Solutions for CFIN 6th Edition by Besley

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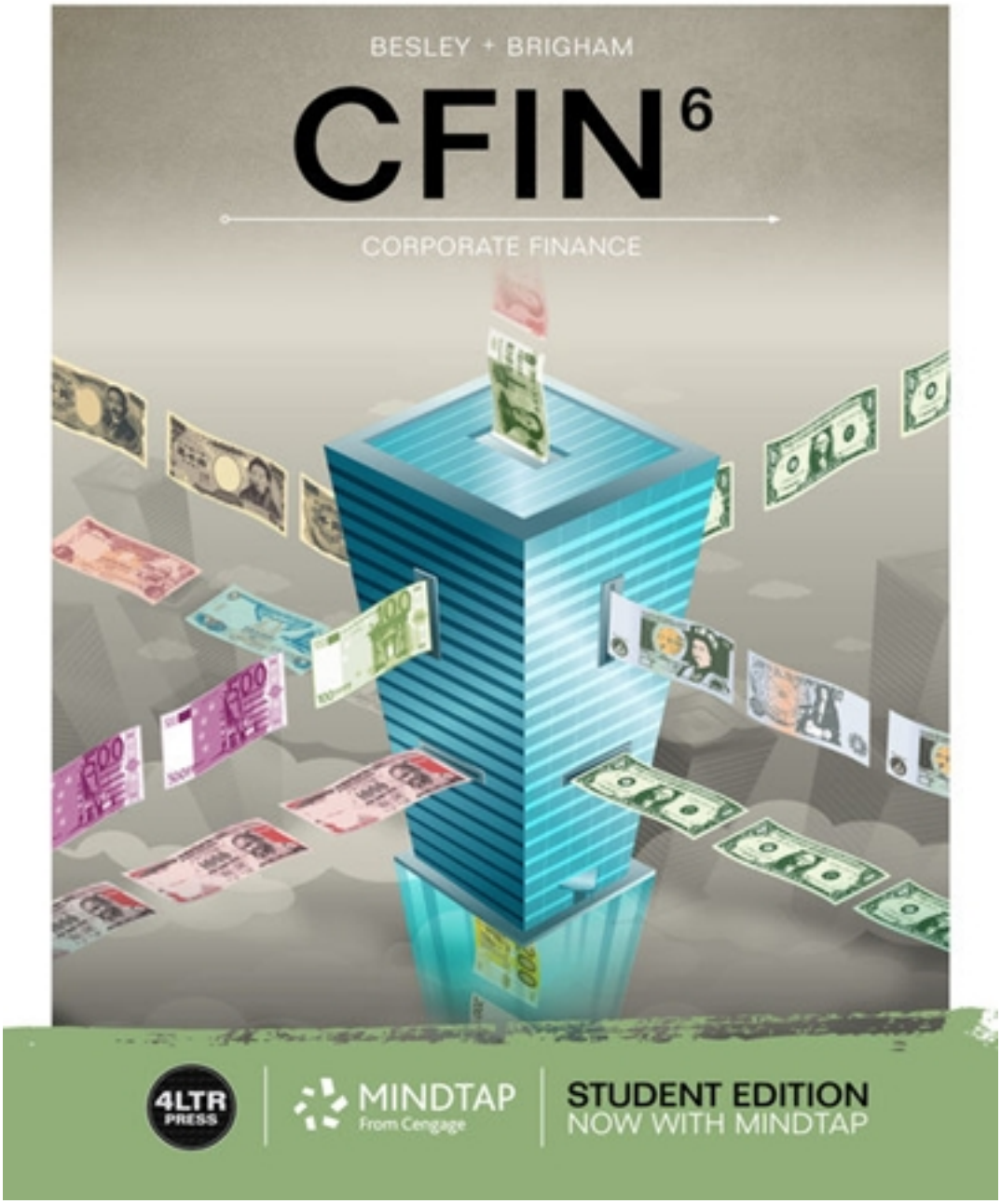


# Solutions

# Chapter 2 Solutions

2-1 Publically-traded companies are required to provide adequate financial information to their shareholders. Information generally is provided through financial reports that a company periodically produces, which include a balance sheet, an income statement, a statement of cash flows, and a statement of retained earnings. In addition, the reports published by a company contain discussions of the firm's operations, both present and forecasted. Each of the financial statements provides different types of information. But, because it incorporates information from both the income statement and the balance sheet, the statement of cash flow provides the best information for investors.

2-2 (a) The balance sheet shows, at a particular point in time, the amount the firm has invested in assets and how much of those investments are financed with loans (liabilities) and how much are financed with equity (stock). (b) The income statement shows the revenues (sales) that the firm generated during a particular period and the expenses that were incurred during that same period, whether those expense were incurred as the result of normal operations or as the result of how the firm is financed. (c) The statement of cash flows shows how the firm generated cash (inflows) and how the firm used cash (outflows) during a particular accounting period. If the firm uses more cash than it generates through normal operations, it is deficit spending, and deficit spending must be financed with external funds (either stocks or debt).

2-3 The most important aspect of ratio analysis is the judgment used when interpreting the results to reach conclusions concerning a firm's current financial position and the direction in which the firm is headed in the future. The analyst should be aware of, and include in the interpretation, the fact that: (1) large firms with many different divisions are difficult to categorize into a single industry; (2) financial statements are reported at historical costs; (3) seasonal factors can distort the ratios; (4) some firms try to "window dress" their financial statements to look good; (5) firms use different accounting procedures to compute inventory values, depreciation, and so on; (6) there might not exist a single value that can be used for comparing firms' ratios (e.g., a current ratio of 2.0 might not be good for some firms); and (7) conclusions concerning the overall financial position of a firm should be based on a representative number of ratios, not a single ratio.

2-4 Shares issued = 100,000 Price per share = $7 Par value per share = $3

Common stock at par = $300,000 = $3 x 100,000

Paid-in capital = $400,000 = ($7 - $3) x 100,000 = $700,000 - $300,000

2-5 Net cash flow = Net income + Depreciation = $90,000 + $25,000 = $115,000

2-6 The income statement for HighTech Wireless with the information that is given in the problem:

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

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

1. NI = EBT(1 – 0.4)

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

   Taxes = $400,000 - $240,000 = $160,000

2. EBIT = EBT + Interest = $400,000 + 0 = $400,000

3. Sales = EBIT + Operating expenses, excluding depreciation + Depreciation

   = $400,000 + $500,000 + $100,000 = $1,000,000

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

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

Net cash flow = Net income + Depreciation = $240,000 + $100,000 = $340,000

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

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

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

Inventory = $73,500 – 3.0($21,000) = $10,500

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

Sales = 2.0($150,000) = $300,000

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

Net income = 0.06($150,000) = $9,000

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

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

Net income = 0.05($300,000) = $15,000

b. $\text{Return on equity} = \frac{\text{Net income}}{\text{Common equity}} = \frac{\$15{,}000}{\$300{,}000 - \$200{,}000} = \frac{\$15{,}000}{\$100{,}000} = 0.15 = 15.0\%$

