for \$10,000 a machine costing \$40,000 and with accumulated depreciation of \$30,000.
  - f. A firm declares dividends of \$80,000. It will pay the dividends during the next accounting period.
  - g. A firm issues common stock for \$75,000.
  - h. A firm acquires a machine costing \$60,000. It gives \$10,000 cash and signs a note for \$50,000 payable five years from now for the balance of the purchase price.
- 24. Effect of various transactions on financial statement ratios.** Indicate the effects (increase, decrease, no effect) of the following independent transactions on (1) working capital (= current assets – current liabilities) and (2) the quick ratio, where accounts receivable are included but merchandise inventory is excluded from quick assets. State any necessary assumptions.
- a. A firm sells for €300,000, on account, merchandise inventory costing €240,000.
  - b. A firm declares dividends of €160,000. It will pay the dividends during the next accounting period.
  - c. A firm purchases, on account, merchandise inventory costing €410,000.
  - d. A firm sells for €20,000 a machine costing €80,000 and with accumulated depreciation of €60,000.
  - e. Because of defects, a firm returns to the supplier merchandise inventory purchased for €7,000 cash. The firm receives a cash reimbursement.
  - f. A firm issues 10,000 shares of €10 par value common stock on the last day of the accounting period for €15 per share. It uses the proceeds to acquire the assets of another firm composed of the following: accounts receivable, €30,000; merchandise inventory, €60,000; plant and equipment, €100,000. The acquiring firm also agrees to pay current liabilities of €40,000 of the acquired company. The quick ratio of the acquired company is at least 0.75.

### PROBLEMS

- 25. Calculating and interpreting profitability and risk ratios in a time-series setting.** Bullseye Corporation, headquartered in the United States, operates retail stores that offer clothing, household products, electronic products, sports products, toys, and entertainment products at discount prices. Bullseye differentiates itself from competitors by pushing trend merchandising with more brand name products, by emphasizing customer service, and by providing a comfortable and attractive shopping experience. Bullseye also offers its own credit card to customers. Bullseye increased its number of stores from 1,397 on December 31, 2010, to 1,591 on December 31, 2013. The growth rate in sales of stores open at least two full years was 5.6% for the fiscal year ended December 31, 2011, 4.8% for the fiscal year ended December 31, 2012, and 3.0% for the fiscal year ended December 31, 2013. The financial statements for Bullseye for the fiscal years ended December 31, 2011, 2012, and 2013 appear in **Exhibit 7.16** (income statement), **Exhibit 7.17** (balance sheet), and **Exhibit 7.18** (statement of cash flows). **Exhibit 7.19** presents financial statement ratios for Bullseye for its fiscal years ended December 31, 2011 and 2012.

**EXHIBIT 7.16**

**Bullseye Corporation  
Comparative Income Statement  
(amounts in millions of US\$)  
(Problem 25)**

	For the Year Ended December 31		
	2013	2012	2011
Sales Revenue . . . . .	\$61,471	\$57,878	\$51,271
Other Revenues . . . . .	1,918	1,637	1,376
Total Revenues . . . . .	<u>63,389</u>	<u>59,515</u>	<u>52,647</u>
<b>Less Expenses:</b>			
Cost of Goods Sold . . . . .	41,895	39,399	34,927
Selling and Administrative . . . . .	16,200	15,022	13,370
Interest . . . . .	669	597	490
Total . . . . .	<u>58,764</u>	<u>55,018</u>	<u>48,787</u>
Income Before Income Taxes . . . . .	4,625	4,497	3,860
Income Tax Expense . . . . .	1,776	1,710	1,452
Net Income . . . . .	<u>\$ 2,849</u>	<u>\$ 2,787</u>	<u>\$ 2,408</u>

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**EXHIBIT 7.17**

**Bullseye Corporation  
Comparative Balance Sheet  
(amounts in millions of US\$)  
(Problem 25)**

	December 31			
	2013	2012	2011	2010
<b>ASSETS</b>				
Cash . . . . .	\$ 2,450	\$ 813	\$ 1,648	\$ 2,245
Accounts Receivable (net) . . . . .	8,054	6,194	5,666	5,069
Inventories . . . . .	6,780	6,254	5,838	5,384
Prepayments . . . . .	1,622	1,445	1,253	1,224
Total Current Assets . . . . .	<u>\$18,906</u>	<u>\$14,706</u>	<u>\$14,405</u>	<u>\$13,922</u>
Property, Plant, and Equipment (net) . . . . .	25,908	22,681	20,501	18,042
Other Noncurrent Assets . . . . .	1,559	1,212	1,552	1,511
Total Assets . . . . .	<u>\$46,373</u>	<u>\$38,599</u>	<u>\$36,458</u>	<u>\$33,475</u>
<b>LIABILITIES AND SHAREHOLDERS' EQUITY</b>				
Accounts Payable . . . . .	\$ 6,721	\$ 6,575	\$ 6,268	\$ 5,779
Current Portion of Long-Term Debt . . . . .	1,964	1,362	753	504
Other Current Liabilities . . . . .	3,097	3,180	2,567	1,937
Total Current Liabilities . . . . .	<u>\$11,782</u>	<u>\$11,117</u>	<u>\$ 9,588</u>	<u>\$ 8,220</u>
Long-Term Debt . . . . .	16,939	9,925	10,582	10,216
Other Noncurrent Liabilities . . . . .	2,345	1,924	2,083	2,010
Total Liabilities . . . . .	<u>\$31,066</u>	<u>\$22,966</u>	<u>\$22,253</u>	<u>\$20,446</u>
Common Stock (\$0.10 par value) . . . . .	\$ 68	\$ 72	\$ 73	\$ 74
Additional Paid-In Capital . . . . .	2,656	2,387	2,121	1,810
Retained Earnings . . . . .	12,761	13,417	12,013	11,148
Accumulated Other Comprehensive Income . . . . .	(178)	(243)	(2)	(3)
Total Shareholders' Equity . . . . .	<u>\$15,307</u>	<u>\$15,633</u>	<u>\$14,205</u>	<u>\$13,029</u>
Total Liabilities and Shareholders' Equity . . . . .	<u>\$46,373</u>	<u>\$38,599</u>	<u>\$36,458</u>	<u>\$33,475</u>

