CHAPTER 3
WORKING WITH FINANCIAL STATEMENTS

Answers to Concepts Review and Critical Thinking Questions

1. *a.* If inventory is purchased with cash, then there is no change in the current ratio. If inventory is purchased on credit, then there is a decrease in the current ratio if it was initially greater than 1.0.

b. Reducing accounts payable with cash increases the current ratio if it was initially greater than 1.0.

c. Reducing short-term debt with cash increases the current ratio if it was initially greater than 1.0.

d. As long-term debt approaches maturity, the principal repayment and the remaining interest expense become current liabilities. Thus, if debt is paid off with cash, the current ratio increases if it was initially greater than 1.0. If the debt has not yet become a current liability, then paying it off will reduce the current ratio since current liabilities are not affected.

e. Reduction of accounts receivables and an increase in cash leaves the current ratio unchanged.

f. Inventory sold at cost reduces inventory and raises cash, so the current ratio is unchanged.

g. Inventory sold for a profit raises cash in excess of the inventory recorded at cost, so the current ratio increases.

2. The firm has increased inventory relative to other current assets; therefore, assuming current liability levels remain mostly unchanged, liquidity has potentially decreased.

3. A current ratio of 0.50 means that the firm has twice as much in current liabilities as it does in current assets; the firm potentially has poor liquidity. If pressed by its short-term creditors and suppliers for immediate payment, the firm might have a difficult time meeting its obligations. A current ratio of 1.50 means the firm has 50% more current assets than it does current liabilities. This probably represents an improvement in liquidity; short-term obligations can generally be met completely with a safety factor built in. A current ratio of 15.0, however, might be excessive. Any excess funds sitting in current assets generally earn little or no return. These excess funds might be put to better use by investing in productive long-term assets or distributing the funds to shareholders.

4. *a.* Quick ratio provides a measure of the short-term liquidity of the firm, after removing the effects of inventory, generally the least liquid of the firm's current assets.

b. Cash ratio represents the ability of the firm to completely pay off its current liabilities balance with its most liquid asset (cash).

c. The capital intensity ratio tells us the dollar amount investment in assets needed to generate one dollar in sales.

d. Total asset turnover measures how much in sales is generated by each dollar of firm assets.

e. Equity multiplier represents the degree of leverage for an equity investor of the firm; it measures the dollar worth of firm assets each equity dollar has a claim to.

f. Times interest earned ratio provides a relative measure of how well the firm's operating earnings can cover current interest obligations.

g. Profit margin is the accounting measure of bottom-line profit per dollar of sales.

h. Return on assets is a measure of bottom-line profit per dollar of total assets.

i. Return on equity is a measure of bottom-line profit per dollar of equity.

j. Price-earnings ratio reflects how much value per share the market places on a dollar of accounting earnings for a firm.

5. Common size financial statements express all balance sheet accounts as a percentage of total assets and all income statement accounts as a percentage of total sales. Using these percentage values rather than nominal dollar values facilitates comparisons between firms of different size or business type.

6. Peer group analysis involves comparing the financial ratios and operating performance of a particular firm to a set of peer group firms in the same industry or line of business. Comparing a firm to its peers allows the financial manager to evaluate whether some aspects of the firm's operations, finances, or investment activities are out of line with the norm, thereby providing some guidance on appropriate actions to take to adjust these ratios, if appropriate. An aspirant group would be a set of firms whose performance the company in question would like to emulate. The financial manager often uses the financial ratios of aspirant groups as the target ratios for his or her firm; some managers are evaluated by how well they match the performance of an identified aspirant group.

7. Return on equity is probably the most important accounting ratio that measures the bottom-line performance of the firm with respect to the equity shareholders. The Du Pont identity emphasizes the role of a firm's profitability, asset utilization efficiency, and financial leverage in achieving a ROE figure. For example, a firm with ROE of 20% would seem to be doing well, but this figure may be misleading if it were a marginally profitable (low profit margin) and highly levered (high equity multiplier). If the firm's margins were to erode slightly, the ROE would be heavily impacted.

8. The book-to-bill ratio is intended to measure whether demand is growing or falling. It is closely followed because it is a barometer for the entire high-tech industry where levels of revenues and earnings have been relatively volatile.

9. If a company is growing by opening new stores, then presumably total revenues would be rising. Comparing total sales at two different points in time might be misleading. Same-store sales control for this by only looking at revenues of stores open within a specific period.

10. *a.* For an electric utility such as Con Ed, expressing costs on a per kilowatt hour basis would be a way comparing costs with other utilities of different sizes.

b. For a retailer such as JC Penney, expressing sales on a per square foot basis would be useful in comparing revenue production against other retailers.

c. For an airline such as Delta, expressing costs on a per passenger mile basis allows for comparisons with other airlines by examining how much it costs to fly one passenger one mile.

d. For an on-line service such as Google or Yahoo!, using a per web hit basis for costs would allow for comparisons with similar services.

e. For a hospital such as Holy Cross, revenues and costs expressed on a per bed basis would be useful.

f. For a college textbook publisher such as McGraw-Hill/Irwin, the leading publisher of finance textbooks for the college market, the obvious standardization would be per book sold.

11. As with any ratio analysis, the ratios themselves do not necessarily indicate a problem, but simply indicate that something is different and it is up to us to determine if a problem exists. If the cost of goods sold as a percentage of sales is increasing, we would expect that EBIT as a percentage of sales would decrease, all else constant. An increase in the cost of goods sold as a percentage of sales occurs because the cost of raw materials or other inventory is increasing at a faster rate than the sales price.