Alternative solution:

$$\text{Return on equity} = \frac{\text{Net income}}{\text{Common equity}} = \text{ROA} \times \frac{\text{Total assets}}{\text{Common equity}}$$

$$= 0.05 \times \frac{\$300{,}000}{\$300{,}000 - \$200{,}000} = 0.05 \times 3.0 = 0.15 = 15.0\%$$

2-10 a. Debt ratio = 40%

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

Common equity = $750,000(0.6) = $450,000

b. $\text{ROA} = \frac{\text{Net income}}{\text{Total assets}} = \frac{\text{Sales}}{\text{Total assets}} \times \frac{\text{Net income}}{\text{Sales}}$

$$0.06 = 3.0 \times \frac{\text{Net income}}{\text{Sales}}$$

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

Alternative solution:

$$\text{Total assets turnover} = \frac{\text{Sales}}{\text{Total assets}} = \frac{\text{Sales}}{\$750{,}000} = 3.0$$

Sales = 3($750,000) = $2,250,000

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

Net income = 0.06($750,000) = $45,000

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

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

Sales = 2.5($10,000) = $25,000

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

Net income = 0.04($10,000) = $400

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

Alternative solution:

$$\text{Return on assets} = \frac{\text{Sales}}{\text{Total assets}} \times \frac{\text{Net income}}{\text{Sales}}$$

$$= 2.5 \times \frac{\text{Net income}}{\text{Sales}} = 0.04$$

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

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

Current liabilities = $340,000/5.0 = $68,000

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

Inventories = $340,000 – 1.8($68,000) = $340,000 - $122,400 = $217,600

(3) Current assets = (Cash & Equivalents) + Accounts receivable + Inventories

$340,000 = $43,000 + Accounts receivable + $217,600

Accounts receivable = $340,000 - $43,000 - $217,600 = $79,400

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

CGS = 7($217,600) = $1,523,200

(5) CGS = 0.80 (Sales), thus: $\text{Sales} = \dfrac{\$1{,}523{,}300}{0.80} = \$1{,}904{,}000$

(6) $\text{DSO} = \dfrac{\text{Accounts receivable}}{\text{Sales} / 360} = \dfrac{\$79{,}400}{(\$1{,}904{,}000 / 360)} =$ 15.0 days

2-13 a. TIE = EBIT/INT, so find EBIT and INT

Interest = $200,000 x 0.06 = $12,000

Net income = $540,000 x 0.04 = $21,600

Net income = Taxable income(1 – T)

Taxable income (EBT) = $21,600/(1 - T) = $21,600/(1 – 0.4) = $36,000

EBIT = $36,000 + $12,000 = $48,000

TIE = $48,000/$12,000 = 4.0 x

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

When EBIT = $72,000, Net income = ($72,000 – $12,000)(1 – 0.40) = $36,000

Because NI = 0.04(Sales), Sales = $36,000/0.04 = $900,000

Check: When Sales = $900,000, NI = $900,000 x 0.04 = $36,000

EBT = $36,000/(1 – 0.40) = $60,000

EBIT = $60,000 + $12,000 = $72,000

TIE = $72,000/$12,000 = 6.0

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

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

a. EPS = $14,000,000/7,000,000 = $2

P/E ratio = $8/$2 = 4.0

b. Book value per share = $35,000,000/7,000,000 = $5

M/B ratio = $8/$5 = 1.6

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

Debt Ratio = 60%

a. From DuPont equation: ROE = ROA x Equity multiplier

0.15 = ROA x (Total assets/Common equity)

Recognize that Total assets/Common equity is simply the inverse of the proportion of the firm that is financed with equity. The proportion of the firm that is financed with equity equals 1 – Debt ratio. Thus,

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

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

ROA = 0.15/2.5 = 0.06 = 6.0%

b. ROA = (Net profit margin) x (Total assets turnover)

0.06 = Net profit margin x 2.0

Net profit margin = 0.06/2.0 = 0.03 = 3.0%

Alternative solution:

TA turnover = Sales/Total assets = 2.0x, thus Sales = 2.0(Total assets)

ROE = (Net income)/(Common equity) = (Net income)/[(1 – 0.6)(Total assets) = 0.15, thus,

Net income = 0.15(0.4)(Total assets) = 0.06(Total assets)

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

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

Debt Ratio = 20%

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

Net income = 0.08($440,000) = $35,200

b. From DuPont equation: ROE = ROA x Equity multiplier

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

Thus, ROE = 0.08 x 1.25 = 0.10 = 10.0%

Alternative solution:

Common equity = $440,000(1 – 0.2) = $352,000

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

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

Net income = $140,000 Long-term debt = $1,755,000

% assets financed with equity = 35%

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

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

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

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

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

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

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

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

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

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

Sales = \$1,800,000

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

Current liabilities = \$150,000/5 = \$30,000

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

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

(3) Total liabilities = \$450,000(1 – 0.60) = \$180,000

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

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

Fixed assets turnover = 8.0 Current ratio = 5.0

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

Shares of common = 60,000

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

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

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

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

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

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

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

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

## Chapter 2

### Ethical Dilemma

### Hocus-Pocus—Look, An Increase in Sales!

Dynamic Energy Wares (DEW) manufactures and distributes products that are used to save energy and to help reduce and reverse the harmful environmental effects of atmospheric pollutants. DEW relies on a relatively complex distribution system to get the products to its customers. Large companies, which account for nearly 30% of the firm's total sales, purchase directly from DEW. Smaller companies and retailers that sell to individuals are required to make their purchases from one of the 50 independent distributors that are contractually obligated to exclusively sell DEW's products.

DEW'S accountants have just finished the firm's financial statements for the third quarter of the fiscal year, which ended 3 weeks ago. The results are terrible. Profits are down 30% from this time last year, when a downturn in sales began. Profits are depressed primarily because DEW continues to lose market share to a competitor that entered the field nearly 2 years ago.

Senior management has decided it needs to take action to boost sales in the fourth quarter so that year-end profits will be "more acceptable." Starting immediately, DEW will (1) eliminate all direct sales, which means that large companies must purchase products from DEW's distributors, just as the smaller companies and retailers do; (2) require distributors to maintain certain minimum inventory levels, which are much higher than previous levels; and (3) form a task force to study and propose ways that the firm can recapture its lost market share.

The financial manager, who is your boss, has asked you to attend a hastily called meeting of DEW's distributors to announce the implementation of these operational changes. At the meeting, the distributors will be informed that they must increase inventory to the required minimum level before the end of DEW's current fiscal year or face losing the distributorship. According to your boss, the reason for this requirement is to ensure that distributors can meet the increased demand they will face when the large companies are no longer permitted to purchase directly from DEW. The sales forecast you have been developing over the past few months, however, indicates that distributors' sales are expected to decline by almost 10% during the next year. As a consequence, the added inventories might be extremely burdensome to the distributors. When you approached your boss to discuss this potential problem, she said, "Tell the distributors not to worry! We won't require payment for six months, and any additional inventory that remains unsold after nine months can be returned. But they must take delivery of the inventory within the next two months."

It appears that the actions implemented by DEW will produce favorable year-end sales results for the current fiscal year. Do you agree with the decisions made by DEW's senior

management? Will you be comfortable announcing the changes to DEW's distributors? How would you respond to a distributor who says, "DEW doesn't care about us. The company just wants to look good no matter who gets hurt—that's unethical"? What will you say to your boss? Will you attend the distributors' meeting?