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**EXHIBIT 7.18**

**Bullseye Corporation**  
**Comparative Statement of Cash Flows**  
**(amounts in millions of US\$)**  
**(Problem 25)**

	For the Year Ended December 31		
	2013	2012	2011
<b>OPERATIONS</b>			
Net Income . . . . .	\$ 2,849	\$ 2,787	\$ 2,408
Additions and Subtractions:			
Depreciation Expense . . . . .	1,659	1,496	1,409
Other Addbacks and Subtractions . . . . .	485	296	474
(Increase) Decrease in Accounts Receivable . . . . .	(602)	(226)	(244)
(Increase) Decrease in Inventories . . . . .	(525)	(431)	(454)
(Increase) Decrease in Prepayments . . . . .	(38)	(25)	(52)
Increase (Decrease) in Accounts Payable . . . . .	111	435	489
Increase (Decrease) in Other Current Liabilities . . . . .	186	530	421
Cash Flow from Operations . . . . .	<u>\$ 4,125</u>	<u>\$ 4,862</u>	<u>\$ 4,451</u>
<b>INVESTING</b>			
Acquisitions of Property, Plant, and Equipment . . . . .	\$ (4,369)	\$ (3,928)	\$ (3,388)
Other Investing Transactions . . . . .	<u>(1,826)</u>	<u>(765)</u>	<u>(761)</u>
Cash Flow from Investing . . . . .	<u>\$ (6,195)</u>	<u>\$ (4,693)</u>	<u>\$ (4,149)</u>
<b>FINANCING</b>			
Increase (Decrease) in Short-Term Borrowing . . . . .	\$ 500	\$ —	\$ —
Increase in Long-Term Borrowing . . . . .	7,617	1,256	913
Issue of Common Stock . . . . .	210	181	231
Decrease in Long-Term Borrowing . . . . .	(1,326)	(1,155)	(527)
Acquisition of Common Stock . . . . .	(2,808)	(901)	(1,197)
Dividends . . . . .	(442)	(380)	(318)
Other Financing Transactions . . . . .	<u>(44)</u>	<u>(5)</u>	<u>(1)</u>
Cash Flow from Financing . . . . .	<u>\$ 3,707</u>	<u>\$ (1,004)</u>	<u>\$ (899)</u>
Net Change in Cash . . . . .	\$ 1,637	\$ (835)	\$ (597)
Cash, Beginning of Year . . . . .	813	1,648	2,245
Cash, End of Year . . . . .	<u>\$ 2,450</u>	<u>\$ 813</u>	<u>\$ 1,648</u>

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- a. Compute the amounts of the ratios listed in **Exhibit 7.19** for the fiscal year ended December 31, 2013.
  - b. What are the likely reasons for the changes in Bullseye's rate of return on assets during the three-year period? Analyze the financial ratios to the maximum depth possible.
  - c. What are the likely reasons for the changes in Bullseye's rate of return on equity during the three-year period?
  - d. How has the short-term liquidity risk of Bullseye changed during the three-year period?
  - e. How has the long-term liquidity risk of Bullseye changed during the three-year period?
- 26. Profitability and risk analysis in a cross-section setting.** This problem compares the profitability and risk ratios of three leading discount chains: Cartoo, Taggle, and Wilmet. Cartoo is headquartered in Spain, and Taggle and Wilmet are headquartered in the United States. **Exhibits 7.20** and **7.21** present profitability ratios for Cartoo, Taggle, and Wilmet for fiscal years 2011, 2012, and 2013. **Exhibit 7.22** presents risk ratios for the three firms. **Exhibit 7.23** presents selected other data for these firms. All amounts are expressed in U.S. dollars to permit comparability across the firms. The first item in **Exhibit 7.23** shows both the increase in total sales and, in brackets, the increase in sales of stores that have been open for at least two full years (same store sales). The increase in total sales equals the sum of increases in same store sales and increases in sales due to opening new stores and acquiring new stores through corporate acquisitions. Study these financial ratios and respond to the following questions:

