## Review 3-2—Solution

| | Balance Sheet | | | | | Income Statement | | |
|---|---|---|---|---|---|---|---|---|
| | Cash Assets + | Noncash Assets = | Liabilities + | Contrib. Capital + | Earned Capital | Revenues − | Expenses = | Net Income |
| Balance January 1, 2017 | 10,000 | 41,000 | 26,000 | 10,000 | 15,000 | 0 | 0 | 0 |
| **Transactions** | | | | | | | | |
| 1. Issue common stock for $3,000 cash | 3,000 | | | 3,000 | | | | |
| 2. Purchase inventory for $8,000 on credit | | 8,000 Inventory | 8,000 Accounts payable | | | | | |
| 3. Sell inventory costing $8,000 for $15,000 on credit | | (8,000) Inventory<br>15,000 Accounts receivable | | | 7,000 | 15,000 Revenue | 8,000 Cost of goods sold | 7,000 |
| 4. Issue long-term debt for $10,000 cash | 10,000 | | 10,000 Long-term debt | | | | | |
| 5. Pay $15,000 cash for PPE | (15,000) | 15,000 PPE | | | | | | |
| 6. Pay $500 cash for salaries | (500) | | | | (500) | | 500 Salaries expense | (500) |
| 7. Receive $300 cash in advance for future consulting services | 300 | | 300 Unearned revenue | | | | | |
| 8. Pay $50 cash for interest on long-term debt | (50) | | | | (50) | | 50 Interest expense | (50) |
| 9. Receive $3,000 cash from accounts receivable | 3,000 | (3,000) Accounts receivable | | | | | | |
| 10. Pay $2,500 cash toward accounts payable | (2,500) | | (2,500) Accounts payable | | | | | |
| 11. Perform consulting services for client who previously paid in 7 | | | (300) Unearned revenue | | 300 | 300 Revenue | | 300 |
| 12. Pay $100 cash for dividends | (100) | | | | (100) | | | |

## Review 3-3—Solution

| | Balance Sheet | | | | | Income Statement | | |
|---|---|---|---|---|---|---|---|---|
| | Cash Assets + | Noncash Assets = | Liabilities + | Contrib. Capital + | Earned Capital | Revenues − | Expenses = | Net Income |
| **Accounting Adjustments** | | | | | | | | |
| 13. Record depreciation of $600 | | (600) PPE | | | (600) | | 600 Depreciation expense | (600) |
| 14. Accrue salaries of $1,000 | | | 1,000 Salaries payable | | (1,000) | | 1,000 Salaries expense | (1,000) |
| 15. Advertising costing $1,300 is aired | | (1,300) Prepaid expense | | | (1,300) | | 1,300 Advertising expense | (1,300) |
| 16. Accrue income taxes of $1,200 | | | 1,200 Taxes payable | | (1,200) | | 1,200 Tax expense | (1,200) |
| **Balance January 31, 2017** | 8,150 | 66,100 | 43,700 | 13,000 | 17,550 | 15,300 | 12,650 | 2,650 |

As for all ratios, analysis of financial leverage ratios must consider ratios over time and comparisons with peers. Appropriate financial leverage varies across industries because different business models generate cash flow streams that differ in amount and variability over time. Generally, business models that generate high and stable levels of cash flow can support a higher level of debt.

The median total liabilities-to-equity ratio for all publicly traded companies in 2015 was 0.71, indicating that companies typically borrow money, but have more equity than borrowed money in their capital structures. Financial leverage ratios differ by industry and company size. The median financial leverage ratio for the S&P 500 companies, for example, was 2.74 in 2015 and ranged from 2.4 to 2.7 over the 2011–2015 period.

Exhibit 4.4 shows a summary of ratios used in the DuPont disaggregation of return on equity.

**Exhibit 4.4 ■ Summary of Ratios in DuPont Disaggregation of Return on Equity**

| Ratio | Computation | What The Ratio Measures | Positive Indicators Include |
|---|---|---|---|
| **Return on equity** | Net income ÷ Avg. stockholders' equity, or Return on assets × Financial leverage | ROE measures accounting return to shareholders using net income and the book value of stockholders' equity. | ▪ Improvement over time and favorable comparison to peers.<br>▪ Greater proportion of ROE from ROA (operations) than financial leverage (risk). |
| **Return on assets** | Net income/Avg. total assets or Profit margin × Asset turnover | ROA measures the accounting return on total assets using net income and total assets. | ▪ Improvement over time in both profit margin and asset turnover.<br>▪ Improvement in gross margins and not solely from expense reduction. |
| **PROFITABILITY** | | | |
| Gross profit margin | Gross profit / Sales | Gross profit measures the difference between selling price and the cost to make or buy the products sold for the year. | ▪ Improvement over time due to increases in selling prices and/or reductions in cost to make or buy without compromising product quality.<br>▪ Favorable comparison to peers. |
| Operating expense margin (or SG&A expense margin) | SG&A expense / Sales | Operating expense margin measures total overhead expense (SG&A) as a percent of sales. | ▪ Improvement over time.<br>▪ Favorable comparison to peers.<br>▪ No short-term gains at long-term cost (such as unusual reductions in marketing and R&D expenses). |
| Profit margin (or net profit margin) | Net income / Sales | Profit margin includes effects of both gross profit margin, the operating expense margin, and net nonoperating expenses. | ▪ Improvement over time.<br>▪ Favorable comparison to peers. |
| **PRODUCTIVITY** | | | |
| Accounts receivable turnover | Sales / Avg. accounts receivable | AR turnover reflects how effective a company manages the credit issued to customers. | ▪ Improvement over time.<br>▪ Favorable comparison to peers. |
| Days sales outstanding (DSO) | 365 × (Avg. accounts receivable / Sales) | DSO reflects how well a company's accounts receivables are managed. | ▪ Maintain sales while reducing days to collect receivables. |
| Inventory turnover | COGS / Avg. inventory | Inventory turnover reflects the number of times inventory is sold or used during the period. | ▪ Improvement over time.<br>▪ Favorable comparison to peers. |
| Days inventory outstanding (DIO) | 365 × Avg. inventory/COGS | DIO reflects how many days it takes for a company to sell its inventory. | ▪ Maintain sales while reducing days to sell inventory. |
| Accounts payable turnover | COGS ÷ Avg. accounts payable | AP turnover reflects how many times a company pays off its suppliers during the period. | ▪ Improvement over time.<br>▪ Favorable comparison to peers. |
| Days payables outstanding (DPO) | 365 × (Avg. accounts payable/COGS) | DPO reflects how long it takes a company to pay its invoices from suppliers. | ▪ Maintain supplier relations while delaying payment to suppliers. |
| Cash conversion cycle | AR days + Inv days − AP days | Cash conversion (operating) cycle measures the days to convert cash to inventories, receivables to cash, cash to payables. | ▪ Improvement over time.<br>▪ Favorable comparison to peers. |
| PPE turnover | Sales / Avg. PPE assets | Plant asset turnover is a productivity measure, comparing the volume of sales generated by plant assets. | ▪ Improvement over time.<br>▪ Favorable comparison to peers. |