## ETHICAL DILEMMA

## Hocus-Pocus—Look, An Increase in Sales!

**Ethical dilemma:**

Dynamic Energy Wares (DEW) has decided to change the manner in which it distributes its products to large companies. The change in the distribution system comes at a time when DEW's profits are declining. The declining profits might not be the sole reason for the change, but it appears to be the primary impetus for the decision. It also appears that the new policy requiring DEW's distributors to increase inventory levels before the end of the fiscal year will *artificially* inflate DEW's sales for the current year. However, DEW's new policy does not require the distributors to pay for any increased inventory until next year (six months), and any unsold inventory can be returned after nine months. So, if the demand for DEW's products actually is decreasing, the impact will appear on next year's financial statements. If the financial manager actually intends to artificially inflate DEW's profits this year, she must realize that such actions eventually will "catch up" with her.

**Discussion questions:**

- *What is the ethical dilemma?*

  Discussion about this question can be fueled by asking some additional questions: Is it unethical for DEW to change its distribution system if the reason is to artificially inflate profits? Would it be unethical if the decision was made for the purposes of eliminating inefficiencies in the distribution process?

- *Should DEW change its distribution system?*

  Most would agree that DEW should not change its distribution system if the intent is simply to artificially inflate earnings in the current period. In fact, empirical studies indicate that such actions are useless if the purpose is to make the company look good to investors, because investors as a whole generally recognize such tactics for what they really are—"smoke screens." On the other hand, if the purpose for the change is to increase inventory efficiency, then it probably is a wise decision. For example, the change should decrease the cost of holding (carrying) inventory because the levels of inventory held by DEW will decrease. If such actions do not adversely affect demand for its products, they should be carried out.

- *What should DEW do?*

  It appears that DEW needs some changes because profits have been declining during the past year. A quick, temporary "fix" is not an appropriate solution—it just delays the inevitable. DEW needs to come up with a solution that will stabilize or improve earnings in the long run. The fact that senior management has decided to form a task force to examine and recommend ways to improve its market share is a step in the right direction. Such action indicates that DEW wants to find a long-run solution to its declining profits.

  Discuss some additional steps (actions) DEW can take to improve its financial position and to remain competitive.

- *Would you go to the distributors' meeting? What should you tell the distributors?*

  If there is no penalty for declining to attend the distributors' meeting, most students would tell you they would prefer to stay home. But, ask them what they would do if their boss, the financial manager, said they had to attend the meeting or lose their well-paying job. Now, you will find that some of the students change their minds.

  Redirect the discussion by asking the students what strategy they would follow if they actually did attend the distributors' meeting. Would they try to mislead the distributors if they believed DEW's decision to change the

distribution system was made solely for the purpose of artificially increasing profits? What tact would be taken if they believed the decision ultimately would improve inventory efficiency for both DEW and the distributors? How would distributors concerns be handled? The answers to these questions will be varied. But, you probably will find the discussion has an underlying theme—while many believe it is part of the business world, most students will express discomfort with the prospect of having to overtly mislead others.

**References:**

There have been many reports of firms that have followed a strategy similar to that described in this chapter's ethical dilemma. A couple of classic examples occurred in 1994—one involved Bausch & Lomb, Inc., which is a well-known eyewear company; the other involved PerSeptive Biosystems, which produces instruments used in biotechnology analysis.

In the last quarter of 1993, Bausch & Lomb instituted a change in its distribution system that helped reduce inventories significantly and allowed the company to post a $10 million gain for the quarter. Midway through 1994, however, Bausch & Lomb estimated its distributors had excess inventory equal to $75 million. During the year, the company had to repurchase much of this excess inventory because it could not be sold by the distributors. Because of the poor performance of Bausch & Lomb in 1994, the CEO's performance bonus was cut to zero. Additional information concerning Bausch & Lomb's decision to change its distribution system can be found in the following articles:

"Bausch & Lomb: Clouded Vision," *Financial World*, May 23, 1995, p. 16+.

"Bad Math at Bausch & Lomb?," *Business Week*, December 19, 1994, p. 108+.

"Bausch & Lomb's Myopia," *Forbes*, December 5, 1994, p. 14+.

It was reported that PerSeptive would offer its diagnostic equipment, some of which cost in excess of $50,000, to prospective customers on a trial basis, requiring payment at some later date only if the equipment was found to be desirable. At the time, PerSeptive's management stated the strategy was to increase renewable sales by allowing the market to experience its product firsthand before requiring a purchase commitment. Even though the trial offers were not technically considered sales, in some instances, PerSeptive recorded them as sales and corresponding receivables. For the quarter ending September 30, 1994, PerSeptive posted nearly a $21 million loss because it wrote off a large amount of inventory and had to reduce accounts receivable significantly. Its "free trial" offer did not generate the renewable sales that it hoped. For more information about PerSeptive and this situation, the following articles might be helpful:

"PerSeptive Restates Its Results for Much of Past 2 Fiscal Years," *The Wall Street Journal*, December 28, 1994.

"Biotech Company Is Questioned About 'Try It Out' Sales Strategy," *The Wall Street Journal*, November 8, 1994, p. B1+.

"Enterprise: Tech Concerns Fudge Figures to Buoy Stocks," *The Wall Street Journal*, May 19, 1994, p. B1+.

As you know, there are quite a few examples of "misjudgments" in the applications of accounting practices that have been reported in recent times, including the famous Enron situation. Recent articles that relate these misjudgments include the following:

"Accounting Abracadabra: Cooking the Books Proves Common Trick of the Trade," *USA Today*, August 11, 1998, p. 1B.

"More Second-Guessing: Markets Need Better Disclosure of Earnings Management," *Barron's*, August 24, 1998, p. 47.

"SEC Probes Telxon’s Accounting Practices, Unusual Securities Trading," Dow Jones Business News, February 22, 1999.

"Rite Aid Restates Year Net Downward, Reversing Some Accounting Maneuvers," *The Wall Street Journal*, June 2, 1999, p. A3.

# Chapter 2 Spreadsheet Problem

## Financial Statement Analysis

The problem requires you to use File C02 on the computer problem spreadsheet.

Cary Corporation's forecasted financial statements for next year follow, along with industry average ratios.

**a.** Compare Cary's forecasted ratios with the industry average data, and comment briefly on Cary's projected strengths and weaknesses.