**EXHIBIT 7.19**

**Bullseye Corporation  
Financial Ratio Analysis  
(Problem 25)**

For Fiscal Year:	2012	2011
Return on Assets . . . . .	7.4%	6.9%
Profit Margin . . . . .	4.8%	4.7%
Total Assets Turnover . . . . .	1.5	1.5
Other Revenues/Sales . . . . .	2.8%	2.7%
Cost of Goods Sold/Sales . . . . .	68.1%	68.1%
Selling and Administrative Expenses/Sales . . . . .	26.0%	26.1%
Interest Expense/Sales . . . . .	1.0%	1.0%
Income Tax Expense/Sales . . . . .	3.0%	2.8%
Accounts Receivable Turnover Ratio . . . . .	9.8	9.6
Inventory Turnover Ratio . . . . .	6.5	6.2
Fixed-Assets Turnover Ratio . . . . .	2.7	2.7
Return on Equity . . . . .	18.7%	17.7%
Financial Leverage Ratio . . . . .	2.5	2.6
Current Ratio . . . . .	1.3	1.5
Quick Ratio . . . . .	0.6	0.8
Accounts Payable Turnover Ratio . . . . .	6.2	5.9
Cash Flow from Operations to Current Liabilities Ratio . . . . .	47.0%	50.0%
Liabilities to Assets Ratio . . . . .	59.5%	61.0%
Long-Term Debt Ratio . . . . .	25.7%	29.0%
Debt-Equity Ratio . . . . .	63.5%	74.5%
Cash Flow from Operations to Total Liabilities Ratio . . . . .	21.5%	20.8%
Interest Coverage Ratio . . . . .	8.5	8.9

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- a. Wilmet and Taggle follow different strategies. Wilmet consistently has a higher rate of return on assets (ROA) than Taggle. Using information in the exhibits, suggest reasons for these differences in operating profitability.
  - b. Wilmet and Cartoo follow similar strategies. Wilmet consistently outperforms Cartoo on ROA. Using information in the exhibits, suggest reasons for these differences in operating profitability.
  - c. Do any of these firms appear unduly risky as of the end of 2013?
- 27. Calculating and interpreting profitability and risk ratios.** Gappo Group and Limito Brands maintain leading market positions in the specialty apparel retailing market. The products of Gappo (jeans, blouses, shirts) are more standardized than those of Limito. The products of Limito are more fashion-oriented and glitzy. **Exhibit 7.24** presents comparative income statements for fiscal year 2013, and **Exhibit 7.25** presents comparative balance sheets for Gappo and Limito at the ends of their 2012 and 2013 fiscal years. Cash flows from operations for fiscal year 2013 were \$2,081 million for Gappo and \$765 million for Limito. The income tax rate is 35%. On the basis of this information and appropriate financial statement ratios, which company is
- a. More profitable in fiscal year 2013?
  - b. Less risky in terms of short-term liquidity in fiscal year 2013?
  - c. Less risky in terms of long-term liquidity in fiscal year 2013?
- 28. Interpreting profitability and risk ratios.** Depkline plc is a pharmaceutical company headquartered in the United Kingdom. **Exhibit 7.26** presents financial statement ratios for Depkline for 2011, 2012, and 2013. Respond to each of the following questions.
- a. What are the likely reasons for the increase in the profit margin during the three-year period from 2011 to 2013?
  - b. What are the likely reasons for the decrease in the total asset turnover from 0.88 in 2012 to 0.81 in 2013?

**EXHIBIT 7.20****Cartoo, Taggle, and Wilmet  
Cross-Section ROA Profitability Analysis  
(Problem 26)**

	ROA		
	2011	2012	2013
Cartoo . . . . .	3.8%	3.4%	3.5%
Taggle . . . . .	7.0%	7.2%	6.4%
Wilmet . . . . .	8.5%	8.0%	7.8%

	Profit Margin			Total Assets Turnover		
	2011	2012	2013	2011	2012	2013
Cartoo . . . . .	2.5%	2.4%	2.3%	1.5	1.4	1.5
Taggle . . . . .	4.7%	4.8%	4.6%	1.5	1.5	1.4
Wilmet . . . . .	3.7%	3.5%	3.4%	2.3	2.3	2.3

	Cartoo			Taggle			Wilmet		
	2011	2012	2013	2011	2012	2013	2011	2012	2013
Sales . . . . .	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Other Revenues . . . . .	1.5	1.4	1.5	2.7	2.8	3.1	1.1	1.2	1.2
Cost of Goods Sold . . . . .	(80.4)	(80.6)	(80.7)	(68.1)	(68.1)	(68.2)	(76.9)	(76.6)	(76.5)
Advertising . . . . .	(1.5)	(1.4)	(1.5)	(2.0)	(2.0)	(1.9)	(0.5)	(0.6)	(0.5)
Selling and Administrative . . . . .	(15.2)	(15.1)	(15.1)	(24.1)	(23.9)	(24.4)	(17.7)	(18.1)	(18.4)
Income Taxes . . . . .	(1.3)	(1.3)	(1.2)	(3.2)	(3.3)	(3.3)	(2.0)	(2.0)	(2.0)
Profit Margin . . . . .	2.5%	2.4%	2.3%	4.7%	4.8%	4.6%	3.7%	3.5%	3.4%
Receivable Turnover . . . . .	13.8	12.8	13.3	9.6	9.8	8.6	141.2	125.4	115.3
Inventory Turnover . . . . .	10.0	10.2	10.3	6.2	6.5	6.4	7.7	8.0	8.3
Fixed-Asset Turnover . . . . .	3.8	3.9	3.9	2.7	2.7	2.5	3.9	3.8	3.7
<b>Percentage of Total Assets:</b>									
Receivables . . . . .	11%	12%	10%	16%	16%	17%	2%	2%	2%
Inventory . . . . .	12	11	12	16	16	15	22	22	20
Fixed Assets . . . . .	37	37	37	56	59	56	59	60	61
Other . . . . .	40	40	41	12	9	12	17	16	17
Total . . . . .	<u>100%</u>	<u>100%</u>	<u>100%</u>	<u>100%</u>	<u>100%</u>	<u>100%</u>	<u>100%</u>	<u>100%</u>	<u>100%</u>