This is may be a bad sign since the contribution of each sales dollar to net income and cash flow is lower. However, when a new product, for example, the HDTV, enters the market, the price of one unit will often be high relative to the cost of goods sold per unit, and demand, therefore sales, initially small. As the product market becomes more developed, price of the product generally drops, and sales increase as more competition enters the market. In this case, the increase in cost of goods sold as a percentage of sales is to be expected. The maker or seller expects to boost sales at a faster rate than its cost of goods sold increases. In this case, a good practice would be to examine the common-size income statements to see if this is an industry-wide occurrence.

12. If we assume that the cause is negative, the two reasons for the trend of increasing cost of goods sold as a percentage of sales are that costs are becoming too high or the sales price is not increasing fast enough. If the cause is an increase in the cost of goods sold, the manager should look at possible actions to control costs. If costs can be lowered by seeking lower cost suppliers of similar or higher quality, the cost of goods sold as a percentage of sales should decrease. Another alternative is to increase the sales price to cover the increase in the cost of goods sold. Depending on the industry, this may be difficult or impossible. For example, if the company sells most of its products under a long-term contract that has a fixed price, it may not be able to increase the sales price and will be forced to look for other cost-cutting possibilities. Additionally, if the market is competitive, the company might also be unable to increase the sales price.

Solutions to Questions and Problems

NOTE: All end-of-chapter problems were solved using a spreadsheet. Many problems require multiple steps. Due to space and readability constraints, when these intermediate steps are included in this solutions manual, rounding may appear to have occurred. However, the final answer for each problem is found without rounding during any step in the problem.

Basic

1. To find the current assets, we must use the net working capital equation. Doing so, we find:

NWC = Current assets – Current liabilities
$1,410 = Current assets – $5,810
Current assets = $7,220

Now, use this number to calculate the current ratio and the quick ratio. The current ratio is:

Current ratio = Current assets / Current liabilities
Current ratio = $7,220 / $5,810
Current ratio = 1.24 times

And the quick ratio is:

Quick ratio = (Current assets – Inventory) / Current liabilities
Quick ratio = ($7,220 – 1,315) / $5,810
Quick ratio = 1.02 times

2. To find the return on assets and return on equity, we need net income. We can calculate the net income using the profit margin. Doing so, we find the net income is:

Profit margin = Net income / Sales
.08 = Net income / $18,000,000
Net income = $1,440,000

Now we can calculate the return on assets as:

ROA = Net income / Total assets
ROA = $1,440,000 / $13,000,000
ROA = 0.1108 or 11.08%

We do not have the equity for the company, but we know that equity must be equal to total assets minus total debt, so the ROE is:

ROE = Net income / (Total assets – Total debt)
ROE = $1,440,000 / ($13,000,000 – 3,800,000)
ROE = 0.1565 or 15.65%

3. The receivables turnover for the company was:

Receivables turnover = Credit sales / Receivables
Receivables turnover = $6,257,380 / $438,516
Receivables turnover = 14.27 times

Using the receivables turnover, we can calculate the day's sales in receivables as:

Days' sales in receivables = 365 days / Receivables turnover
Days' sales in receivables = 365 days / 14.27
Days' sales in receivables = 25.58 days

The average collection period, which is the same as the day's sales in receivables, was 25.58 days.

4. The inventory turnover for the company was:

Inventory turnover = COGS / Inventory
Inventory turnover = $6,487,318 / $682,173
Inventory turnover = 9.51 times

Using the inventory turnover, we can calculate the days' sales in inventory as:

Days' sales in inventory = 365 days / Inventory turnover
Days' sales in inventory = 365 days / 9.51
Days' sales in inventory = 38.38 days

On average, a unit of inventory sat on the shelf 38.38 days before it was sold.

5. To find the debt-equity ratio using the total debt ratio, we need to rearrange the total debt ratio equation. We must realize that the total assets are equal to total debt plus total equity. Doing so, we find:

Total debt ratio = Total debt / Total assets
0.45 = Total debt / (Total debt + Total equity)
0.55(Total debt) = 0.45(Total equity)
Total debt / Total equity = 0.45 / 0.55
Debt-equity ratio = 0.82

And the equity multiplier is one plus the debt-equity ratio, so:

Equity multiplier = 1 + D/E
Equity multiplier = 1 + 0.82
Equity multiplier = 1.82

6. We need to calculate the net income before we calculate the earnings per share. The sum of dividends and addition to retained earnings must equal net income, so net income must have been:

Net income = Addition to retained earnings + Dividends
Net income = $625,000 + 130,000
Net income = $755,000

So, the earnings per share were:

EPS = Net income / Shares outstanding
EPS = $755,000 / 570,000
EPS = $1.32 per share

The dividends per share were:

Dividends per share = Total dividends / Shares outstanding
Dividends per share = $130,000 / 570,000
Dividends per share = $0.23 per share

The book value per share was:

Book value per share = Total equity / Shares outstanding
Book value per share = $7,200,000 / 570,000
Book value per share = $12.63 per share

The market-to-book ratio is:

Market-to-book ratio = Share price / Book value per share
Market-to-book ratio = $29 / $12.63
Market-to-book ratio = 2.30 times

The P/E ratio is:

P/E ratio = Share price / EPS
P/E ratio = $29 / $1.32
P/E ratio = 21.89 times

Sales per share are:

Sales per share = Total sales / Shares outstanding
Sales per share = $10,500,000 / 570,000
Sales per share = $18.42

The P/S ratio is:

P/S ratio = Share price / Sales per share
P/S ratio = $29 / $18.42
P/S ratio = 1.57 times

7. With the information given, we must use the Du Pont identity to calculate return on equity. Doing so, we find:

ROE = (Profit margin)(Total asset turnover)(Equity multiplier)
ROE = (.07)(1.64)(1.35)
ROE = 0.1550 or 15.50%

8. We can use the Du Pont identity and solve for the equity multiplier. With the equity multiplier we can find the debt-equity ratio. Doing so we find:

ROE = (Profit margin)(Total asset turnover)(Equity multiplier)
0.1430 = (0.08)(1.16)(Equity multiplier)
Equity multiplier = 1.54

Now, using the equation for the equity multiplier, we get:

Equity multiplier = 1 + Debt-equity ratio
1.54 = 1 + Debt-equity ratio
Debt-equity ratio = 0.54

9. To find the days' sales in payables, we first need to find the payables turnover. The payables turnover was:

Payables turnover = Cost of goods sold / Payables balance
Payables turnover = $59,382 / $13,689
Payables turnover = 4.34 times

Now, we can use the payables turnover to find the days' sales in payables as:

Days' sales in payables = 365 days / Payables turnover
Days' sales in payables = 365 days / 4.34
Days' sales in payables = 84.14 days

The company left its bills to suppliers outstanding for 84.14 days on average. A large value for this ratio could imply that either (1) the company is having liquidity problems, making it difficult to pay off its short-term obligations, or (2) that the company has successfully negotiated lenient credit terms from its suppliers.

10. With the information provided, we need to calculate the return on equity using an extended return on equity equation. We first need to find the equity multiplier which is:

Equity multiplier = 1 + Debt-equity ratio
Equity multiplier = 1 + 1.25
Equity multiplier = 2.25
Now we can calculate the return on equity as:

ROE = (ROA)(Equity multiplier)
ROE = 0.075(2.25)
ROE = 0.1688 or 16.88%

The return on equity equation we used was an abbreviated version of the Du Pont identity. If we multiply the profit margin and total asset turnover ratios from the Du Pont identity, we get:

(Net income / Sales)(Sales / Total assets) = Net income / Total assets = ROA

With the return on equity, we can calculate the net income as:

ROE = Net income / Total equity
0.1688 = Net income / $625,000
Net income = $105,469

11. To find the internal growth rate, we need the plowback, or retention, ratio. The plowback ratio is:

$b = 1 – 0.15$
$b = 0.85$

Now, we can use the internal growth rate equation to find:

Internal growth rate = [(ROA)(b)] / [1 – (ROA)(b)]
Internal growth rate = [0.09(0.85)] / [1 – 0.09(0.85)]
Internal growth rate = 0.0828 or 8.28%

12. To find the internal growth rate we need the plowback, or retention, ratio. The plowback ratio is:

$b = 1 – 0.30$
$b = 0.70$

Now, we can use the sustainable growth rate equation to find:

Sustainable growth rate = [(ROE)(b)] / [1 – (ROE)(b)]
Sustainable growth rate = [0.131(0.70)] / [1 – 0.131(0.70)]
Sustainable growth rate = 0.1010 or 10.10%

13. We need the return on equity to calculate the sustainable growth rate. To calculate return on equity, we need to realize that the total asset turnover is the inverse of the capital intensity ratio and the equity multiplier is one plus the debt-equity ratio. So, the return on equity is:

ROE = (Profit margin)(Total asset turnover)(Equity multiplier)
ROE = (0.084)(1/0.45)(1 + 0.60)
ROE = 0.2987 or 29.87%

Next we need the plowback ratio. The payout ratio is one minus the payout ratio. We can calculate the payout ratio as the dividends divided by net income, so the plowback ratio is:

b = 1 – ($40,000 / $95,000)
b = 0.58

Now we can use the sustainable growth rate equation to find:

Sustainable growth rate = [(ROE)(b)] / [1 – (ROE)(b)]
Sustainable growth rate = [0.2987(0.58)] / [1 – 0.2987(0.58)]
Sustainable growth rate = 0.2091 or 20.91%

14. We need the return on equity to calculate the sustainable growth rate. Using the Du Pont identity, the return on equity is:

ROE = (Profit margin)(Total asset turnover)(Equity multiplier)
ROE = (.043)(2.15)(1.62)
ROE = .1498 or 14.98%

To find the sustainable growth rate, we need the plowback, or retention, ratio. The plowback ratio is:

b = 1 – .40
b = .60

Now, we can use the sustainable growth rate equation to find:

Sustainable growth rate = [(ROE)(b)] / [1 – (ROE)(b)]
Sustainable growth rate = [.1498(.60)] / [1 – .1498(.60)]
Sustainable growth rate = .0987 or 9.87%

15. To calculate the common-size balance sheet, we divide each asset account by total assets, and each liability and equity account by total liabilities and equity. For example, the common-size cash percentage for 2009 is:

Cash percentage = Cash / Total assets
Cash percentage = $23,774 / $873,543
Cash percentage = 0.0272 or 2.72%

Repeating this procedure for each account, we get:

	2009		2010	
Assets				
Current assets				
Cash	$23,774	2.72%	$31,437	3.49%
Accounts receivable	57,281	6.56%	77,639	8.62%
Inventory	135,341	15.49%	202,574	22.49%
Total	$216,396	24.77%	$311,650	34.60%
Fixed assets				
Net plant and equipment	$657,147	75.23%	$589,178	65.40%
Total assets	$873,543	100%	$900,828	100%
Liabilities and owners' equity				
Current liabilities				
Accounts payable	$194,922	22.31%	$202,611	22.49%
Notes payable	90,020	10.31%	141,588	15.72%
Total	$284,942	32.62%	$344,199	38.21%
Long-term debt	$247,000	28.28%	$183,750	20.40%
Owners' equity				
Common stock and paid-in surplus	$208,000	23.81%	$208,000	23.09%
Accumulated retained earnings	133,601	15.29%	164,879	18.30%
Total	$341,601	39.11%	$372,879	41.39%
Total liabilities and owners' equity	$873,543	100%	$900,828	100%

16. *a.* The current ratio is calculated as:

Curent ratio = Current assets / Current liabilities

$\text{Current ratio}_{2009}$ = \$216,396 / \$284,942
$\text{Current ratio}_{2009}$ = 0.76 times

$\text{Current ratio}_{2010}$ = \$311,650 / \$344,199
$\text{Current ratio}_{2010}$ = 0.91 times

b. The quick ratio is calculated as:

Quick ratio = (Current assets – Inventory) / Current liabilities

Quick ratio$_{2009}$ = ($216,396 – 135,341) / $284,942
Quick ratio$_{2009}$ = 0.28 times

Quick ratio$_{2010}$ = ($311,650 – 202,574) / $344,199
Quick ratio$_{2010}$ = 0.32 times

c. The cash ratio is calculated as:

Cash ratio = Cash / Current liabilities

Cash ratio$_{2009}$ = $23,744 / $284,942
Cash ratio$_{2009}$ = 0.08 times

Cash ratio$_{2010}$ = $31,437 / $344,199
Cash ratio$_{2010}$ = 0.09 times

d. The debt-equity ratio is calculated as:

Debt-equity ratio = Total debt / Total equity
Debt-equity ratio = (Current liabilities + Long-term debt) / Total equity

Debt-equity ratio$_{2009}$ = ($284,942 + 247,000) / $341,601
Debt-equity ratio$_{2009}$ = 1.56

Debt-equity ratio$_{2010}$ = ($344,199 + 183,750) / $372,879
Debt-equity ratio$_{2010}$ = 1.42

And the equity multiplier is:

Equity multiplier = 1 + Debt-equity ratio

Equity multiplier$_{2009}$ = 1 + 1.56
Equity multiplier$_{2009}$ = 2.56

Equity multiplier$_{2010}$ = 1 + 1.42
Equity multiplier$_{2010}$ = 2.42

e. The total debt ratio is calculated as:

Total debt ratio = Total debt / Total assets
Total debt ratio = (Current liabilities + Long-term debt) / Total assets

Total debt ratio$_{2009}$ = ($284,942 + 247,000) / $873,543
Total debt ratio$_{2009}$ = 0.61

Total debt ratio$_{2009}$ = ($344,199 + 183,750) / $900,828
Total debt ratio$_{2009}$ = 0.59

17. Using the Du Pont identity to calculate ROE, we get:

ROE = (Profit margin)(Total asset turnover)(Equity multiplier)
ROE = (Net income / Sales)(Sales / Total assets)(Total asset / Total equity)
ROE = ($109,381 / $2,156,873)($2,156,873 / $900,828)($900,828 / $372,879)
ROE = 0.2933 or 29.33%

18. One equation to calculate ROA is:

ROA = (Profit margin)(Total asset turnover)

We can solve this equation to find total asset turnover as:

0.09 = 0.08(Total asset turnover)
Total asset turnover = 1.13 times

Now, solve the ROE equation to find the equity multiplier which is:

ROE = (ROA)(Equity multiplier)
0.14 = 0.09(Equity multiplier)
Equity multiplier = 1.56 times

19. To calculate the ROA, we first need to find the net income. Using the profit margin equation, we find:

Profit margin = Net income / Sales
0.0635 = Net income / $22,000,000
Net income = $1,397,000

Now we can calculate ROA as:

ROA = Net income / Total assets
ROA = $1,397,000 / $15,000,000
ROA = 0.0931 or 9.31%

20. To calculate the internal growth rate, we need to find the ROA and the plowback ratio. The ROA for the company is:

ROA = Net income / Total assets
ROA = $11,323 / $94,900
ROA = 0.1193 or 11.93%

And the plowback ratio is:

$b = 1 – .40$
$b = .60$

Now, we can use the internal growth rate equation to find:

Internal growth rate = [(ROA)(b)] / [1 – (ROA)(b)]
Internal growth rate = [0.1193(0.60)] / [1 – 0.1193(.60)]
Internal growth rate = 0.0771 or 7.71%

21. To calculate the sustainable growth rate, we need to find the ROE and the plowback ratio. The ROE for the company is:

ROE = Net income / Equity
ROE = $11,323 / $57,700
ROE = 0.1962 or 19.62%

Using the plowback ratio we calculated in the previous problem, we find the sustainable growth rate is:

Sustainable growth rate = [(ROE)(b)] / [1 – (ROE)(b)]
Sustainable growth rate = [(0.1962)(0.60)] / [1 – (0.1962)(0.60)]
Sustainable growth rate = 0.1335 or 13.35%

22. The total asset turnover is:

Total asset turnover = Sales / Total assets
Total asset turnover = $21,000,000 / $9,500,000 = 2.21 times

If the target total asset turnover is 2.75, we can use the total asset turnover equation to solve for the necessary sales level. The new sales level will be:

Total asset turnover = Sales / Total assets
2.75 = Sales / $9,500,000
Sales = $26,125,000

23. To find the ROE, we need the equity balance. Since we have the total debt, if we can find the total assets we can calculate the equity. Using the total debt ratio, we find total assets as:

Debt ratio = Total debt / Total assets
0.55 = $315,000 / Total assets
Total assets = $572,727

Total liabilities and equity is equal to total assets. Using this relationship, we find:

Total liabilities and equity = Total debt + Total equity
$572,727 = $315,000 + Total equity
Total equity = $257,727

Now, we can calculate the ROE as:

ROE = Net income / Total equity
ROE = $38,250 / $257,727
ROE = 0.1484 or 14.84%

24. The earnings per share are:

EPS = Net income / Shares
EPS = $6,250,000 / 4,100,000
EPS = $1.52

The price-earnings ratio is:

P/E = Price / EPS
P/E = $46 / $1.52
P/E = 30.18

The sales per share are:

Sales per share = Sales / Shares
Sales per share = $39,000,000 / 4,100,000
Sales per share = $9.51

The price-sales ratio is:

P/S = Price / Sales per share
P/S = $46 / $9.51
P/S = 4.84

The book value per share is:

Book value per share = Book value of equity / Shares
Book value per share = $21,580,000 / 4,100,000
Book value per share = $5.26 per share

And the market-to-book ratio is:

Market-to-book = Market value per share / Book value per share
Market-to-book = $46 / $5.26
Market-to-book = 8.74

25. To find the profit margin, we need the net income and sales. We can use the total asset turnover to find the sales and the return on assets to find the net income. Beginning with the total asset turnover, we find sales are:

Total asset turnover = Sales / Total assets
2.35 = Sales / $8,500,000
Sales = $19,975,000

And the net income is:

ROA = Net income / Total assets
0.09 = Net income / $8,500,000
Net income = $765,000

Now we can find the profit margin which is:

Profit margin = Net income / Sales
Profit margin = $765,000 / $19,975,000
Profit margin = 0.0383 or 3.83%

Intermediate

26. We can rearrange the Du Pont identity to calculate the profit margin. So, we need the equity multiplier and the total asset turnover. The equity multiplier is:

Equity multiplier = 1 + Debt-equity ratio
Equity multiplier = 1 + .25
Equity multiplier = 1.25

And the total asset turnover is:

Total asset turnover = Sales / Total assets
Total asset turnover = $7,385 / $3,480
Total asset turnover = 2.12 times

Now, we can use the Du Pont identity to find total sales as:

ROE = (Profit margin)(Total asset turnover)(Equity multiplier)
0.16 = (PM)(2.12)(1.25)
Profit margin = 0.0603 or 6.03%

Rearranging the profit margin ratio, we can find the net income which is:

Profit margin = Net income / Sales
0.0603 = Net income / $7,385
Net income = $445.44

27. This is a multi-step problem in which we need to calculate several ratios to find the fixed assets. If we know total assets and current assets, we can calculate the fixed assets. Using the current ratio to find the current assets, we get:

Current ratio = Current assets / Current liabilities
1.25 = Current assets / $2,385
Current assets = $2,981.25

Now, we are going to use the profit margin to find the net income and use the net income to find the equity. Doing so, we get:

Profit margin = Net income / Sales
0.09 = Net income / $10,435
Net income = $939.15

And using this net income figure in the return on equity equation to find the equity, we get:

ROE = Net income / Total equity
0.14 = $939.15 / Total equity
Total equity = $6,708.21

Now, we can use the long-term debt ratio to find the total long-term debt. The equation is:

Long-term debt ratio = Long-term debt / (Long-term debt + Total equity)

Inverting both sides we get:

1 / Long-term debt ratio = 1 + (Total equity / Long-term debt)
1 / 0.45 = 1 + (Total equity / Long-term debt)
Total equity / Long-term debt = 1.222
$6,708.21 / Long-term debt = 1.222
Long-term debt = $5,488.54

Now, we can calculate the total debt as:

Total debt = Current liabilities + Long-term debt
Total debt = $2,981.25 + 5,488.54
Total debt = $7,873.54

This allows us to calculate the total assets as:

Total assets = Total debt + Total equity
Total assets = $7,873.54 + 6,708.21
Total assets = $14,581.75

Finally, we can calculate the net fixed assets as:

Net fixed assets = Total assets – Current assets
Net fixed assets = $14,581.75 – 2,981.25
Net fixed assets = $11,600.50

28. The child's profit margin is:

Profit margin = Net income / Sales
Profit margin = $1 / $33
Profit margin = 0.0303 or 3.03%

And the store's profit margin is:

Profit margin = Net income / Sales
Profit margin = $11,250,000 / $750,000,000
Profit margin = 0.015 or 1.5%

The advertisement is referring to the store's profit margin, but a more appropriate earnings measure for the firm's owners is the return on equity. The store's return on equity is:

ROE = Net income / Total equity
ROE = Net income / (Total assets – Total debt)
ROE = $11,250,000 / ($310,000,000 – 151,500,000)
ROE = 0.0710 or 7.10%

29. To calculate the profit margin, we first need to calculate the sales. Using the days' sales in receivables, we find the receivables turnover is:

Days' sales in receivables = 365 days / Receivables turnover
25.45 days = 365 days / Receivables turnover
Receivables turnover = 14.34 times

Now, we can use the receivables turnover to calculate the sales as:

Receivables turnover = Sales / Receivables
14.34 = Sales / $146,300
Sales = $2,098,212

So, the profit margin is:

Profit margin = Net income / Sales
Profit margin = $149,850 / $2,098,212
Profit margin = 0.0714 or 7.14%

The total asset turnover is:

Total asset turnover = Sales / Total assets
Total asset turnover = $2,098,212 / $838,000
Total asset turnover = 2.50 times

We need to use the Du Pont identity to calculate the return on equity. Using this relationship, we get:

ROE = (Profit margin)(Total asset turnover)(1 + Debt-equity ratio)
ROE = (0.714)(2.50)(1 + 0.75)
ROE = 0.3129 or 31.29%

30. Here, we need to work the income statement backward to find the EBIT. Starting at the bottom of the income statement, we know that the taxes are the taxable income times the tax rate. The net income is the taxable income minus taxes. Rearranging this equation, we get:

Net income = Taxable income – (t_C)(Taxable income)
Net income = (1 – t_C)(Taxable income)

Using this relationship we find the taxable income is:

Net income = (1 – t_C)(Taxable income)
$8,912 = (1 – .34)(Taxable income)
Taxable income = $13,503.03

Now, we can calculate the EBIT as:

Taxable income = EBIT – Interest
$13,503.03 = EBIT – $3,987
EBIT = $17,490.03

So, the cash coverage ratio is:

Cash coverage ratio = (EBIT + Depreciation expense) / Interest
Cash coverage ratio = ($17,490.03 + 4,873) / $3,987
Cash coverage ratio = 5.61 times

31. To find the times interest earned, we need the EBIT and interest expense. EBIT is sales minus costs minus depreciation, so:

EBIT = Sales – Costs – Depreciation
EBIT = $435,000 – 219,600 – 59,300
EBIT = $156,100

Now, we need the interest expense. We know the EBIT, so if we find the taxable income (EBT), the difference between these two is the interest expense. To find EBT, we must work backward through the income statement. We need total dividends paid. We can use the dividends per share equation to find the total dividends. Doing so, we find:

DPS = Dividends / Shares
$1.25 = Dividends / 20,000
Dividends = $25,000

Net income is the sum of dividends and addition to retained earnings, so:

Net income = Dividends + Addition to retained earnings
Net income = $25,000 + 51,500
Net income = $76,500

We know that the taxes are the taxable income times the tax rate. The net income is the taxable income minus taxes. Rearranging this equation, we get:

Net income = Taxable income – (t_C)(EBT)
Net income = $(1 – t_C)$(EBT)
$76,500 = (1 – .34)(EBT)
EBT = $115,909

Now, we can use the income statement relationship:

EBT = EBIT – Interest
$115,909 = $156,100 – Interest
Interest = $40,191

So, the times interest earned ratio is:

Times interest earned = EBIT / Interest
Times interest earned = $156,100 / $40,191
Times interest earned = 3.88 times

32. To find the return on equity, we need the net income and total equity. We can use the total debt ratio to find the total assets as:

Total debt ratio = Total debt / Total assets
0.35 = $648,000 / Total assets
Total assets = $1,851,429

Using the balance sheet relationship that total assets is equal to total liabilities and equity, we find the total equity is:

Total assets = Total debt + Equity
$1,851,429 = $648,000 + Equity
Equity = $1,203,429

We have the return on equity and the equity. We can use the return on equity equation to find net income is:

ROE = Net income / Equity
0.1430 = Net income / $1,203,429
Net income = $172,090

We have all the information necessary to calculate the ROA, Doing so, we find the ROA is:

ROA = Net income / Total assets
ROA = $172,090 / $1,851,429
ROA = 0.0930 or 9.30%

33. The currency is generally irrelevant in calculating any financial ratio. The company's profit margin is:

Profit margin = Net income / Sales
Profit margin = –£24,382 / £489,162
Profit margin = –0.0498 or –4.98%

As long as both net income and sales are measured in the same currency, there is no problem; in fact, except for some market value ratios like EPS and BVPS, none of the financial ratios discussed in the text are measured in terms of currency. This is one reason why financial ratio analysis is widely used in international finance to compare the business operations of firms and/or divisions across national economic borders.