**Cary Corporation: Forecasted Balance Sheet as of December 31**

| | | | |
|---|---|---|---|
| Cash | $ 72,000 | Accounts and notes payable | $ 432,000 |
| Accounts receivable | 439,000 | Accruals | 170,000 |
| Inventories | 894,000 | Total current liabilities | $ 602,000 |
| Total current assets | $1,405,000 | Long-term debt | 404,290 |
| Land and building | 238,000 | Common stock | 575,000 |
| Machinery | 132,000 | Retained earnings | 254,710 |
| Other fixed assets | 61,000 | | |
| Total assets | $1,836,000 | Total liabilities and equity | $1,836,000 |

**Cary Corporation: Forecasted Income Statement**

| | |
|---|---|
| Sales | $4,290,000 |
| Cost of goods sold | (3,580,000) |
| Gross operating profit | $ 710,000 |
| General administrative and selling expenses | ( 236,320) |
| Depreciation | ( 159,000) |
| Miscellaneous | ( 134,000) |

| | |
|---|---|
| Earnings before taxes (EBT) | $ 180,680 |
| Taxes (40%) | ( 72,272) |
| Net income | $ 108,408 |
| Number of shares outstanding | 23,000 |
| ***Per-Share Data*** | |
| EPS | $ 4.71 |
| Cash dividends per share | $ 0.95 |
| P/E ratio | 5.0× |
| Market price (average) | $23.57 |

**Industry Financial Ratios**[a]

| | |
|---|---|
| Quick ratio | 1.0× |
| Current ratio | 2.7 |
| Inventory turnover[b] | 5.8× |
| Days sales outstanding | 32 days |
| Fixed assets turnover[b] | 13.0× |
| Total assets turnover[b] | 2.6× |
| Return on assets | 9.1% |
| Return on equity | 18.2% |
| Debt ratio | 50.0% |
| Profit margin on sales | 3.5% |
| P/E ratio | 6.0× |

[a]Industry average ratios have been constant for the past four years.

[b]Based on year-end balance sheet figures.

**b.** What do you think would happen to Cary's ratios if the company initiated cost-cutting measures that allowed it to hold lower levels of inventory and substantially decrease the cost of goods sold? To answer this question, suppose inventories drop to $700,000 and the inventory turnover is 5.0 (HINT: In this case, cost of goods sold will change.).

**c.** Suppose Cary Corporation is considering installing a new computer system that would provide tighter control of inventories, accounts receivable, and accounts payable. If the new system is installed, the following data are projected (rather than the data given earlier) for the indicated balance sheet and income statement accounts:

| | |
|---|---|
| Accounts receivable | $ 395,000 |
| Inventories | $ 700,000 |
| Other fixed assets | $ 150,000 |
| Accounts and notes payable | $ 275,000 |
| Accruals | $ 120,000 |
| Cost of goods sold | $3,450,000 |
| Administrative and selling expenses | $ 248,775 |
| P/E ratio | 6.0× |

How do these changes affect the projected ratios and the comparison with the industry averages? (Note that any changes to the income statement will change the amount of retained earnings; therefore, the model is set up to calculate next year's retained earnings as this year's retained earnings plus net income minus dividends paid. The model also adjusts the cash balance so that the balance sheet balances.)

**d.** If the new computer system were even more efficient than Cary's management had estimated and thus caused the cost of goods sold to decrease by $125,000 from the projections in part (c), what effect would it have on the company's financial position?

**e.** If the new computer system were less efficient than Cary's management had estimated and caused the cost of goods sold to increase by $125,000 from the projections in part (a), what effect would it have on the company's financial position?

**f.** Change, one by one, the other items in part (c) to see how each change affects the ratio analysis. Then think about and write a paragraph describing how computer models such as this one can be used to help make better decisions about the purchase of such items as a new computer system.

# Spreadsheet Problem Solution

## Chapter 2

a. Following are the data and the ratios for Cary:

| INPUT DATA: | | KEY OUTPUT: | | |
|---|---|---|---|---|
| | | | Cary | Industry |
| Cash | $ 72,000 | Quick | 0.85 | 1.00 |
| A/R | 439,000 | Current | 2.33 | 2.70 |
| Inventories | 894,000 | Inv. turn. | 4.00 | 5.80 |
| Land and bldg | 238,000 | DSO (days) | 36.84 | 32.00 |
| Machinery | 132,000 | FA turnover | 9.95 | 13.00 |
| Other F.A. | 61,000 | TA turnover | 2.34 | 2.60 |
| | | ROA | 5.90% | 9.10% |
| Accts & Notes Pay. | $ 432,000 | ROE | 13.07% | 18.20% |
| Accruals | 170,000 | TD/TA | 54.81% | 50.00% |
| Long-term debt | 404,290 | PM | 2.53% | 3.50% |
| Common stock | 575,000 | EPS | $4.71 | n.a. |
| Retained earnings | 254,710 | Stock Price | $23.57 | n.a. |
| | | P/E ratio | 5.00 | 6.00 |
| Total assets | $ 1,836,000 | M/B | 0.65 | n.a. |
| Total liabilities & equity | $ 1,836,000 | | | |
| | | | | |
| RE last year | 146,302 | | | |
| | | | | |
| Income statement | | | | |
| Sales | $ 4,290,000 | | | |
| Cost of G.S. | 3,580,000 | | | |
| Adm. & sales exp. | 236,320 | | | |
| Depreciation | 159,000 | | | |
| Misc. expenses | 134,000 | | | |
| Net income | $ 108,408 | | | |
| P/E ratio | 5.0 | | | |
| No. of shares | 23,000 | | | |
| Cash dividend | $ 0.95 | | | |

Here are Cary's base-case ratios and other data as compared to the industry:

| | Cary | Industry | Comment |
|---|---|---|---|
| Quick | 0.85x | 1.0x | Weak |
| Current | 2.33x | 2.7x | Weak |
| Inventory turnover | 4.0x | 5.8x | Poor |
| Days sales outstanding | 36.8 days | 32.0 days | Poor |
| Fixed assets turnover | 10.0x | 13.0x | Poor |
| Total assets turnover | 2.3x | 2.6x | Poor |
| Return on assets (ROA) | 5.9% | 9.1% | Bad |
| Return on equity (ROE) | 13.1% | 18.2% | Bad |
| Debt ratio | 54.8% | 50.0% | High |
| Profit margin on sales | 2.5% | 3.5% | Bad |
| EPS | $4.71 | n.a. | -- |
| Stock Price | $23.57 | n.a. | -- |
| P/E ratio | 5.0x | 6.0x | Poor |
| M/B ratio | 0.65 | n.a. | -- |

Cary appears to be poorly managed—all of its ratios are worse than the industry averages, and the result is low earnings, a low P/E, a low stock price, and a low M/B ratio. The company needs to do something to improve.

b. The revised data and ratios are shown below:

| INPUT DATA: | | KEY OUTPUT: | | |
|---|---|---|---|---|
| | | | Cary | Industry |
| Cash | $ 314,000 | Quick | 1.25 | 1.00 |
| A/R | 439,000 | Current | 2.41 | 2.70 |
| Inventories | 700,000 | Inv. turn. | 5.00 | 5.80 |
| Land and bldg | 238,000 | DSO (days) | 36.84 | 32.00 |
| Machinery | 132,000 | FA turnover | 9.95 | 13.00 |
| Other F.A. | 61,000 | TA turnover | 2.28 | 2.60 |
| | | ROA | 8.30% | 9.10% |
| Accts & Notes Pay. | $ 432,000 | ROE | 17.82% | 18.20% |
| Accruals | 170,000 | TD/TA | 53.41% | 50.00% |
| Long-term debt | 404,290 | PM | 3.65% | 3.50% |
| Common stock | 575,000 | EPS | $6.80 | n.a. |
| Retained earnings | 302,710 | Stock Price | $34.00 | n.a. |
| | | P/E ratio | 5.00 | 6.00 |

| | | | | |
|---|---|---|---|---|
| Total assets | $ 1,884,000 | M/B | 0.89 | n.a. |
| Total liabilities & equity | $ 1,884,000 | | | |
| | | | | |
| RE last year | 146,302 | | | |
| | | | | |
| Income statement | | | | |
| Sales | $ 4,290,000 | | | |
| Cost of G.S. | 3,500,000 | | | |
| Adm. & sales exp. | 236,320 | | | |
| Depreciation | 159,000 | | | |
| Misc. expenses | 134,000 | | | |
| Net income | $ 156,408 | | | |
| P/E ratio | 5.0 | | | |
| No. of shares | 23,000 | | | |
| Cash dividend | $ 0.95 | | | |