**EXHIBIT 7.21**

**Cartoo, Taggle, and Wilmet  
Cross-Section ROE Profitability Analysis  
(Problem 26)**

	ROE								
	2011	2012	2013						
Cartoo . . . . .	23.6%	20.8%	18.6%						
Taggle . . . . .	17.7%	18.7%	18.4%						
Wilmet . . . . .	22.2%	21.2%	20.4%						

	Profit Margin			Total Assets Turnover			Financial Leverage		
	2011	2012	2013	2011	2012	2013	2011	2012	2013
Cartoo . . . . .	2.5%	2.4%	2.3%	1.5	1.4	1.5	6.5	6.0	5.6
Taggle . . . . .	4.7%	4.8%	4.6%	1.5	1.5	1.4	2.6	2.5	2.7
Wilmet . . . . .	3.7%	3.5%	3.4%	2.3	2.3	2.3	2.6	2.6	2.6

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**EXHIBIT 7.22**

**Cartoo, Taggle, and Wilmet  
Cross-Section Risk Analysis  
(Problem 26)**

	Cartoo			Taggle			Wilmet		
	2011	2012	2013	2011	2012	2013	2011	2012	2013
<b>Short-Term Liquidity</b>									
Current Ratio . . . . .	0.65	0.66	0.67	1.50	1.32	1.60	0.90	0.90	0.81
Quick Ratio . . . . .	0.36	0.37	0.36	0.76	0.63	0.89	0.19	0.20	0.16
Cash Flow from Operations to Current Liabilities Ratio . . . .	19.4%	16.4%	19.4%	50.0%	47.0%	36.0%	38.3%	40.1%	36.9%
Days Receivable . . . . .	26	29	27	38	37	42	3	3	3
Days Inventory . . . . .	36	36	36	59	56	57	48	46	44
Days Payable . . . . .	95	96	91	62	59	57	36	37	37
<b>Long-Term Liquidity</b>									
Liabilities to Assets Ratio . . . .	82.1%	80.6%	80.0%	61.0%	59.5%	67.0%	63.2%	60.8%	62.5%
Long-Term Debt Ratio . . . . .	26.3%	25.9%	25.7%	29.0%	25.7%	36.5%	25.3%	23.4%	24.5%
Debt-Equity Ratio . . . . .	146.8%	133.4%	128.6%	74.5%	63.5%	110.7%	68.7%	59.8%	65.5%
Cash Flow from Operations to Total Liabilities Ratio . . . . .	11.2%	10.1%	11.8%	20.8%	21.5%	15.3%	21.0%	21.6%	20.0%
Interest Coverage Ratio . . . . .	6.6	6.5	6.0	8.9	8.5	7.9	13.1	11.3	10.4

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**EXHIBIT 7.23****Cartoo, Taggle, and Wilmet  
Selected Other Financial Data  
(Problem 26)**

	2011	2012	2013
<b>Growth Rate in Sales [same store]</b>			
Cartoo . . . . .	1.0% [0.9%]	5.2% [1.2%]	6.8% [1.8%]
Taggle . . . . .	12.2% [5.6%]	12.9% [4.8%]	6.3% [3.0%]
Wilmet . . . . .	9.8% [3.4%]	11.7% [2.0%]	8.6% [1.6%]
<b>Number of Stores</b>			
Cartoo . . . . .	7,003	7,358	7,906
Taggle . . . . .	1,397	1,488	1,591
Wilmet . . . . .	6,141	6,779	7,262
<b>Square Footage (000s)</b>			
Cartoo . . . . .	156,216	164,354	181,899
Taggle . . . . .	178,260	192,064	207,945
Wilmet . . . . .	741,897	806,988	869,341
<b>Sales per Square Foot</b>			
Cartoo . . . . .	\$582	\$587	\$618
Taggle . . . . .	\$288	\$301	\$296
Wilmet . . . . .	\$416	\$428	\$431
<b>Sales per Store</b>			
Cartoo . . . . .	\$12,988,587	\$13,103,550	\$14,224,804
Taggle . . . . .	\$36,700,787	\$38,896,505	\$38,636,706
Wilmet . . . . .	\$50,308,582	\$50,891,282	\$51,573,396
<b>Square Feet per Store</b>			
Cartoo . . . . .	22,307	22,337	23,008
Taggle . . . . .	127,602	129,075	130,701
Wilmet . . . . .	120,810	119,042	119,711
<b>Inventory per Square Foot</b>			
Cartoo . . . . .	\$49	\$46	\$52
Taggle . . . . .	\$33	\$33	\$33
Wilmet . . . . .	\$43	\$42	\$40
<b>Fixed Assets per Square Foot</b>			
Cartoo . . . . .	\$156	\$154	\$163
Taggle . . . . .	\$115	\$118	\$125
Wilmet . . . . .	\$115	\$117	\$122
<b>Sales per Employee</b>			
Cartoo . . . . .	\$242,942	\$248,590	\$269,992
Taggle . . . . .	\$178,458	\$193,443	\$197,592
Wilmet . . . . .	\$201,925	\$213,617	\$209,818

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- c. What are the likely reasons for the decrease in the current ratio from 1.5 in 2012 to 1.3 in 2013?
- d. What are the likely reasons for the pattern of changes in the two cash flow ratios during the three-year period from 2012 to 2013?
29. **Interpreting profitability and risk ratios.** Scantania is a Swedish company that manufactures trucks and other heavy vehicles and provides financing for its customers' purchases. **Exhibit 7.27** presents financial statement ratios for Scantania for 2011, 2012, and 2013. The amount on the common-size income statement for Net Financing Income is the difference between interest earned on receivables from customers and interest expense on amounts borrowed to finance those receivables.