*continued*

| $ millions | ROA (DuPont analysis) | RNOA (Operating focus) | Computation |
|---|---|---|---|
| Net income | $11,420 | | |
| Net operating profit after tax (NOPAT) | | $11,288 | |
| Average assets | $97,483 | | ($103,065 + $91,900)/2 |
| Average net operating assets (NOA) | | $49,373 | ($51,488 + $47,258)/2 |
| ROA | 11.71% | | $11,420 / $97,483 |
| RNOA | | 22.86% | $11,288 / $49,373 |

**ROA Components** The operating focus to ROE excludes $132 million of net income (relating to investment returns net of interest expense, after tax) and excludes $9,102 million of net nonoperating assets (average investment securities of $28,169 million less average nonoperating liabilities of $19,067 million, computed as [$2,634 +$20,933 +$1,596 +$12,971]/2). The net return on these net nonoperating assets is 1.45% $\left(\frac{\$132 \text{ million}}{\$9{,}102 \text{ million}}\right)$. The return on assets computed under the traditional DuPont approach is actually a weighted average of the return on operating assets and the return on net nonoperating assets ($ millions).

$$\underbrace{\left(22.86\% \times \frac{\$49{,}373}{\$97{,}483}\right)}_{\text{From Operating Activities}} + \underbrace{\left(1.45\% \times \frac{\$9{,}102}{\$97{,}483}\right)}_{\text{From Nonoperating Activities}} = 11.71\%$$

It is clear that both sides of Intel's business create positive returns for shareholders—operations are returning 22.86% and nonoperating activities are returning 1.45%. But the low return on nonoperating activities creates a drag on overall return to the shareholders. This insight is lost with the traditional DuPont analysis. Exhibit 4.8 summarized the key metrics applied in this section. We now extend the operating focus to the second level of analysis for each component of RNOA.

**Exhibit 4.8 ■ Key Ratio and Acronym Definitions**

| Ratio | | Definition |
|---|---|---|
| **ROE:** | **Return on equity** | Net income attributable to controlling interest/Average equity attributable to controlling interest |
| **NOA:** | **Net operating assets** | Operating assets less operating liabilities; it excludes nonoperating items such as investments in marketable securities and interest-bearing debt. |
| **NOPAT:** | **Net operating profit after tax** | Operating revenues less operating expenses such as cost of sales, selling, general and administrative expense, and taxes; it excludes nonoperating revenues and expenses such as interest revenue, dividend revenue, interest expense, gains and losses on investments, discontinued operations. |
| **RNOA:** | **Return on net operating assets** | NOPAT / Average NOA |

## Net Operating Profit Margin

**Net operating profit margin (NOPM)** reveals how much operating profit the company earns from each sales dollar. All things equal, a higher net operating profit margin is preferable. Net operating profit margin is affected by the level of gross profit the company earns on its products (revenue minus cost of goods sold), which depends on product prices and manufacturing or purchase costs. Net operating profit margin is also affected by the level of operating expenses the company requires to support its products or services. This includes overhead costs such as wages, marketing, occupancy, and research and development. Finally, net operating profit margin is affected by the level of competition (which affects product pricing) and the company's willingness and ability to control costs.

Intel's net operating profit margin is computed as follows ($ millions).

$$\text{Net operating profit margin} = \frac{\text{Net operating profit after tax}}{\text{Sales}} = \frac{\$11,288}{\$55,355} = 20.39\%$$

This result means that for each dollar of sales at Intel, the company earns roughly 20.39¢ profit after all operating expenses and taxes. As a reference, the median NOPM for U.S. publicly traded companies with revenues greater than $1 billion in 2015 is about 8¢.

Analysis of net operating profit margin examines the ratio over time and in comparison with peers. As with net profit margin in the DuPont analysis, the net operating profit margin includes effects from the gross profit margin (Gross profit/Sales) and the operating expense margin (Operating expenses/Sales). A second level analysis of net operating profit margin examines these components to uncover underlying trends that drive this ratio.

## Net Operating Asset Turnover

**Net operating asset turnover (NOAT)** measures the productivity of the company's net operating assets. This metric reveals the level of sales the company realizes from each dollar invested in net operating assets. All things equal, a higher NOAT is preferable. Intel's net operating asset turnover ratio follows ($ millions).

$$\text{Net operating asset turnover} = \frac{\text{Sales}}{\text{Average net operating assets}} = \frac{\$55,355}{(\$51,488 + \$47,258)/2} = 1.12$$

This result means that for each dollar of net operating assets, Intel realizes $1.12 in sales. As a reference, the median for U.S. publicly traded companies with revenues greater than $1 billion in 2015 is about $1.30.

Net operating asset turnover can be increased by either increasing sales for a given level of investment in operating assets, or by reducing the amount of operating assets necessary to generate a dollar of sales, or both. Reducing operating working capital (current operating assets less current operating liabilities) is usually easier than reducing long-term net operating assets. For example, companies can implement strategies to collect their receivables faster, reduce their inventories, and delay payments to their suppliers. All of these actions reduce operating working capital and, thereby, increase NOAT. These strategies must be managed, however, so as not to negatively impact sales or supplier relations. Working capital management is an important part of managing the company effectively.

It is usually more difficult to reduce the level of long-term net operating assets. The level of PPE required by the company is determined more by the nature of the company's business model than by management action. For example, telecommunications companies require more capital investment than do retail stores. Still, there are several actions that managers can take to reduce capital investment. Some companies pursue novel approaches, such as corporate alliances, outsourcing, and use of special purpose entities; we discuss some of these approaches in later modules.

Analysis of net operating asset turnover examines the ratio over time and in comparison with peers. As with asset turnover in the DuPont analysis, the net operating asset turnover includes effects

| Company | Ticker | 2015 Sales | 2015 Net Income | 2015 Net Operating Profit After Tax | 2015 Net Operating Assets | 2014 Net Operating Assets | 2015 Stockholders' Equity | 2014 Stockholders' Equity |
|---|---|---|---|---|---|---|---|---|
| Macy's . . . | M | $27,079 | $1,072 | $1,297 | $10,781 | $10,441 | $4,250 | $5,378 |

*a.* Compute the 2015 return on equity (ROE) and 2015 return on net operating assets (RNOA).
*b.* Disaggregate RNOA into net operating profit margin (NOPM) and net operating asset turnover (NOAT). What observations can we make about Macy's NOPM and NOAT?
*c.* Compute the percentage of RNOA to ROE, and compute Macy's nonoperating return for 2015.