Cary's liquidity position has improved. In addition, ROA and ROE are better than in the previous scenario, and the profit margin now is higher than the industry average. Although the stock price has increased more than $10 per share, there is room for more improvements.

c. The revised data and ratios are shown below:

| INPUT DATA: | | KEY OUTPUT: | | |
|---|---|---|---|---|
| | | | Cary | Industry |
| Cash | $ 84,527 | Quick | 1.21 | 1.00 |
| A/R | 395,000 | Current | 2.99 | 2.70 |
| Inventories | 700,000 | Inv. turn. | 4.93 | 5.80 |
| Land and bldg | 238,000 | DSO (days) | 33.15 | 32.00 |
| Machinery | 132,000 | FA turnover | 8.25 | 13.00 |
| Other F.A. | 150,000 | TA turnover | 2.52 | 2.60 |
| | | ROA | 10.53% | 9.10% |
| Accts & Notes Pay. | $ 275,000 | ROE | 19.88% | 18.20% |
| Accruals | 120,000 | TD/TA | 47.03% | 50.00% |
| Long-term debt | 404,290 | PM | 4.17% | 3.50% |
| Common stock | 575,000 | EPS | $7.78 | n.a. |
| Retained earnings | 325,237 | Stock Price | $46.68 | n.a. |
| | | P/E ratio | 6.00 | 6.00 |
| Total assets | $ 1,699,527 | M/B | 1.19 | n.a. |
| Total liabilities & equity | $ 1,699,527 | | | |

| | |
|---|---|
| RE last year | 146,302 |

| Income statement | |
|---|---|
| Sales | $ 4,290,000 |
| Cost of G.S. | 3,450,000 |
| Adm. & sales exp. | 248,775 |
| Depreciation | 159,000 |
| Misc. expenses | 134,000 |
| Net income | $ 178,935 |
| P/E ratio | 6.0 |
| No. of shares | 23,000 |
| Cash dividend | $ 0.95 |

Under these new conditions, Cary Corporation looks much better. Its turnover ratios are still low, but its ROA and ROE are above the industry average, its estimated P/E ratio is better, and its stock price is anticipated to double. There still is room for improvement, but the company is in much better shape.

d. The financial statements and ratios for the scenario in which the cost of goods sold decreases by an additional $125,000 are shown next. As you can see, the profit ratios are quite high and the stock price has risen to $66.24.

| INPUT DATA: | | KEY OUTPUT: | | |
|---|---|---|---|---|
| | | | Cary | Industry |
| Cash | $ 159,527 | Quick | 1.40 | 1.00 |
| A/R | 395,000 | Current | 3.18 | 2.70 |
| Inventories | 700,000 | Inv. turn. | 4.75 | 5.80 |
| Land and bldg | 238,000 | DSO (days) | 33.15 | 32.00 |
| Machinery | 132,000 | FA turnover | 8.25 | 13.00 |
| Other F.A. | 150,000 | TA turnover | 2.42 | 2.60 |
| | | ROA | 14.31% | 9.10% |
| Accts & Notes Pay. | $ 275,000 | ROE | 26.04% | 18.20% |
| Accruals | 120,000 | TD/TA | 45.04% | 50.00% |
| Long-term debt | 404,290 | PM | 5.92% | 3.50% |
| Common stock | 575,000 | EPS | $11.04 | n.a. |
| Retained earnings | 400,237 | Stock Price | $66.24 | n.a. |
| | | P/E ratio | 6.00 | 6.00 |
| Total assets | $ 1,774,527 | M/B | 1.56 | n.a. |
| Total liabilities & equity | $ 1,774,527 | | | |

| | |
|---|---|
| RE last year | 146,302 |
| | |
| Income statement | |
| Sales | $ 4,290,000 |
| Cost of G.S. | 3,325,000 |
| Adm. & sales exp. | 248,775 |
| Depreciation | 159,000 |
| Misc. expenses | 134,000 |
| Net income | $ 253,935 |
| P/E ratio | 6.0 |
| No. of shares | 23,000 |
| Cash dividend | $ 0.95 |

e. The financial statements and ratios for the scenario in which the cost of goods sold increases by $125,000 over the revised estimate are shown next. As you can see, profits would decline sharply. The ROE would drop to 12.6 percent, EPS would fall to $4.52, the stock price would drop to $27.11, and the M/B ratio would be only 0.76.

| INPUT DATA: | | KEY OUTPUT: | | |
|---|---|---|---|---|
| | | | Cary | Industry |
| Cash | $ 9,527 | Quick | 1.02 | 1.00 |
| A/R | 395,000 | Current | 2.80 | 2.70 |
| Inventories | 700,000 | Inv. turn. | 5.11 | 5.80 |
| Land and bldg | 238,000 | DSO (days) | 33.15 | 32.00 |
| Machinery | 132,000 | FA turnover | 8.25 | 13.00 |
| Other F.A. | 150,000 | TA turnover | 2.64 | 2.60 |
| | | ROA | 6.40% | 9.10% |
| Accts & Notes Pay. | $ 275,000 | ROE | 12.59% | 18.20% |
| Accruals | 120,000 | TD/TA | 49.20% | 50.00% |
| Long-term debt | 404,290 | PM | 2.42% | 3.50% |
| Common stock | 575,000 | EPS | $4.52 | n.a. |
| Retained earnings | 250,237 | Stock Price | $27.11 | n.a. |
| | | P/E ratio | 6.00 | 6.00 |
| Total assets | $ 1,624,527 | M/B | 0.76 | n.a. |
| Total liabilities & equity | $ 1,624,527 | | | |

| | |
|---|---|
| RE last year | 146,302 |
| | |
| Income statement | |

| | |
|---|---|
| Sales | $ 4,290,000 |
| Cost of G.S. | 3,575,000 |
| Adm. & sales exp. | 248,775 |
| Depreciation | 159,000 |
| Misc. expenses | 134,000 |
| Net income | $ 103,935 |
| P/E ratio | 6.0 |
| No. of shares | 23,000 |
| Cash dividend | $ 0.95 |

f. Computer models allow us to analyze quickly the impact of operating and financial decisions on the firm's overall performance. A firm can analyze its financial ratios under different scenarios to see what might happen if a decision, such as the purchase of a new asset, did not produce the expected results. This gives the managers some idea about what might happen under the best and worst cases and helps them to make better decisions.