**EXHIBIT 7.24**

**Gappo Group and Limito Brands  
Comparative Income Statements  
(amounts in millions of US\$)  
(Problem 27)**

<b>For the Year Ended August 31, 2013:</b>	<b>Gappo Group</b>	<b>Limito Brands</b>
Sales . . . . .	\$15,763	\$10,134
Interest Revenue . . . . .	117	146
Net Gains from Divestments of Retail Stores . . . . .	—	230
<b>Total Revenues . . . . .</b>	<b>\$15,880</b>	<b>\$10,510</b>
<b>Expenses:</b>		
Cost of Goods Sold . . . . .	\$10,071	\$ 6,592
Selling and Administrative . . . . .	4,377	2,640
Interest . . . . .	26	149
Income Taxes . . . . .	539	411
<b>Total Expenses . . . . .</b>	<b>\$15,013</b>	<b>\$ 9,792</b>
<b>Net Income . . . . .</b>	<b>\$ 867</b>	<b>\$ 718</b>

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**EXHIBIT 7.25**

**Gappo Group and Limito Brands  
Comparative Balance Sheets  
(amounts in millions of US\$)  
(Problem 27)**

<b>For the Year Ended August 31:</b>	<b>Gappo Group</b>		<b>Limito Brands</b>	
	<b>2013</b>	<b>2012</b>	<b>2013</b>	<b>2012</b>
<b>ASSETS</b>				
Cash and Marketable Securities . . . . .	\$1,939	\$2,644	\$1,018	\$ 500
Accounts Receivable . . . . .	—	—	355	176
Inventories . . . . .	1,575	1,796	1,251	1,770
Prepayments . . . . .	572	589	295	325
<b>Total Current Assets . . . . .</b>	<b>\$4,086</b>	<b>\$5,029</b>	<b>\$2,919</b>	<b>\$2,771</b>
Property, Plant, and Equipment (net) . . . . .	3,267	3,197	1,862	1,862
Other Noncurrent Assets . . . . .	485	318	2,656	2,460
<b>Total Assets . . . . .</b>	<b>\$7,838</b>	<b>\$8,544</b>	<b>\$7,437</b>	<b>\$7,093</b>
<b>LIABILITIES AND SHAREHOLDERS' EQUITY</b>				
Accounts Payable . . . . .	\$1,006	\$ 772	\$ 517	\$ 593
Current Portion of Long-Term Debt . . . . .	138	325	7	8
Other Current Liabilities . . . . .	1,289	1,175	850	1,108
<b>Total Current Liabilities . . . . .</b>	<b>\$2,433</b>	<b>\$2,272</b>	<b>\$1,374</b>	<b>\$1,709</b>
Long-Term Debt . . . . .	50	188	2,905	1,665
Other Noncurrent Liabilities . . . . .	1,081	910	939	764
<b>Total Liabilities . . . . .</b>	<b>\$3,564</b>	<b>\$3,370</b>	<b>\$5,218</b>	<b>\$4,138</b>
Common Stock . . . . .	\$ 55	\$ 55	\$ 262	\$ 262
Additional Paid-In Capital . . . . .	2,783	2,631	1,550	1,565
Retained Earnings . . . . .	9,223	8,646	4,758	4,277
Accumulated Other Comprehensive Income . . . . .	125	77	31	(17)
Treasury Stock . . . . .	(7,912)	(6,235)	(4,382)	(3,132)
<b>Total Shareholders' Equity . . . . .</b>	<b>\$4,274</b>	<b>\$5,174</b>	<b>\$2,219</b>	<b>\$2,955</b>
<b>Total Liabilities and Shareholders' Equity . . . . .</b>	<b>\$7,838</b>	<b>\$8,544</b>	<b>\$7,437</b>	<b>\$7,093</b>

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**EXHIBIT 7.26****Depkline plc  
Financial Statement Ratios  
(Problem 28)**

	2011	2012	2013
<b>Growth Rate in Sales</b> . . . . .	7.6%	8.5%	6.3%
<b>Profitability Ratios</b>			
Return on Assets . . . . .	18.8%	20.4%	18.6%
Profit Margin . . . . .	21.6%	23.2%	23.0%
Total Assets Turnover Ratio . . . . .	0.87	0.88	0.81
Return on Equity . . . . .	72.5%	64.3%	55.8%
Financial Leverage Ratio . . . . .	3.9	3.1	3.0
Accounts Receivable Turnover Ratio . . . . .	5.2	5.3	5.1
Inventory Turnover Ratio . . . . .	2.2	2.2	2.0
Fixed-Asset Turnover Ratio . . . . .	3.4	3.4	3.1
<b>Common-Size Income Statement</b>			
Sales . . . . .	100.0%	100.0%	100.0%
Investment Income . . . . .	1.6	1.7	2.2
Other Revenues . . . . .	1.7	1.2	1.9
Cost of Goods Sold . . . . .	(22.0)	(21.6)	(23.4)
Selling and Administrative . . . . .	(33.5)	(31.2)	(30.6)
Research and Development . . . . .	(14.5)	(14.9)	(14.6)
Other Operating Expenses . . . . .	(0.2)	(0.1)	(0.1)
Income Taxes . . . . .	(9.5)	(10.4)	(10.2)
Interest Expense (net of tax effect) . . . . .	(1.5)	(1.1)	(1.7)
<b>Short-Term Liquidity Risk Ratios</b>			
Current Ratio . . . . .	1.4	1.5	1.3
Quick Ratio . . . . .	1.0	1.0	0.9
Cash Flow from Operations to Current Liabilities . . . . .	66.1%	52.5%	70.9%
Days Accounts Receivable . . . . .	70	69	72
Days Inventory . . . . .	167	168	186
Days Accounts Payable . . . . .	120	105	100
<b>Long-Term Liquidity Risk Ratios</b>			
Liabilities to Assets Ratio . . . . .	72.2%	62.2%	68.0%
Long-Term Debt Ratio . . . . .	19.4%	18.7%	22.8%
Debt–Equity Ratio . . . . .	69.6%	49.5%	71.3%
Cash Flow from Operations to Total Liabilities Ratio . . . . .	32.6%	24.7%	33.7%
Interest Coverage Ratio . . . . .	15.6	22.6	14.0