**E4-36. Compute and Compare ROE, ROA, and RNOA** LO1, 2, 6 Oracle (ORCL)

Refer to the balance sheet and income statement information for **Oracle Corporation** in E4-34.

*a.* Compute return on equity (ROE).
*b.* Compute return on net assets (ROA).
*c.* Compute return on net operating assets (RNOA).
*d.* Compare the three return metrics and explain what each one measures.

**E4-37. Compute and Interpret Liquidity and Solvency Ratios** LO9 Comcast Corporation (CMCSA)

Selected balance sheet and income statement information from **Comcast Corporation** for 2015 and 2014 follows ($ millions).

| | Total Current Assets | Total Current Liabilities | Income Before Interest and Taxes | Interest Expense | Total Liabilities* | Stockholders' Equity |
|---|---|---|---|---|---|---|
| 2015 . . . . | $12,303 | $18,178 | $15,673 | $2,702 | $112,596 | $53,978 |
| 2014 . . . . | 13,531 | 17,410 | 15,001 | 2,617 | 106,118 | 53,068 |

*Includes redeemable noncontrolling interests

*a.* Compute the current ratio for each year and discuss any trend in liquidity. Do you believe the company is sufficiently liquid? Explain. What additional information about the accounting numbers comprising this ratio might be useful in helping you assess liquidity? Explain.
*b.* Compute times interest earned and the liabilities-to-equity ratio for each year and discuss any noticeable change.
*c.* What is your overall assessment of the company's liquidity and solvency from the analyses in parts a and b? Explain. *Hint:* Compare the ratios for Comcast to those provided in the module for publicly traded companies.

**E4-38. Compute and Interpret Liquidity and Solvency Ratios** LO9 Verizon Communications Inc. (VZ)

Selected balance sheet and income statement information from **Verizon Communications Inc.** for 2015 and 2014 follows ($ millions).

| | Total Current Assets | Total Current Liabilities | Income Before Interest and Taxes | Interest Expense, Gross | Total Liabilities | Stockholders' Equity |
|---|---|---|---|---|---|---|
| 2015 . . . . | $22,280 | $35,052 | $32,974 | $4,920 | $226,798 | $17,842 |
| 2014 . . . . | 29,499 | 27,987 | 21,379 | 4,915 | 218,940 | 13,676 |

*a.* Compute the current ratio for each year and discuss any trend in liquidity. Do you believe the company is sufficiently liquid? Explain. What additional information about the accounting numbers comprising this ratio might be useful in helping you assess liquidity? Explain.
*b.* Compute times interest earned and the liabilities-to-equity ratio for each year and discuss any noticeable change.
*c.* What is your overall assessment of the company's liquidity and solvency from the analyses in parts *a* and *b*? Explain.

# Solutions to Review Problems

## Review 4-1—Solution ($ millions)

$$\text{ROE} = \frac{\$8,981}{(\$59,698 + \$56,654)/2} = 15.44\%$$

## Review 4-2—Solution ($ millions)

ROE = Return on assets (ROA) × Financial leverage

$$\text{ROA} = \frac{\$8,981}{(\$113,481 + \$105,070)/2} = 8.22\% \qquad \text{Financial leverage} = \frac{(\$113,481 + \$105,070)/2}{(\$59,698 + \$56,654)/2} = 1.878$$

8.22% × 1.878 = 15.44% = ROE

## Review 4-3—Solution ($ millions)

*a.* $$\text{ROA} = \frac{\$8,981}{(\$113,481 + \$105,070)/2} = 8.22\%$$

$$\text{PM} = \frac{\$8,981}{\$49,161} = 18.27\%$$

$$\text{AT} = \frac{\$49,161}{(\$113,481 + \$105,070)/2} = 0.45$$

ROA = Profit Margin (PM) × Asset Turnover (AT)

8.22% = 18.27% × 0.45

*b.* ($49,161 − $19,480)/$49,161 = 60.38%

*c.* Days sales outstanding = 365 × [($5,344 + $5,157)/2]/$49,161 = 38.98

Days inventory outstanding = 365 × [($1,627 + $1,591)/2]/$19,480 = 30.15

Days accounts payable outstanding = 365 × [($1,104 + $1,032)/2]/$19,480 = 20.01

Cash conversion cycle = 38.98 + 30.15 − 20.01 = 49.12

*d.* ($53,774/$59,707) = 0.90

## Review 4-4—Solution ($ millions)

*a.*

| $ millions | July 25, 2015 | July 26, 2014 |
|---|---|---|
| Accounts receivable, net | $ 5,344 | $ 5,157 |
| Inventories | 1,627 | 1,591 |
| Financing receivables, net | 4,491 | 4,153 |
| Deferred tax assets | 2,915 | 2,808 |
| Other current assets | 1,490 | 1,331 |
| Property and equipment, net | 3,332 | 3,252 |
| Financing receivables, net | 3,858 | 3,918 |
| Goodwill | 24,469 | 24,239 |
| Purchased intangible assets, net | 2,376 | 3,280 |
| Other assets | 3,163 | 3,267 |
| Total operating assets | $53,065 | $52,996 |
| | | |
| Accounts payable | $ 1,104 | $ 1,032 |
| Income taxes payable | 62 | 159 |
| Accrued compensation | 3,049 | 3,181 |
| Deferred revenue | 9,824 | 9,478 |
| Other current liabilities | 5,687 | 5,451 |
| Income taxes payable | 1,876 | 1,851 |
| Deferred revenue | 5,359 | 4,664 |
| Other long-term liabilities | 1,459 | 1,748 |
| Total operating liabilities | $28,420 | $27,564 |

| Year Ended ($ millions) | December 31, 2013 |
|---|---|
| Revenues | $51,584 |
| Pre-tax income from discontinued operations | 408 |
| Provision for taxes on income | 100 |
| Income from discontinued operations—net of tax | 308 |
| Pre-tax gain on disposal of discontinued operations | 10,446 |
| Provision for taxes on income | 92 |
| Gain on disposal of discontinued operations—net of tax | 10,354 |
| Discontinued operations—net of tax | $10,662 |

Discontinued operations are segregated in the income statement because they represent a *transitory* item; that is, transactions or events that affect the current period (and in prior periods while the operation was owned by the company) but will not recur. Many readers of financial statements analyze current-year financial statements to gain clues to better predict *future* performance (stock prices, for example, are based on a company's expected profits and cash flows). Although the segregation of transitory items can help us analyze past performance to uncover core operating profit, they are largely irrelevant to predicting future performance. This means investors and other users tend to focus on income from continuing operations because that is the level of profitability that is likely to *persist* (continue) into the future. Likewise, the financial press tends to focus on income from continuing operations when it discloses corporate earnings (often described as "earnings before one-time charges").