# CFIN6 - CHAPTER 2

## *Integrative Problem*

Donna Jamison was recently hired as a financial analyst by Computron Industries, a manufacturer of electronic components. Her first task was to conduct a financial analysis of the firm covering the last two years. To begin, she gathered the following financial statements and other data.

| **Balance Sheets** | **2019** | **2018** |
|---|---|---|
| ***Assets*** | | |
| Cash | $ 52,000 | $ 57,600 |
| Accounts receivable | 402,000 | 351,200 |
| Inventories | 836,000 | 715,200 |
| Total current assets | $1,290,000 | $1,124,000 |
| Gross fixed assets | 527,000 | 491,000 |
| Less accumulated depreciation | 166,200 | 146,200 |
| Net fixed assets | $ 360,800 | $ 344,800 |
| Total assets | $1,650,800 | $1,468,800 |
| ***Liabilities and Equity*** | | |
| Accounts payable | $ 175,200 | $ 145,600 |
| Notes payable | 225,000 | 200,000 |
| Accruals | 140,000 | 136,000 |
| Total current liabilities | $ 540,200 | $ 481,600 |
| Long-term debt | 424,612 | 323,432 |
| Common stock (100,000 shares) | 460,000 | 460,000 |
| Retained earnings | 225,988 | 203,768 |
| Total equity | $ 685,988 | $ 663,768 |
| Total liabilities and equity | $1,650,800 | $1,468,800 |

(*continued*)

| Income Statements | 2019 | 2018 |
|---|---|---|
| Sales | $3,850,000 | $3,432,000 |
| Cost of goods sold | (3,250,000) | (2,864,000) |
| Other expenses | ( 430,300) | ( 340,000) |
| Depreciation | ( 20,000) | ( 18,900) |
| Total operating costs | $3,700,300 | $3,222,900 |
| EBIT | $ 149,700 | $ 209,100 |
| Interest expense | ( 76,000) | ( 62,500) |
| EBT | $ 73,700 | $ 146,600 |
| Taxes (40%) | ( 29,480) | ( 58,640) |
| Net income | $ 44,220 | $ 87,960 |
| EPS | $0.442 | $0.880 |

| Statement of Cash Flows (2019) | | |
|---|---|---|
| ***Operating Activities*** | | |
| Net income | $ 44,220 | |
| *Other additions (sources o f cash)* | | |
| Depreciation | 20,000 | |
| Increase in accounts payable | 29,600 | |
| Increase in accruals | 4,000 | |
| *Subtractions (uses of cash)* | | |
| Increases in accounts receivable | ( 50,800) | |
| Increase in inventories | (120,800) | |
| Net cash flow from operations | | $( 73,780) |
| ***Long-Term Investing Activities*** | | |
| Investment in fixed assets | | $( 36,000) |
| ***Financing Activities*** | | |
| Increase in notes payable | $ 25,000 | |
| Increase in long-term debt | 101,180 | |
| Payment of cash dividends | ( 22,000) | |
| Net cash flow from financing | | $104,180 |
| Net reduction in cash account | | $( 5,600) |
| Cash at beginning of year | | 57,600 |
| Cash at end of year | | $ 52,000 |

(*continued*)

| Other Data | 2019 | 2018 |
|---|---|---|
| December 31 stock price | $6.00 | $8.50 |
| Number of shares | 100,000 | 100,000 |
| Dividends per share | $ 0.22 | $0.22 |
| Lease payments | $40,000 | $40,000 |

Industry average data for 2019:

| Ratio | Industry Average |
|---|---|
| Current | 2.7x |
| Quick | 1.0x |
| Inventory turnover | 6.0x |
| Days sales outstanding (DSO) | 32.0 days |
| Fixed assets turnover | 10.7x |
| Total assets turnover | 2.6x |
| Debt ratio | 50.0% |
| TIE | 2.5x |
| Fixed charge coverage | 2.1x |
| Net profit margin | 3.5% |
| ROA | 9.1 % |
| ROE | 18.2% |
| Price/earnings | 14.2x |
| Market/book | 1.4x |

Assume that you are Donna Jamison's assistant and that she has asked you to help her prepare a report that evaluates the company's financial condition. Answer the following questions:

**a.** What can you conclude about the company's financial condition from its statement of cash flows?

**b.** What is the purpose of financial ratio analysis, and what are the five major categories of ratios?

**c.** What are Computron's current and quick ratios? What do they tell you about the company's liquidity position?

**d.** What is Computron's inventory turnover, day's sales outstanding, fixed assets turnover and total assets turnover ratios? How does the firm's utilization of assets stack up against that of the industry?

**e.** What are the firm's debt, times-interest-earned, and fixed charge coverage ratios? How does Computron compare to the industry with respect to financial leverage? What conclusions can you draw from these ratios?

**f.** Calculate and discuss the firm's profitability ratios—that is, its net profit margin, return on assets (ROA),

and return on equity (ROE).

**g.** Calculate Computron's market value ratios—that is, its price/earnings ratio and its market/book ratio. What do these ratios tell you about investors' opinions of the company?

**h.** Use the DuPont equation to provide a summary and overview of Computron's financial condition. What are the firm's major strengths and weaknesses?

**i.** Use the following simplified 2019 balance sheet to show, in general terms, how an improvement in one of the ratios—say, the DSO—would affect the stock price. For example, if the company could improve its collection procedures and thereby lower the DSO from 38.1 days to 27.8 days, how would that change "ripple through" the financial statements (shown in thousands below) and influence the stock price?

| | | | |
|---|---|---|---|
| Accounts receivable | $ 402 | Debt | $ 965 |
| Other current assets | 888 | | |
| Net fixed assets | 361 | Equity | 686 |
| Total assets | $1,651 | Total liabilities and equity | $1,651 |

**j.** Although financial statement analysis can provide useful information about a company's operations and its financial condition, this type of analysis does have some potential problems and limitations, and it must be used with care and judgment. What are some problems and limitations?

# CFIN6 - CHAPTER 2

## INTEGRATIVE PROBLEM SOLUTIONS

a. Begin by reviewing briefly what balance sheets and income statements are. Then give an overview of the statement of cash flows. Explain that some data (net income, depreciation, and dividends) come from the income statement, while the other items reflect differences between balance sheet accounts and thus show changes in those accounts between the two dates.