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- a. What are the likely reasons for the increase in the profit margin during the three-year period from 2011 to 2013?
  - b. What are the likely reasons for the decreasing cost of goods sold to sales percentage combined with the increasing inventory turnover ratio during the three-year period?
  - c. What are the likely reasons for the increase in the fixed-asset turnover between 2012 and 2013?
  - d. The total assets turnover remained at 0.85 between 2011 and 2012, yet the accounts receivable, inventory, and fixed-asset turnovers increased. What is the likely explanation for the stable total assets turnover?
  - e. What are the likely explanations for the increase in the two cash flow ratios between 2011 and 2012?
  - f. What are the likely reasons for the decrease in the current and quick ratios between 2012 and 2013?
30. **Detective analysis—identify company.** Effective financial statement analysis requires an understanding of a firm's economic characteristics. The relations among various financial statement items provide evidence of many of these economic characteristics. **Exhibit 7.28**

**EXHIBIT 7.27**

**Scantania AB  
Financial Statement Ratios  
(Problem 29)**

	2011	2012	2013
<b>Growth Rate in Sales</b> . . . . .	11.5%	11.7%	19.4%
<b>Profitability Ratios</b>			
Return on Assets . . . . .	6.3%	7.1%	9.5%
Profit Margin . . . . .	7.4%	8.4%	10.1%
Total Assets Turnover Ratio . . . . .	0.85	0.85	0.94
Return on Equity . . . . .	20.7%	23.8%	33.6%
Financial Leverage Ratio . . . . .	3.3	3.3	3.5
Accounts Receivable Turnover Ratio . . . . .	1.97	2.03	2.16
Inventory Turnover Ratio . . . . .	4.92	5.21	5.79
Fixed-Asset Turnover Ratio . . . . .	2.51	2.65	3.02
<b>Common-Size Income Statement</b>			
Sales . . . . .	100.0%	100.0%	100.0%
Investment Income . . . . .	1.2	1.0	0.5
Net Financing Income . . . . .	1.6	1.4	1.3
Cost of Goods Sold . . . . .	(75.5)	(73.9)	(73.2)
Selling and Administrative . . . . .	(11.3)	(10.9)	(9.8)
Research and Development . . . . .	(3.9)	(4.3)	(4.0)
Income Taxes . . . . .	(3.7)	(4.1)	(4.2)
Interest Expense (net of tax effect) . . . . .	(1.0)	(0.9)	(0.6)
<b>Short-Term Liquidity Risk Ratios</b>			
Current Ratio . . . . .	1.2	1.2	1.0
Quick Ratio . . . . .	0.8	0.9	0.7
Cash Flow from Operations to Current Liabilities . . . . .	35.1%	37.5%	37.7%
Days Accounts Receivable . . . . .	186	179	169
Days Inventory . . . . .	74	70	63
Days Accounts Payable . . . . .	34	38	38
<b>Long-Term Liquidity Risk Ratios</b>			
Liabilities to Assets Ratios . . . . .	69.7%	70.3%	72.9%
Long-Term Debt Ratio . . . . .	24.7%	20.3%	21.7%
Debt-Equity Ratio . . . . .	81.4%	68.6%	80.1%
Cash Flow from Operations to Total Liabilities Ratio . . . . .	15.5%	19.1%	20.7%
Interest Coverage Ratio . . . . .	8.8	11.0	18.2

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presents common-size condensed balance sheets and income statements for 12 firms in different industries. These common-size balance sheets and income statements express various items as a percentage of operating revenues (that is, the statement divides all amounts by operating revenues for the year). A dash for a particular financial statement item does not necessarily mean that the amount is zero. It merely indicates that the amount is not sufficiently large for the firm to disclose it. The 12 companies, the country of their headquarters, and a brief description of their activities are as follows.

- (1) Accor (France): World’s largest hotel group, operating hotels under the names of Sofitel, Novotel, Motel 6, and others. Accor has grown in recent years by acquiring established hotel chains.
- (2) Arbed-Acier (Luxembourg): Offers flat-rolled steel products, primarily to the European automobile industry.
- (3) Carrefour (France): Operates grocery supermarkets and hypermarkets in Europe, Latin America, and Asia.
- (4) Deutsche Telekom (Germany): Europe’s largest provider of wired and wireless telecommunication services. The telecommunications industry has experienced increased deregulation in recent years.