Accounting standards relating to discontinued operations have recently changed and have restricted the types of disposals that will be accounted for as discontinued operations. Under the new accounting standard, in order to be classified as a discontinued operation, the disposal of the business unit must represent a *strategic shift* for the company that has or will have a *major effect* on a company's financial results. This represents a substantial hurdle because the company will have to demonstrate that a divestiture represents a strategic shift and creates large financial effects. Consequently, the reporting of discontinued operations is likely to be less frequent in the future.

## LO6 Review 5-6

**Abbott Laboratories** reported the following income statement for fiscal 2015.


| ABBOTT LABORATORIES AND SUBSIDIARIES<br>Consolidated Statement of Earnings ($ millions)<br>For Year Ended December 31, 2015 | |
|---|---|
| Net sales | $20,405 |
| Cost of products sold | 8,747 |
| Amortization of intangible assets | 601 |
| Research and development | 1,405 |
| Selling, general, and administrative | 6,785 |
| Total operating cost and expenses | 17,538 |
| Operating earnings | 2,867 |
| Other (income) expense, net | (316) |
| Earnings from continuing operations before taxes | 3,183 |
| Taxes on earnings from continuing operations | 577 |
| Earnings from continuing operations | 2,606 |
| Earnings from discontinued operations, net of taxes | 65 |
| Gain on sale of discontinued operations, net of taxes | 1,752 |
| Net earnings from discontinued operations, net of taxes | 1,817 |
| Net earnings | $ 4,423 |

*continued*

| For the Fiscal Years Ended October 31 ($ millions) | 2015 | 2014 | 2013 |
|---|---|---|---|
| **Allowance for doubtful accounts—accounts receivable** | | | |
| Balance, beginning of period | $232 | $332 | $464 |
| Provision for doubtful accounts | 46 | 25 | 23 |
| Deductions, net of recoveries | (89) | (125) | (155) |
| Balance, end of period | $189 | $232 | $332 |

*a.* What is the gross amount of accounts receivables for Hewlett-Packard in fiscal 2015 and 2014?
*b.* What is the percentage of the allowance for doubtful accounts to gross accounts receivable for 2015 and 2014?
*c.* What amount of bad debts expense did Hewlett-Packard report each year 2013 through 2015 (ignore increase in allowance from acquisitions)? How does bad debts expense compare with the amounts of its accounts receivable actually written off? (Identify the amounts, and explain.)
*d.* Explain the changes in the allowance for doubtful accounts from 2013 through 2015. Does it appear that Hewlett-Packard increased or decreased its allowance for doubtful accounts in any particular year beyond what seems reasonable?

LO5 **E5-44. Estimating Bad Debts Expense and Reporting Receivables**

At December 31, Barber Company had a balance of $420,000 in its accounts receivable and an unused balance of $2,600 in its allowance for uncollectible accounts. The company then aged its accounts as follows.

| | |
|---|---|
| Current | $346,000 |
| 1–60 days past due | 48,000 |
| 61–180 days past due | 17,000 |
| Over 180 days past due | 9,000 |
| Total accounts receivable | $420,000 |

The company has experienced losses as follows: 1% of current balances, 5% of balances 1–60 days past due, 15% of balances 61–180 days past due, and 40% of balances over 180 days past due. The company continues to base its allowance for uncollectible accounts on this aging analysis and percentages.

*a.* What amount of bad debts expense does Barber report on its income statement for the year?
*b.* Show how Barber's December 31 balance sheet will report the accounts receivable and the allowance for uncollectible accounts.

LO5 **E5-45. Estimating Uncollectible Accounts and Reporting Receivables over Multiple Periods**

Weiss Company, which has been in business for three years, makes all of its sales on credit and does not offer cash discounts. Its credit sales, customer collections, and write-offs of uncollectible accounts for its first three years follow.

| Year | Sales | Collections | Accounts Written Off |
|---|---|---|---|
| 2014 | $733,000 | $716,000 | $5,300 |
| 2015 | 857,000 | 842,000 | 5,800 |
| 2016 | 945,000 | 928,000 | 6,500 |

*a.* Weiss recognizes bad debts expense as 1% of sales. (*Hint:* This means the allowance account is increased by 1% of credit sales regardless of any write-offs and unused balances.) What does Weiss' 2016 balance sheet report for accounts receivable and the allowance for uncollectible accounts? What total amount of bad debts expense appears on Weiss' income statement for each of the three years?
*b.* Comment on the appropriateness of the 1% rate used to provide for bad debts based on your analysis in part *a*.

# Solutions to Review Problems

## Review 5-1—Solution

**Part I**

1. Revenue is recognized for the sales price less anticipated returns.
2. The purchase price is apportioned between two components (performance obligations): the value of the copier and the value of the two-year service agreement. Revenue is immediately recognized on the first component. For the second component, revenue is deferred and recognized ratably over two years.
3. Revenue is recognized ratably over the year despite the fact that customers pay up front.
4. Revenue is recognized for the commission only, not the full sales price, because the company is acting as an agent for the other companies.
5. Product sales are recognized as revenue when the product is delivered to the franchisee. Accounting services are recognized as revenue on a monthly basis as the service is provided.

**Part II**

1. Revenue = $3,000,000 × ($500,000/$2,500,000) = $600,000.

   Gross profit = $600,000 − $500,000 = $100,000.
2. The cost of $500,000 exceeds the billing of $400,000, and the excess of $100,000 is reported as a current asset (such as costs in excess of billings or contracts in progress).