We can use the profit margin we previously calculated and the dollar sales to calculate the net income. Doing so, we get:

Profit margin = Net income / Sales
–0.0498 = Net income / $695,266
Net income = –$34,655.14

34. Here, we need to calculate several ratios given the financial statements. The ratios are:

Short-term solvency ratios:

Current ratio = Current assets / Current liabilities

Current ratio$_{2009}$ = $20,476 / $3,949
Current ratio$_{2009}$ = 5.19 times

Current ratio$_{2010}$ = $23,150 / $4,739
Current ratio$_{2010}$ = 4.88 times

Quick ratio = (Current assets – Inventory) / Current liabilities

Quick ratio$_{2009}$ = ($20,476 – 12,398) / $3,949
Quick ratio$_{2009}$ = 2.05 times

Quick ratio$_{2010}$ = ($23,150 – 13,822) / $4,739
Quick ratio$_{2010}$ = 1.97 times

Cash ratio = Cash / Current liabilities

Cash ratio$_{2009}$ = $3,291 / $3,949
Cash ratio$_{2009}$ = 0.83 times

Cash ratio$_{2010}$ = $3,507 / $4,739
Cash ratio$_{2010}$ = 0.74 times

Asset utilization ratios:

Total asset turnover = Sales / Total assets
Total asset turnover = $186,570 / $96,119
Total asset turnover = 1.94 times

Inventory turnover = COGS / Inventory
Inventory turnover = $125,803 / $13,822
Inventory turnover = 9.10 times

Receivables turnover = Sales / Receivables
Receivables turnover = $186,570 / $5,821
Receivables turnover = 32.05 times

Long-term solvency ratios:

Total debt ratio = (Current liabilities + Long-term debt) / Total assets

Total debt ratio$_{2009}$ = ($3,949 + 13,800) / $69,383
Total debt ratio$_{2009}$ = 0.26

Total debt ratio$_{2010}$ = ($4,739 + 16,560) / $96,119
Total debt ratio$_{2010}$ = 0.22

Debt-equity ratio = (Current liabilities + Long-term debt) / Total equity

Debt-equity ratio$_{2009}$ = ($3,949 + 13,800) / $51,634
Debt-equity ratio$_{2009}$ = 0.34

Debt-equity ratio$_{2010}$ = ($4,739 + 16,560) / $74,820
Debt-equity ratio$_{2010}$ = 0.28

Equity multiplier = 1 + D/E ratio

Equity multiplier$_{2009}$ = 1 + 0.34
Equity multiplier$_{2009}$ = 1.34

Equity multiplier$_{2010}$ = 1 + 0.28
Equity multiplier$_{2010}$ = 1.28

Times interest earned = EBIT / Interest
Times interest earned = $55,394 / $1,470
Times interest earned = 37.68 times

Cash coverage ratio = (EBIT + Depreciation) / Interest
Cash coverage ratio = ($55,394 + 5,373) / $1,470
Cash coverage ratio = 41.34 times

Profitability ratios:

Profit margin = Net income / Sales
Profit margin = $35,051 / $186,570
Profit margin = 0.1879 or 18.79%

Return on assets = Net income / Total assets
Return on assets = $35,051 / $96,119
Return on assets = 0.3647 or 36.47%

Return on equity = Net income / Total equity
Return on equity = $35,051 / $74,820
Return on equity = 0.4685 or 46.85%

35. The Du Pont identity is:

ROE = (PM)(Total asset turnover)(Equity multiplier)
ROE = (Net income / Sales)(Sales / Total assets)(Total assets / Total equity)
ROE = ($35,051 / $186,570)($186,570 / $96,119)($96,119 / $74,820)
ROE = 0.4685 or 46.85%

36. To find the price-earnings ratio we first need the earnings per share. The earnings per share are:

EPS = Net income / Shares outstanding
EPS = $35,051 / 10,000
EPS = $3.51

So, the price-earnings ratio is:

P/E ratio = Share price / EPS
P/E ratio = $73 / $3.51
P/E ratio = 20.83

The sales per share are:

Sales per share = Sales / Shares outstanding
Sales per share = $186,570 / 10,000
Sales per share = $18.66

So, the price-sales ratio is:

P/S ratio = Share price / Sales per share
P/S ratio = $73 / $18.66
P/S ratio = 3.91

The dividends per share are:

Dividends per share = Total dividends /Shares outstanding
Dividends per share = $11,865 / 10,000 shares
Dividends per share = $1.19 per share

To find the market-to-book ratio, we first need the book value per share. The book value per share is:

Book value per share = Total equity / Shares outstanding
Book value per share = $74,820 / 10,000 shares
Book value per share = $7.48 per share

So, the market-to-book ratio is:

Market-to-book ratio = Share price / Book value per share
Market-to-book ratio = $73 / $7.48
Market-to-book ratio = 9.76 times

37. The current ratio appears to be relatively high when compared to the median; however, it is below the upper quartile, meaning that at least 25 percent of firms in the industry have a higher current ratio. Overall, it does not appear that the current ratio is out of line with the industry. The total asset turnover is low when compared to the industry. In fact, the total asset turnover is in the lower quartile. This means that the company does not use assets as efficiently overall or that the company has newer assets than the industry. This would mean that the assets have not been depreciated, which would mean a higher book value and a lower total asset turnover. The debt-equity ratio is in line with the industry, between the mean and the lower quartile. The profit margin is in the upper quartile. The company may be better at controlling costs, or has a better product which enables it to charge a premium price. It could also be negative in that the company may have too high of a margin on its sales, which could reduce overall net income.