**EXHIBIT 7.28**  
**Data for Ratio Detective Exercise**  
**(Problem 30)**

	1	2	3	4	5	6	7	8	9	10	11	12
<b>BALANCE SHEET AT END OF YEAR</b>												
Cash and Marketable Securities . . . . .	4.7%	16.4%	8.9%	8.4%	16.7%	7.4%	16.1%	21.3%	72.0%	8.3%	1.4%	338.8%
Receivables . . . . .	8.5	15.9	16.5	27.6	35.9	17.7	81.1	29.6	24.0	10.5	5.9	533.4
Inventories . . . . .	9.9	2.8	9.9	5.8	6.4	25.7	—	1.3	20.0	2.9	—	—
Property, Plant, and Equipment Cost . . . . .	40.8	20.9	59.0	69.6	88.3	130.9	23.0	110.3	83.3	278.9	535.4	15.3
Accumulated Depreciation . . . . .	(15.0)	(9.1)	(33.2)	(17.8)	(50.5)	(67.7)	(11.8)	(35.5)	(35.2)	(112.5)	(284.9)	(12.9)
Property, Plant, and Equipment, Net . . . . .	25.8	11.8	25.8	51.8	37.8	63.2	11.2	74.8	48.1	166.4	250.5	2.4
Intercorporate Investments . . . . .	4.0	14.3	3.0	0.6	18.8	10.3	1.3	10.7	7.7	22.4	16.9	41.9
Other Assets . . . . .	15.0	10.9	11.7	3.6	7.1	1.9	63.5	42.1	69.1	56.3	5.4	61.9
Total Assets . . . . .	67.9%	72.1%	75.8%	97.8%	122.7%	126.2%	173.2%	179.8%	240.9%	266.8%	280.1%	978.4%
Current Liabilities . . . . .	37.3%	25.5%	29.7%	26.4%	42.7%	34.5%	106.0%	65.1%	48.3%	42.6%	51.3%	820.8%
Long-Term Debt . . . . .	12.0	6.1	6.6	9.1	22.2	23.3	22.7	49.6	56.4	95.8	167.7	76.9
Other Noncurrent Liabilities . . . . .	2.1	1.8	5.9	2.3	4.2	17.2	10.6	10.9	24.5	27.8	24.7	42.2
Shareholders' Equity . . . . .	16.5	38.7	33.6	60.0	53.6	51.2	33.9	54.2	111.7	100.6	36.4	38.5
Total Liabilities and Shareholders' Equity . . . . .	67.9%	72.1%	75.8%	97.8%	122.7%	126.2%	173.2%	179.8%	240.9%	266.8%	280.1%	978.4%
<b>INCOME STATEMENT FOR YEAR</b>												
Operating Revenues . . . . .	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Other Revenues . . . . .	1.1%	2.7%	1.0%	0.2%	0.7%	2.3%	1.9%	0.3%	13.8%	0.7%	—	—
Cost of Goods Sold . . . . .	87.8	45.2	44.5	64.6	68.0	81.0	55.3	75.5	27.2	45.0	57.3	32.6
Depreciation and Amortization Expense . . . . .	3.0	4.9	4.1	3.2	5.9	5.3	2.0	7.1	9.9	23.9	19.9	—
Selling and Administrative Expense . . . . .	6.3	24.8	38.9	24.3	16.4	13.6	27.8	8.1	40.0	15.2	7.3	22.5
Interest Expense . . . . .	1.4	0.4	2.0	1.3	0.4	3.5	1.9	3.0	5.2	8.6	8.6	35.4
Research and Development Expense . . . . .	—	9.8	1.3	—	3.7	—	—	—	13.8	—	—	—
Income Tax Expense . . . . .	1.3	5.8	3.1	2.4	2.5	0.3	5.9	3.7	4.4	3.9	2.8	2.2
All Other Items (net) . . . . .	(0.8)	—	0.8	0.3	0.6	(2.1)	0.7	(1.1)	—	0.6	—	1.7
Total Expenses . . . . .	99.0%	90.9%	94.7%	96.1%	97.5%	101.6%	93.6%	96.3%	100.5%	97.2%	95.9%	94.4%
Net Income . . . . .	2.1%	11.8%	6.3%	4.1%	3.2%	0.7%	8.3%	4.0%	13.3%	3.5%	4.1%	5.6%

- (5) Fortis (Netherlands): Offers both insurance and banking services. Operating revenues include insurance premiums received, investment income, and interest revenue on loans. Operating expenses include amounts actually paid or amounts it expects to pay in the future on insurance coverage outstanding during the year.
- (6) Interpublic Group (United States): Creates advertising copy for clients. Purchases advertising time and space from various media and sells it to clients. Operating revenues represent the commission or fee earned by Interpublic for advertising copy created and media time and space sold. Operating expenses include compensation paid to employees. Interpublic acquired other marketing services firms in recent years.
- (7) Marks & Spencer (United Kingdom): Operates department stores in England and other retail stores in Europe and the United States. It offers its own credit card for customers' purchases.
- (8) Nestlé (Switzerland): World's largest food processor, offering prepared foods, coffees, milk-based products, and mineral waters.
- (9) Roche Holding (Switzerland): Creates, manufactures, and distributes a wide variety of prescription drugs.
- (10) Sun Microsystems (United States): Designs, manufactures, and sells engineering workstations and servers used to maintain integrated computer networks. Sun outsources the manufacture of many of its computer components.
- (11) Tokyo Electric Power (Japan): Provides electric power services, primarily to the Tokyo community. It maintains almost a monopoly position in its service area.
- (12) Toyota Motor (Japan): Manufactures automobiles and offers financing services to its customers.