## Review 5-2—Solution

1. "Additions" represents the amount of returns allowances recorded during fiscal 2015 for sales during that year.
2. "Returns, net" is the dollar value of actual returns offset by the value of the merchandise returned. The actual returns number is very close to the amount estimated. This indicates that Nordstrom is fairly accurate in its estimation process.
3. *a.* Sales returns/gross sales shows an increasing pattern. The ratio is up from 13.4% two years ago to 16.2% in the most current year. This could indicate that customer satisfaction with products is decreasing. However, Nordstrom's business model focuses on customer satisfaction, and the fact that its margin is very high (35% in 2015) puts the increase in perspective—it is not alarming, but should be monitored.

| $ millions | 2015 | 2014 | 2013 |
|---|---|---|---|
| Net sales | $14,095 | $13,110 | $12,166 |
| Year-end allowance for sales returns | 2,720 | 2,129 | 1,880 |
| Gross sales | $16,815 | $15,239 | $14,046 |
| % Returned merchandise | 16.2% | 14.0% | 13.4% |

*b.* Nordstrom's allowance is adequate considering the following ratio of actual to estimate:

| $ millions | 2015 | 2014 | 2013 |
|---|---|---|---|
| Actual returns during the year | $2,710 | $2,097 | $1,868 |
| Estimated returns for the year | $2,720 | $2,129 | $1,880 |
| Adequacy | 99.6% | 98.5% | 99.4% |

There is normal tension between the sales side of a company that argues for depth and breadth of inventory, and the finance side that monitors inventory carrying costs and seeks to maximize cash flow. Companies, therefore, seek to *optimize* inventory investment, not minimize it.

## Days Payable Outstanding

Most companies purchase inventories on credit, meaning that suppliers allow companies to pay later. The supplier sets credit terms that specify when the invoice must be paid. Sometimes the supplier will offer a discount if the company pays more quickly. A typical invoice might include payment terms of 2/10, net 30, which means that the seller offers a 2% discount if the invoice is paid within 10 days and, if not, requires payment in full to be made in 30 days. Business-to-business (B2B) payables are usually non-interest bearing. This means accounts payable represent a low-cost financing source and companies should defer payment as long as allowed by the vendor. The average length of time that payables are deferred is reflected in the **days payable outstanding (DPO)** ratio, computed as:

$$\text{Days payable outstanding} = \frac{365 \times \text{Average Accounts Payable}}{\text{COGS}}$$

Similar to the days inventory outstanding ratio, COGS is in the denominator because payables relate to the purchase of inventories, which are reported at cost. For Home Depot, days payable outstanding for 2016 is:

$$\text{Days payable outstanding} = \frac{365 \times (\$6{,}565 + \$5{,}807)/2}{\$58{,}254} = 38.8 \text{ days}$$

This means Home Depot pays its suppliers in 38.8 days, on average. This is slightly longer than the typical supplier payment terms of 30 days.

Delaying payment to suppliers allows the purchasing company to increase its available cash (in other words, reduce its necessary level of cash). However, excessive delays (called "leaning on the trade") can damage supplier relationships. Remember, the purchaser's days payable outstanding is the seller's days sales outstanding in accounts receivable—this means as the purchaser gains cash from delaying payment, the seller loses an equal amount. As such, if delays become excessive, sellers might increase product cost or even choose to not sell to the purchaser. In managing the days accounts payable outstanding, companies must take care to maximize available cash while minimizing supply-chain disruption.

## Cash Conversion Cycle

The cash conversion cycle is defined as:

Days sales outstanding (accounts receivable)
\+ Days inventory outstanding
− Days payable outstanding
= Cash conversion cycle

Each time a company completes one cash conversion cycle, it has purchased and sold inventory (realizing sales and gross profit), and paid accounts payable and collected accounts receivable. The cycle increases cash flow (unless the sales are not-profitable). The aim is to minimize the time to complete a cycle.

Home Depot's cash conversion cycle for the 2012–2016 period follows.

| Amounts in days | 2016 | 2015 | 2014 | 2013 | 2012 |
|---|---|---|---|---|---|
| Days sales outstanding | 6.96 | 6.32 | 6.47 | 6.45 | 6.04 |
| + Days inventory outstanding | 71.70 | 73.74 | 76.55 | 78.49 | 82.88 |
| − Days payable outstanding | (38.76) | (38.65) | (39.29) | (38.18) | (37.87) |
| = Cash conversion cycle | 39.90 | 41.41 | 43.73 | 46.76 | 51.05 |

*a. Present values for Years 1 through 5.* The present value of lease payment for Years 1 through 5 is computed for each of the first 5 years using the =pv function in Excel. This is shown in rows 2 through 6 in Exhibit 10.2.

*b. Present value for Year 6 and thereafter.* To compute the present value of the lease payments remaining after Year 5, we make an assumption that the company continues to make lease payments at the Year 5 level for the remainder of the lease term. The remaining lease term is, therefore, estimated as: (Total payments for Year 6 and thereafter)/(Year 5 lease payment) as shown in cell B9 in Exhibit 10.2. This means the remaining payments are an annuity for the remainder of the lease term and we use the Excel present value function for an annuity ("pmt") to determine the present value of the remaining lease payments. This present value is the value of the remaining payments at the beginning of Year 6. What we seek is the present value of those payments at the beginning of Year 1. Thus, we multiply by the present value of a lump sum. See cell E7 in Exhibit 10.2 for the Excel cell definition. The algebraic formula for this is computed as:

$$\$307 \text{ million} \times \frac{1-[1/(1.0394)^{4.98}]}{0.0394} \times \frac{1}{(1.0394)^5}$$

We sum the present values of Year 1 through Year 5 payments and the present value of the payments in Year 6 and beyond to obtain the present value of future operating lease payments; for Southwest, this totals $3,188 million (computed as $536 + $504 + $422 + $349 + $253 + $1,124, as shown in cell D8 in Exhibit 10.2).

**Step ❸** Use the computed present value of future operating lease payments to adjust the balance sheet, income statement, and financial ratios as we illustrate below.

**Financial Statement Adjustments** Failure to capitalize operating leases affects ratio analysis. In Step 2 above, we quantified the assets and liabilities missing from the balance sheet, as $3,188 million. To adjust the balance sheet, we add $3,188 million to both assets and liabilities as illustrated in Exhibit 10.3. Capitalizing the operating leases has a marked impact on Southwest's balance sheet because lease assets (airplanes and real estate) comprise a large portion of the company's net operating assets. All airline companies and many retailers have equally large off-balance-sheet assets and liabilities.

## Business Insight ■ Imputed Discount Rate Computation for Leases

When companies report both operating and capital leases, we can use disclosures in the lease footnote to impute the average interest rate used to discount capital leases. **Southwest Airlines** reports total undiscounted minimum capital lease payments of $435 million and a discounted value for those lease payments of $356 million. Using Excel, we estimate the discount rate that Southwest used for its capital lease computations with the IRR function, written as "= IRR(values,guess)", as shown in the following spreadsheet. The entries in cells B2 through G2 are taken from Southwest's lease footnote shown earlier in this section. Cells H2 through L2 sum to $209 million, the total lease payments due after 2020 (year 5). We assume that Southwest continues to pay $44 million per year (the same as in 2019) with a final payment of $33 million, until the $209 million is used up. The spreadsheet estimates that Southwest Airlines implicitly used a discount rate of 3.94% to capitalize leases in its 2015 balance sheet.