The cash flow statement highlights some important aspects of Computron's financial condition. First, note that the firm's net operating cash flow is -$73,780, so its operations are draining cash despite the positive net income reported on the income statement. Second, because of its negative cash flow from operations, Computron had to borrow a total of $126,180 in long- and short-term debt to cover its operating cash outlays, to pay for fixed asset additions, and to pay dividends. Even after all this borrowing, Computron's cash account still fell by $5,600 during 2019.

b. Financial ratios are used to get an idea about the future financial condition of a firm by determining how well the company is being operated and where it needs improving. The ratio categories, and their purposes, are as follows:

1. Liquidity: Can the company make required payments in the short run (defined as the next year)?
2. Asset management: Are the investments in assets about right in view of sales levels?
3. Debt management (financing mix): Does the company have about the right amount of debt, or is it over leveraged?
4. Profitability: Are costs under good control as reflected in the profit margin, ROE, and ROE?
5. Market values: Do investors like what they see as reflected in the P/E and M/B ratios?

c. Computron has $540,200 in obligations that must be satisfied within the coming year. Will it have trouble meeting its required payments? A full liquidity analysis requires a cash budget, but these two ratios provide quick, easy-to-use measures of liquidity:

$$\text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}} = \frac{\$1{,}290{,}000}{\$540{,}200} = 2.39\times$$

$$\text{Quick ratio} = \frac{\text{Current assets} - \text{Inventories}}{\text{Current liabilities}} = \frac{\$1{,}290{,}000 - \$836{,}000}{\$540{,}200} = 0.84\times$$

| | 2019 | 2018 | Industry |
|---|---|---|---|
| Current ratio | 2.4x | 2.3x | 2.7x |
| Quick ratio | 0.8x | 0.8x | 1.0x |

Computron's current and quick ratios have both held steady from 2018 to 2019, but they are slightly below the industry average. With a 2019 current ratio of 2.4, Computron could liquidate assets at only 1/2.4 = 0.42 = 42% of book value and still pay off current creditors in full. In general, inventories are the least liquid of a firm's current assets, and they are the assets on which losses are most likely to occur in the event of a forced sale. Computron's quick ratio of 0.8 indicates that even if receivables can be collected in full, the firm would still need to raise some cash from the sale of inventories to meet its current claims.

d. $$\text{Inventory Turnover} = \frac{\text{Cost of goods sold}}{\text{Inventories}} = \frac{\$3,250,000}{\$836,000} = 3.9\times$$

| | 2019 | 2018 | Industry |
|---|---|---|---|
| Inventory turnover | 3.9x | 4.0x | 5.8x |

As a rough approximation, each item of Computron's inventories was sold and then restocked, or "turned over," 3.9 times during 2019. This compares poorly with the industry average of 6.0 times, and the downward trend from 2018 is also worrisome. This analysis raises the question of whether Computron is holding excess inventories (relative to its sales level), and also whether any of its inventories is old and obsolete, hence worth less than its stated value. A problem arises in calculating and analyzing inventory turnover. Sales occur throughout the year, but the inventory figure is for one point in time. If a firm's sales are highly seasonal, or are experiencing a strong trend, it would be preferable to use an average inventory amount. An average monthly figure would be best, but (beginning of year + end of year)/2 is better than a point value because it at least adjusts for sales trends. For Computron, 2019 average inventories = ($715,200 + $836,000)/2 = $775,600, so average inventory turnover for 2019 = $3,250,000/$775,600 = 4.2x.

$$\text{DSO} = \frac{\text{Accounts receivable}}{\left[\frac{\text{Sales}}{360}\right]} = \frac{\$402{,}000}{\left[\frac{\$3{,}850{,}000}{360}\right]} = 37.6 \text{ days}$$

| | 2019 | 2018 | Industry |
|---|---|---|---|
| DSO | 37.6 days | 36.8 days | 32.0 days |

The days sales outstanding (DSO) represents the average length of time that the firm must wait after making a sale before it receives cash. Computron's DSO is above the industry average and is trending higher, so it looks bad.

The DSO can also be compared with the firm's credit terms. To illustrate, if Computron's sales terms called for payment within 30 days, then a 37.6-day DSO would indicate that some customers are taking well in excess of the 30-day limit, because some presumably are paying on time, by the 30th day. Note that, as with inventories, an average figure for receivables would be better than the end-of-year amount.

$$\text{Fixed assets turnover} = \frac{\text{Sales}}{\text{Net fixed assets}} = \frac{\$3{,}850{,}000}{\$360{,}800} = 10.67\times$$

$$\text{Total assets turnover} = \frac{\text{Sales}}{\text{Total assets}} = \frac{\$3{,}850{,}000}{\$1{,}650{,}800} = 2.33\times$$

| | 2019 | 2018 | INDUSTRY |
|---|---|---|---|
| Fixed assets turnover | 10.7x | 10.0x | 10.7x |
| Total assets turnover | 2.3x | 2.3x | 2.6x |

Computron's fixed assets turnover ratio has improved from 2018 to 2019 to reach the industry average, but its total assets turnover ratio has remained relatively constant at a level just below the industry average. Thus, the company is utilizing its fixed assets at the industry average level, but its total assets turnover is below average. As indicated earlier, Computron might have excess inventories and receivables, and this would

lower the total assets turnover relative to the fixed assets turnover. (Note again that average values of fixed and total assets would provide a better indication of the assets actually used to generate sales for the year.)

e. $$\text{Debt ratio} = \frac{\text{Total debt}}{\text{Total assets}} = \frac{\$540,200 + \$424,600}{\$1,650,800} = 58.4\%$$

$$\text{TIE} = \frac{\text{EBIT}}{\text{Interest expense}} = \frac{\$149,700}{\$76,000} = 1.97\times$$

$$\text{Fixed charge coverage} = \text{FCC} = \frac{\text{EBIT} + \text{Lease payment}}{\text{Interest expense} + \text{Lease payments} + \frac{\text{Sinking fund payment}}{(1 - T)}}$$

$$= \frac{\$149,700 + \$40,00}{\$76,000 + \$40,000} = 1.6\times$$

| | 2019 | 2018 | Industry |
|---|---|---|---|
| Debt ratio | 58.4% | 54.8% | 50.0% |
| TIE | 2.0x | 3.3x | 2.5x |
| FCC | 1.6x | 2.4x | 2.1x |

All three measures reflect the extent of debt usage, but they focus on different aspects. Computron's debt ratio is above the industry average, and the trend is up. Creditors have supplied over one-half the firm's total financing. Computron probably would find it difficult to borrow additional funds at a reasonable cost without first raising more equity capital. Note that another leverage ratio, the debt-to-equity ratio, is also used in practice. Computron's debt-to-equity ratio for 2019 is 1.41, indicating that creditors have contributed $1.41 for each dollar of equity capital.

The tie ratio focuses on the firm's ability to cover its interest payments. In some situations, this is a better measure of debt usage than the debt ratio. For example, a firm might show a high debt ratio, but if its assets are old and largely depreciated, hence shown on the balance sheet at a low value even though the assets are really quite valuable and produce high income and cash flows, then the debt ratio might be overstating the impact of the debt on the firm's riskiness. In Computron's case, however, the 2019 tie is below the industry average and falling, and this, like the debt ratio, indicates high and possibly excessive use of debt.