Use whatever clues you can to match the companies in **Exhibit 7.28** with the companies and industries listed above.

31. **Preparing pro forma financial statements** (requires **Appendix 7.1**). **Problem 25** presents financial statements for Bullseye Corporation for its fiscal years ending December 31, 2011, 2012, and 2013, as well as financial statement ratios.
  - a. Prepare a set of pro forma financial statements for Bullseye Corporation for fiscal years 2014 through 2018 using the assumptions detailed below.
  - b. Describe actions that Bullseye might take to deal with the shortage of cash projected in part a.
  - c. What are the likely reasons for the projected changes in the return on equity?

### INCOME STATEMENT ASSUMPTIONS

1. Sales grew 12.2% in 2011 and 12.9% in 2012, primarily as a result of increases in the number of new stores and increases in sales of stores open more than one year. Sales grew only 6.3% in 2013 because of recession conditions. Although Bullseye Corporation will continue to increase the number of stores, economic conditions and competition will likely constrain increases in sales. Thus, assume that sales will grow 9% each year between 2014 and 2018.
2. Other revenues, representing interest on outstanding accounts receivable, have been approximately 3% of sales during the last three years. Assume that other revenues will continue at this historical rate.
3. The cost of goods sold to sales percentage increased slightly from 66.1% in 2011 to 68.2% in 2013. Assume that the cost of goods sold to sales percentage will be 68.1% for 2014 to 2018.
4. The selling and administrative expense percentage has increased slightly from 26.1% of sales in 2011 to 26.2% of sales in 2013. Bullseye will realize economies of scale as its growth rate in sales increases to 9% annually. Assume that the selling and administrative expense to sales percentage will be 26.0% for 2014 to 2018.
5. Bullseye Corporation has borrowed using long-term debt to construct new stores. The average interest rate on interest-bearing debt was approximately 4.4% during 2013. Assume this interest rate for all borrowing outstanding (long-term debt, and current portion of long-term debt) for Bullseye Corporation will be 5% for 2014 to 2018. Compute interest expense on the average amount of interest-bearing debt outstanding each year.

6. Bullseye Corporation's average income tax rate as a percentage of income before income taxes has varied around 38% during the last three years. Assume an income tax rate of 38% of income before income taxes for 2014 to 2018.
7. Bullseye Corporation's dividends increased at an average annual rate of 17.9% between 2011 and 2013. Assume that dividends will grow 16% each year between 2014 and 2018.

#### BALANCE SHEET ASSUMPTIONS

8. Cash will be the amount necessary to equate total assets with total liabilities plus shareholders' equity.
9. Accounts receivable will increase at the growth rate in sales.
10. Inventory will increase at the growth rate in sales.
11. Prepayments relate to ongoing operating costs, such as rent and insurance. Assume that prepayments will grow at the growth rate in sales.
12. Property, plant, and equipment grew 12.4% annually during the most recent three years. The construction of new stores will require additional investments in property, plant, and equipment, but not at the growth rate experienced in recent years. Assume that property, plant, and equipment will grow 10% each year between 2014 and 2018.
13. Other assets changed by only a small amount during the last three years. Assume that other assets will remain the same amount for 2014 to 2018 as the amount at the end of 2013.
14. The accounts payable turnover ratio increased from 5.9 in 2011 to 6.4 during 2013. Assume that Bullseye Corporation will increase its accounts payable turnover to 6.5 times per year for 2014 to 2018.
15. The notes to Bullseye Corporation's financial statements indicate that current maturities of long-term debt on December 31 of each year are as follows: 2013, \$1,964 (amount already appears on the December 31, 2013, balance sheet); 2014, \$1,951; 2015, \$1,251; 2016, \$2,236; 2017, \$107; 2018, \$2,251.
16. Other current liabilities relate to ongoing operating activities and are expected to grow at the growth rate in sales.
17. Bullseye Corporation uses long-term debt to finance acquisitions of property, plant, and equipment. Assume that long-term debt will decrease by the amount of long-term debt reclassified as a current liability each year and then the remaining amount will increase at the growth rate in property, plant, and equipment. For example, the December 31, 2013, balance sheet of Bullseye Corporation shows the current portion of long-term debt to be \$1,964. Bullseye Corporation will repay this amount during 2014. During 2014, Bullseye will reclassify \$1,951 from long-term debt to current portion of long-term debt (see item 15 above). This will leave a preliminary balance in long-term debt of \$14,988 ( $= \$16,939 - \$1,951$ ). Bullseye Corporation will increase this amount of long-term debt by the 10% growth rate in property, plant, and equipment. The projected amount for long-term debt on the December 31, 2014, balance sheet is \$16,487 ( $= \$14,988 \times 1.1$ ).
18. Other noncurrent liabilities include an amount related to retirement benefits and taxes due after more than one year. Assume that other noncurrent liabilities will increase at the growth rate in sales.
19. Assume that common stock and additional paid-in capital will not change.
20. Assume that accumulated other comprehensive income will grow at the growth rate in sales.

#### STATEMENT OF CASH FLOW ASSUMPTIONS

21. Assume that depreciation expense will increase at the growth rate in property, plant, and equipment.
22. Assume that changes in other noncurrent liabilities and in accumulated other comprehensive income on the balance sheet are operating activities.
23. Assume that the amount for Other Financing Transactions is zero for 2014 to 2018.