H14 ⋮ × ✓ *fx*

| | A | B | C | D | E | F | G | H | I | J | K | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | N | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| 2 | Amount | −356 | 46 | 46 | 45 | 45 | 44 | 44 | 44 | 44 | 44 | 33 | |
| 3 | IRR | 3.94% | | | | | | | | | | | |
| 4 | 4 | | | | | | | | | =209 | | | |
| 5 | | *Formula for cell B3 is IRR(B2:L2,.1) | | | | | | | | | | | |

LO2

Xerox Corporation (XRX)

Homework MBC

**E10-34. Analyzing and Interpreting Pension and Health Care Footnote**

Xerox Corporation reports the following pension and retiree health care ("Other") footnote as part of its 10-K report.

| December 31, 2015 ($ millions) | Pension Benefits | Retiree Health |
|---|---|---|
| **Change in Benefit Obligation** | | |
| Benefit obligation, January 1 | $11,855 | $ 937 |
| Service cost | 36 | 7 |
| Interest cost | 295 | 34 |
| Plan participants' contributions | 4 | 14 |
| Actuarial loss | (332) | (4) |
| Currency exchange rate changes | (538) | (25) |
| Plan amendments and curtailments | (17) | (31) |
| Benefits paid/settlements | (638) | (77) |
| **Benefit obligation, December 31** | $10,665 | $ 855 |
| **Change in Plan Assets** | | |
| Fair value of plan assets, January 1 | $ 9,214 | $ — |
| Actual return on plan assets | (89) | — |
| Employer contribution | 309 | 63 |
| Plan participants' contributions | 4 | 14 |
| Currency exchange rate changes | (440) | — |
| Benefits paid/settlements | (638) | (77) |
| Other | (4) | — |
| **Fair value of plan assets, December 31** | $ 8,356 | $ — |
| **Net funded status at December 31** | $(2,309) | $(855) |

| December 31, 2015 ($ millions) | Pension Benefits | Retiree Health |
|---|---|---|
| **Components of Net Periodic Benefit Cost** | | |
| Service cost | $ 36 | $ 7 |
| Interest cost | 295 | 34 |
| Expected return on plan assets | (376) | — |
| Recognized net actuarial loss | 96 | 1 |
| Amortization of prior service credit | 2 | (18) |
| Recognized settlement loss | 89 | — |
| Recognized curtailment gain | — | (22) |
| Defined benefit plans | 142 | 2 |
| Defined contribution plans | 100 | — |
| **Total net periodic cost** | $242 | $ 2 |
| **Other Changes in Plan Assets and Benefit Obligations Recognized in Other Comprehensive Income** | | |
| Net actuarial loss | $125 | $ (4) |
| Prior service credit | (16) | (32) |
| Amortization of net actuarial loss | (185) | (1) |
| Amortization of net prior service credit | (2) | 18 |
| Curtailment gain | — | 22 |
| **Total recognized in other comprehensive income** | $ (78) | $ 3 |

*a.* Describe what is meant by *service cost* and *interest cost* (the service and interest costs appear both in the reconciliation of the PBO and in the computation of pension expense).

*b.* What is the actual return on the pension and the health care ("Other") plan investments in 2015? Was Xerox's profitability impacted by this amount?

# Module 12

# Financial Statement Forecasting

## Learning Objectives

**LO1** Explain the process of forecasting financial statements. (p. 12-3)

**LO2** Forecast revenues and the income statement. (p. 12-6)

**LO3** Forecast the balance sheet. (p. 12-9)

**LO4** Adjust the forecasted cash balance. (p. 12-12)

**LO5** Prepare multiyear forecasts of financial statements. (p. 12-13)

**LO6** Refine forecasts with additional information. (p. 12-15)

**LO7** Forecast the statement of cash flows (Appendix 12A). (p. 12-20)

**LO8** Apply a parsimonious method for forecasting net operating profit and net operating assets (Appendix 12B). (p. 12-22)

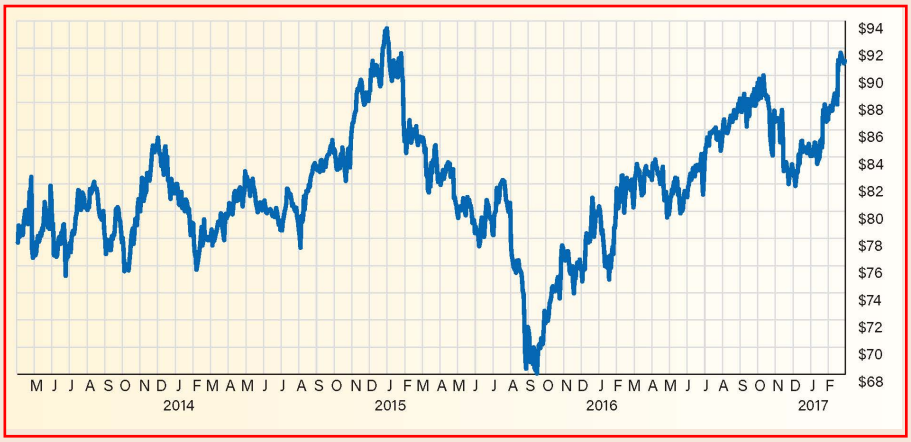
**PG**
**Market cap: $225,670 mil**
**Total assets: $127,136 mil**
**Revenues: $65,299 mil**
**Net income: $10,604 mil**

**Procter & Gamble (P&G)** sells a wide variety of personal care and household products in over 180 countries. In 2015, P&G reported a decline in sales and profit, not because of lower unit sales, but because of the strengthening U.S. dollar ($US) vis-à-vis other world currencies in which P&G transacts business. Its operating cash flow, however, increased to $14.6 billion despite the reported decline in sales.

Prior modules focus on historical financial statements—how to read and interpret financial statements and disclosures, how to analyze financial information to assess performance and financial position, and how to draw reasoned inferences about companies' financial condition and performance.

For many business decisions, historical financial statements are relevant to the extent that they help us forecast future financial performance. In this module, we explain the forecasting process, including how to forecast the income statement, the balance sheet, and the statement of cash flows.

Analysts and investors routinely forecast P&G's financial statements. Their forecasts provide critical input to financial models of the value of P&G's debt and equity securities (see our models in the debt and equity valuation modules). P&G's stock has languished since 2015 (see graph below), perhaps because investors and analysts forecast weak future growth or any number of other factors. [Source: *Procter & Gamble*, 2016 10-K]



1. **Unit-level activity**: performed for each unit sold.
2. **Order-level activity**: performed for each sales order.
3. **Customer-level activity**: performed to obtain or maintain each customer.
4. **Facility-level activity**: performed to maintain the general manufacturing function.