The fixed charge coverage (FCC) ratio is similar to the tie ratio, but it is more inclusive in that it recognizes that long-term lease contracts also represent fixed, contractual payments. Computron's 2019 FCC ratio is also below the industry average, and it is falling. Again, this points out that Computron uses substantially more fixed charge financing than the average firm in the industry, so it probably would have trouble obtaining additional debt or lease financing. Note also that there are many variations of the coverage ratios, depending on the purpose of the analysis.

f. $$\text{Profit margin} = \frac{\text{Net income}}{\text{Sales}} = \frac{\$44,220}{\$3,850,000} = 1.15\%$$

| | 2019 | 2018 | Industry |
|---|---|---|---|
| Profit margin | 1.1% | 2.6% | 3.5% |

Computron's profit margin is low and falling. This indicates that its sales prices are relatively low, that its costs are relatively high, or both. Note that because we are primarily concerned with the profitability to common

stockholders, net income available to common stockholders after preferred dividends have been paid is used to calculate profit margin.

$$\text{ROA} = \frac{\text{Net income}}{\text{Total assets}} = \frac{\$44{,}220}{\$1{,}650{,}800} = 2.68\%$$

$$\text{ROE} = \frac{\text{Net income}}{\text{Common equity}} = \frac{\$44{,}220}{\$685{,}988} = 6.44\%$$

| | 2019 | 2018 | Industry |
|---|---|---|---|
| ROA | 2.7% | 6.0% | 9.1% |
| ROE | 6.4 | 13.3 | 18.2 |

Computron's ROA and ROE are substantially below the industry average, and falling. These are "bottom line" ratios, and because they are poor, one would anticipate that the company's common stock has not been doing very well.

g. $$\text{Price eanrings (P/E) ratio} = \frac{\text{Price per share}}{\text{Earnings per share}} = \frac{\$6.00}{\$0.442} = 13.57\times$$

$$\text{Market/book (M/B) ratio} = \frac{\text{Markert price per share}}{\text{Book value per share}} = \frac{\$6.00}{\$6.86} = 0.87\times$$

| | 2019 | 2018 | Industry |
|---|---|---|---|
| P/E | 13.6x | 9.7x | 14.2x |
| M/B | 0.9x | 1.3x | 1.4x |

The P/E ratio shows how much investors are willing to pay per dollar of reported profits. At the end of 2019, Computron's stock sold for $6.00 per share; its reported earnings were $44,220/100,000 = $0.44 per share; and the result was a P/E ratio of $6.00/$0.44 = 13.6x. Note that the firm's P/E ratio actually improved from 2018 to 2019, almost reaching the industry average. However, this was not caused by an increase in stock price—the price fell by almost 30%, from $8.50 to $6.00. Rather, the P/E ratio rose because of the 2019 earnings decline—earnings fell by almost 50% from the 2018 level. With earnings normalized (averaged over several years), Computron's P/E ratio would be well below the industry average, indicating that investors view Computron as being riskier and/or as having poorer growth prospects than the average firm in the industry.

The M/B ratio gives another indication of how investors regard the company. Good companies with consistently high rates of return on equity sell at higher multiples of book value than those with low returns. In 2019, Computron had a book value (of equity) per share of $685,988/100,000 = $6.86 and a stock price of $6.00, for an M/B ratio of $6.00/$6.86 = 0.9x. This is well below the 1.4x industry average, which is not surprising given Computron's poor ROE.

h. The DuPont equation provides an overview of (1) a firm's profitability as measured by ROA and ROE, (2) its expense control as measured by the profit margin, and (3) its assets utilization as measured by the total assets turnover, combining these items in the equation shows how the different factors interact to determine ROA and ROE. The data for Computron and the industry are given below.

| DuPont | Profit margin | Total assets turnover |
|---|---|---|

| Equation: | (profit/sales) | x | (Sales/TA) | = | ROA |
|---|---|---|---|---|---|
| 2019: | 1.15% | x | 2.33 | = | 2.7% |
| 2018: | 2.56 | x | 2.34 | = | 6.0 |
| Industry: | 3.50 | x | 2.6 | = | 9.1 |

We see that Computron's expense control as reflected in the profit margin is both poor and trending down, and that its total assets utilization is somewhat below average but holding steady. These measures combine to produce an ROA that is very low and falling.

i. Sales per day amount to $3,850,000/360 = $10,694. Accounts receivable are now $402,000, or 37.6 days' sales. If A/R can be reduced to 27.6 days without affecting sales, then the balance sheet item A/R would be $10,694 x 27.6 = $295,154, down $106,846 from the current level. That $106,846 could be used (1) to reduce debt, which would lower interest charges and thus increase profits, (2) to buy back stock, which would lower shares outstanding and thus raise EPS; or (3) to invest in productive assets, which presumably would raise net income. In any event, EPS, hence DPS, should increase.

The change also might improve the risk picture as reflected in the debt ratio (if the $106,846 were used to reduce debt), and it would almost certainly improve the coverage ratios. This would lower the firm's perceived riskiness. All of this would improve the stock price. (Note, however, that reducing accounts receivable by 10 days of sales is not a cost-free action.)

j. Some of the problems and limitations of financial statement analysis are discussed below.

(1) Many large firms operate a number of different divisions in quite different industries, and in such cases it is difficult to develop a meaningful set of industry averages for comparative purposes. This tends to make ratio analysis more useful for small, narrowly-focused firms than for large, multi-divisional ones.

(2) Most firms want to be better than average, so merely attaining average performance is not necessarily good. To achieve high-level performance, it is preferable to target on the industry leaders' ratios.

(3) Inflation distorts firms' balance sheets. Further, because inflation affects both depreciation charges and inventory costs, profits also are affected. Thus, a ratio analysis for one firm over time, or a comparative analysis of firms of different ages, must be interpreted with care and judgment.

(4) Seasonal factors can also distort ratio analysis. For example, the inventory turnover ratio for a food processor will be radically different if the balance sheet figure used for inventories is the one just before versus the one just after the canning season. This problem can be minimized by using monthly averages for inventories when calculating ratios such as turnover.

(5) Firms can employ "window dressing" techniques to make their financial statements look better to credit analysts. To illustrate, a Chicago builder borrowed on a two-year basis on December 29, 2018, held the proceeds of the loan as cash for a few days, and then paid off the loan ahead of time on January 6, 2019. This improved his current and quick ratios, and made his year-end 2018 balance sheet look good. However, the improvement was strictly temporary; a week later the balance sheet was back at the old level.

(6) Different operating and accounting practices can distort comparisons. As noted earlier, inventory valuation and depreciation methods can affect the financial statements and thus distort comparisons among firms that use different accounting procedures. Also, if one firm leases a substantial amount of its productive equipment, then it might show relatively few assets in comparison to its sales, because leased

assets often do not appear on the balance sheet. At the same time, the lease liability might not be shown as a debt. Thus, leasing can artificially improve both the debt and turnover ratios.

(7) It is difficult to generalize about whether a particular ratio is "good" or "bad." For example, a high current ratio might indicate a strong liquidity position, which is good, or excessive cash, which is bad, because excess cash in the bank is a non-earning asset. Similarly, a high fixed assets turnover ratio can occur either because a firm uses its assets efficiently or because it is undercapitalized and simply cannot afford to buy enough assets.

(8) A firm might have some ratios that look "good" and others that look "bad," making it difficult to tell whether the company is, on balance, in a strong or a weak position. However, statistical procedures can be used to analyze the net effects of a set of ratios. Many banks and other lending organizations use these procedures to analyze firms' financial ratios and, on the basis of their analyses, classify companies according to their probability of getting into financial distress.

*Conclusion*: In this chapter, we looked at financial statements from a historical perspective, to see how well the company has been run. Our real interest, though, is in the future. In the next chapter, we go on to forecast financial statements to get an idea of where the firm will be going in the future.