This classification scheme assists in answering questions concerning the cost of individual orders or individual customers.

If an organization sells to distinct market segments (for profit, not for profit, and government), the cost hierarchy can be modified as follows:

1. Unit-level activity
2. Order-level activity
3. Customer-level activity
4. **Market-segment-level activity**: performed to obtain or maintain operations in a segment.
5. Facility-level activity

The market-segment-level activities and their related costs differ with each market segment. This classification scheme assists in answering questions concerning the profitability of each segment.

Finally, an organization that completes unique projects for different market segments (such as buildings for **IBM** and the **U.S. Department of Defense**) can use the following hierarchy to determine the profitability of each segment:

1. **Project-level activity**: performed to support the completion of each project.
2. Market-segment-level activity
3. Facility-level activity

The possibilities are endless. The important point is that both the cost hierarchy and the costs included in the hierarchy be tailored to meet the specific circumstances of an organization and the interests of management.

## Review 15-5 LO5


**Customer Cost Hierarchy** Consider the pizza chain **Blaze Pizza**. They custom build and cook each pizza to order. Items 1-6 represent cost activities a particular store might incur.

1. Pepperoni on the pizza
2. Wood to fuel the fire used to cook the pizzas
3. Insurance on the building
4. The labor hours worked by the employee building and cooking each pizza
5. The sales calls made to local organizations to promote the pizzas for catering special events
6. The number of pizza orders received

**Required**

Classify each cost activity above, in the most appropriate level of the proposed customer cost hierarchy. Each cost activity may be used more than once.

_____ *a.* Unit-level—performed for each unit sold
_____ *b.* Order-level—performed for each sales level
_____ *c.* Customer-level—performed to obtain or maintain each customer
_____ *d.* Store(facility)-level—performed to maintain the general store functions

**Solution on p. 15-34.**

## Review 15-3—Solution

*a*. The cost of food sold was classified as a variable cost. Hence, the cost of food may be determined by dividing the total cost of food sold at either observation by the corresponding number of sandwiches.

$$\mathbf{b} = \frac{\mathbf{\$1{,}575 \text{ total variable costs}}}{\mathbf{2{,}100 \text{ units}}}$$
$$= \mathbf{\$0.75X}$$

Wages and salaries were previously classified as a mixed cost. Hence, the cost of wages and salaries is determined using the high-low method.

$$\textbf{(variable cost)} \qquad \mathbf{b} = \frac{\mathbf{\$1{,}675 - \$1{,}525}}{\mathbf{2{,}700 - 2{,}100}}$$
$$= \mathbf{0.25X}$$
$$\textbf{(fixed cost)} \qquad \mathbf{a = \$1{,}525 \text{ total cost} - (\$0.25 \times 2{,}100) \text{ variable cost}}$$
$$= \mathbf{\$1{,}000}$$

Rent on building was classified as a fixed cost.

$$\mathbf{a = \$1{,}500}$$

Total monthly costs most likely follow a mixed cost behavior pattern. Hence, they can be determined using the high-low method.

$$\mathbf{b} = \frac{\mathbf{\$6{,}556 - \$5{,}848}}{\mathbf{2{,}700 - 2{,}100}}$$
$$= \mathbf{\$1.18X}$$
$$\mathbf{a = \$5{,}848 - (\$1.18 \times 2{,}100)}$$
$$= \mathbf{\$3{,}370}$$
$$\textbf{Total costs} = \mathbf{\$3{,}370 + \$1.18X}$$

where

$$\mathbf{X = \text{unit sales}}$$

*b*. and *c*.

| Volume | Total Costs | Average Cost per Sandwich |
|---|---|---|
| 1,000. . . . . | $3,370 + ($1.18 × 1,000) = $4,550 | $\frac{\$4{,}550}{\$1{,}000} = \$4.550$ |
| 2,000. . . . . | $3,370 + ($1.18 × 2,000) = $5,730 | $\frac{\$5{,}730}{\$2{,}000} = \$2.865$ |

The average costs differ at 1,000 and 2,000 units because the fixed costs are being spread over a different number of units. The larger the number of units, the smaller the average fixed cost per unit.

## Review 15-4—Solution

Some common activity drivers for stating volume of activity in a manufacturing operation might include direct labor hours, machine hours, units of material produced, and units of finished product. The selection of the most appropriate basis requires judgment and professional experience. The relationship between the activity cost driver and the cost must seem logical and the activity data must be available.

## Review 15-5—Solution

1. *a*; Unit-level
2. *b*; Store-level
3. *c*; Store-level
4. *d*; Unit-level
5. *e*; Customer-level
6. *f*; Order-level

LO3 **E16-20. Not-for-Profit Applications**

Determine the solution to each of the following independent cases:

*a.* Collings College has annual fixed operating costs of $12,500,000 and variable operating costs of $1,000 per student. Tuition is $8,000 per student for the coming academic year, with a projected enrollment of 1,500 students. Expected revenues from endowments and federal and state grants total $250,000. Determine the amount the college must obtain from other sources.

*b.* The Collings College Student Association is planning a fall concert. Expected costs (renting a hall, hiring a band, etc.) are $30,000. Assuming 3,000 people attend the concert, determine the break-even price per ticket. How much will the association lose if this price is charged and only 2,700 tickets are sold?

*c.* City Hospital has a contract with the city to provide indigent health care on an outpatient basis for $25 per visit. The patient will pay $5 of this amount, with the city paying the balance ($20). Determine the amount the city will pay if the hospital has 10,000 patient visits.

*d.* A civic organization is engaged in a fund-raising program. On Civic Sunday, it will sell newspapers at $1.25 each. The organization will pay $0.75 for each newspaper. Costs of the necessary permits, signs, and so forth are $500. Determine the amount the organization will raise if it sells 5,000 newspapers.

*e.* Christmas for the Needy is a civic organization that provides Christmas presents to disadvantaged children. The annual costs of this activity are $5,000, plus $10 per present. Determine the number of presents the organization can provide with $20,000.

LO3, 5 **E16-21. Alternative Production Procedures and Operating Leverage**

Newell Brands (NWL)

Assume Sharpie, a brand of Newell Brands, is planning to introduce a new executive pen that can be manufactured using either a capital-intensive method or a labor-intensive method. The predicted manufacturing costs for each method are as follows:

| | Capital Intensive | Labor Intensive |
|---|---|---|
| Direct materials per unit | $ 5.00 | $ 6.00 |
| Direct labor per unit | $ 5.00 | $10.00 |
| Variable manufacturing overhead per unit | $ 4.00 | $ 2.00 |
| Fixed manufacturing overhead per year | $2,440,000 | $700,000 |

Sharpie's market research department has recommended an introductory unit sales price of $40. The incremental selling costs are predicted to be $500,000 per year, plus $2 per unit sold.

**Required**

*a.* Determine the annual break-even point in units if Sharpie uses the:
1. Capital-intensive manufacturing method.
2. Labor-intensive manufacturing method.

*b.* Determine the annual unit volume at which Sharpie is indifferent between the two manufacturing methods.

*c.* Management wants to know more about the effect of each alternative on operating leverage.
1. Explain operating leverage and the relationship between operating leverage and the volatility of earnings.
2. Compute operating leverage for each alternative at a volume of 250,000 units.
3. Which alternative has the higher operating leverage? Why?

LO3, 5 **E16-22. Contribution Income Statement and Operating Leverage**

Stateline Berry Farm harvests early-season blueberries for shipment throughout Michigan and Illinois in July. The blueberry farm is maintained by a permanent staff of 10 employees and seasonal workers who pick and pack the blueberries. The blueberries are sold in crates containing 100 individually packaged one-quart containers. Affixed to each one-quart container is the distinctive Stateline Berry Farm logo inviting buyers to "Enjoy the berry best blueberries in the world!" The selling price is $90 per crate, variable costs are $80 per crate, and fixed costs are $280,000 per year. In the year 2017, Stateline Berry Farm sold 50,000 crates.

**Required**

*a.* Prepare a contribution income statement for the year ended December 31, 2017.

*b.* Determine the company's 2017 operating leverage.

*c.* Calculate the percentage change in profits if sales decrease by 10 percent.

*d.* Management is considering the purchase of several berry-picking machines. This will increase annual fixed costs to $375,000 and reduce variable costs to $77.50 per crate. Calculate the effect of this acquisition on operating leverage and explain any change.

| | Actual | Budget |
|---|---|---|
| Unit sales | 300 | 250 |
| Unit selling price | $52 | $50 |
| Unit standard variable costs | (40) | (40) |
| Unit contribution margin | $12 | $10 |
| Revenues | $7,800 | $6,250 |
| Standard variable costs | (6,000) | (5,000) |
| Contribution margin at standard costs | $1,800 | $1,250 |

**Required**

Compute the revenue, sales price, and the sales volume variances.

**M23-23. Fixed Overhead Variances** LO7

Assume that ExxonMobil uses a standard cost system for each of its refineries. For the Houston refinery, the monthly fixed overhead budget is $8,000,000 for a planned output of 5,000,000 barrels. For September, the actual fixed cost was $8,750,000 for 5,100,000 barrels.

ExxonMobil (XOM)


**Required**

*a.* Determine the fixed overhead budget variance.

*b.* If fixed overhead is applied on a per-barrel basis, determine the volume variance.

**M23-24. Reconciling Budgeted and Actual Income** LO8

Black Supply Company has three responsibility centers: sales, production, and administration. The following information pertains to the November activities of Black Supply:

| | |
|---|---|
| Budgeted contribution income | $36,000 |
| Actual contribution income | 54,000 |
| Sales price variance | 48,000 F |
| Sales volume variance | 80,000 F |
| Net sales price variance | 12,000 F |
| Sales department variable expense variance | 36,000 U |
| Sales department fixed expense variance | 3,000 U |
| Administration department variances | 1,000 F |
| Production department variances | 4,000 U |

**Required**

Prepare a reconciliation of budgeted and actual contribution income.

## Exercises

**E23-25. Elements of a Flexible Budget** LO2

Presented are partial flexible cost budgets for various levels of output.


| | Rate per unit | Units | | |
|---|---|---|---|---|
| | | 2,500 | 3,750 | 5,000 |
| Direct materials | a. | $25,000 | b. | c. |
| Direct labor | d. | e. | 7,500 | f. |
| Variable overhead | $3 | g. | h. | i. |
| Fixed overhead | | j. | k. | l. |
| Total | | m. | n. | $100,000 |

**Required**

Solve for items "a" though "n."

**E25-21. NPV and IRR: Unequal Annual Net Cash Inflows** LO2, 8

Rocky Road Company is evaluating a capital expenditure proposal that has the following predicted cash flows:

| | |
|---|---|
| Initial investment | $(90,220) |
| Operation | |
| Year 1 | 41,275 |
| Year 2 | 60,000 |
| Year 3 | 20,000 |
| Salvage | 0 |

**Required**

*a.* Using a discount rate of 14 percent, determine the net present value of the investment proposal.

*b.* Determine the proposal's internal rate of return. (Refer to Appendix 25B if you use the table approach.)

**E25-22. Payback Period, IRR, and Minimum Cash Flows** LO2, 3, 8

The management of Mohawk Limited is currently evaluating the following investment proposal:

| | Time 0 | Year 1 | Year 2 | Year 3 | Year 4 |
|---|---|---|---|---|---|
| Initial investment | $150,000 | — | — | — | — |
| Net operating cash inflows | — | $50,000 | $50,000 | $50,000 | $50,000 |

**Required**

*a.* Determine the proposal's payback period.

*b.* Determine the proposal's internal rate of return. (Refer to Appendix 25B if you use the table approach.)

*c.* Given the amount of the initial investment, determine the minimum annual net cash inflows required to obtain an internal rate of return of 16 percent. Round the answer to the nearest dollar.

**E25-23. Time-Adjusted Cost-Volume-Profit Analysis** LO2, 3

Honeydukes Treat Shop is considering the desirability of producing a new chocolate candy called Pleasure Bombs. Before purchasing the new equipment required to manufacture Pleasure Bombs, Neville Long, the shop's proprietor performed the following analysis:

| | |
|---|---|
| Unit selling price | $2.18 |
| Variable manufacturing and selling costs | (1.73) |
| Unit contribution margin | $0.45 |
| Annual fixed costs | |
| Depreciation (straight-line for 4 years) | $22,500 |
| Other (all cash) | 45,000 |
| Total | $67,500 |

Annual break-even sales volume = $67,500 ÷ $0.45 = 150,000 units

Because the expected annual sales volume is 160,000 units, Long decided to undertake the production of Pleasure Bombs. This required an immediate investment of $87,000 in equipment that has a life of four years and no salvage value. After four years, the production of Pleasure Bombs will be discontinued.

**Required**

*a.* Evaluate the analysis performed by Long.

*b.* If Honeydukes Treat Shop has a time value of money of 8 percent, should it make the investment with projected annual sales of 160,000 units?

*c.* Considering the time value of money, what annual unit sales volume is required to break even?