38. To find the profit margin, we can solve the Du Pont identity. First, we need to find the retention ratio. The retention ratio for the company is:

$b = 1 – 0.25$
$b = 0.75$

Now, we can use the sustainable growth rate equation to find the ROE. Doing so, we find:

Sustainable growth rate = [(ROE)(*b*)] / [1 – (ROE)(*b*)]
0.08 = [ROE(0.75)] / [1 – ROE(0.75)]
ROE = 0.0988 or 9.88%

Now, we can use the Du Pont identity. We are given the total asset to sales ratio, which is the inverse of the total asset turnover, and the equity multiplier is one plus the debt-equity ratio. Solving the Du Pont identity for the profit margin, we find:

ROE = (Profit margin)(Total asset turnover)(Equity multiplier)
0.0988 = (Profit margin)(1 / 1.20)(1 + 0.55)
Profit margin = 0.0765 or 7.65%

39. The earnings per share is the net income divided by the shares outstanding. Since all numbers are in millions, the earnings per share for Abercrombie & Fitch was:

EPS = $475.70 / 87.05
EPS = $5.46

And the earnings per share for Ann Taylor were;

EPS = $97.24 / 57.10
EPS = $1.70

The market-to-book ratio is the stock price divided by the book value per share. To find the book value per share, we divide the total equity by the shares outstanding. The book value per share and market-to-book ratio for Abercrombie & Fitch was:

Book value per share = $1,618.31 / 87.05
Book value per share = $18.59

Market-to-book = $80.59 / $18.59
Market-to-book = 4.33

And the market-to-book ratio for Ann Taylor was:

Book value per share = $839.48 / 57.10
Book value per share = $14.70

Market-to-book = $25.26 / $14.70
Market-to-book = 1.72

And the price-earnings ratio for Abercrombie & Fitch was:

P/E = $80.59 / $5.46
P/E = 14.75

And for Ann Taylor, the P/E was:

P/E = $25.26 / $1.70
P/E = 14.83

40. To find the total asset turnover, we can solve the ROA equation. First, we need to find the retention ratio. The retention ratio for the company is:

b = 1 – 0.30
b = 0.70

Now, we can use the internal growth rate equation to find the ROA. Doing so, we find:

Internal growth rate = [(ROA)(b)] / [1 – (ROA)(b)]
0.065 = [ROA(0.70)] / [1 – ROA(0.70)]
ROA = 0.0872 or 8.72%

Now, we can use the ROA equation to find the total asset turnover is:

ROA = (PM)(TAT)
0.0872 = (0.052)TAT
Total asset turnover = 1.68 times

41. To calculate the sustainable growth rate, we need to calculate the return on equity. We can use the Du Pont identity to calculate the return on equity if we can find the equity multiplier. Using the total debt ratio, we can find the debt-equity ratio is:

Total debt ratio = Total debt / Total assets
0.30 = Total debt / Total assets
1 / 0.30 = Total assets / Total debt
1 / 0.30 = (Total debt + Total equity) / Total debt
1 / 0.30 = 1 + Total equity / Total debt
Total equity / Total debt = (1 / 0.30) – 1
Total debt / Total equity = 1 / [(1 /0.30) – 1]
Total debt / Total equity = 0.43
Debt-equity ratio = 0.43

So, the equity multiplier is:

Equity multiplier = 1 + Debt-equity ratio
Equity multiplier = 1 + 0.43
Equity multiplier = 1.43

Using the Du Pont identity, the ROE is:

ROE = (Profit margin)(Total asset turnover)(Equity multiplier)
ROE = (.0430)(2.10)(1.43)
ROE = 0.1290 or 12.90%

To calculate the sustainable growth rate, we also need the retention ratio. The retention ratio is:

$b = 1 – 0.15$
$b = 0.85$

Now we can calculate the sustainable growth rate as:

Sustainable growth rate = [(ROE)(b)] / [1 – (ROE)(b)]
Sustainable growth rate = [0.1290(0.85)] / [1 – 0.1290(0.85)]
Sustainable growth rate = 0.1232 or 12.32%

And the return on assets is:

ROA = (Profit margin)(Total asset turnover)
ROA = (0.0430)(2.10)
ROA = 0.0903 or 9.03%

42. To find the sustainable growth rate, we need the retention ratio and the return on equity. The payout ratio is the dividend payment divided by net income, so:

$b = 1 – (\$5,800 / \$17,000)$
$b = 0.6588$

And the return on equity is:

ROE = Net income / Total equity
ROE = $17,000 / $84,000
ROE = 0.2024 or 20.24%

So, the sustainable growth rate is:

Sustainable growth rate = [(ROE)(b)] / [1 – (ROE)(b)]
Sustainable growth rate = [0.2024(0.6588)] / [1 – 0.2024(0.6588)]
Sustainable growth rate = 0.1538 or 15.38%

The total assets of the company are equal to the total debt plus the total equity. The total assets will increase at the sustainable growth rate, so the total assets next year will be:

New total assets = (1 + Sustainable growth rate)(Total assets)
New total assets = (1 + 0.1538)($53,000 + 84,000)
New total assets = $158,076.92

We can find the new total debt amount by multiplying the new total assets by the debt-equity ratio. Doing so, we find the new total debt is:

New total debt = [Total debt / (Total debt + Total equity)](New total assets)
New total debt = [$53,000 / ($53,000 + 84,000)]($158,076.92)
New total debt = $61,153.85

The additional borrowing is the difference between the new total debt and the current total debt, so:

Additional borrowing = New total debt – Current total debt
Additional borrowing = $61,153.85 – 53,000
Additional borrowing = $8,153.85

The growth rate that could be achieved with no outside financing at all is the internal growth rate. To find the internal growth rate we first need the return on assets, which is:

ROA = Net income / Total assets
ROA = $17,000 / ($53,000 + 84,000)
ROA = 0.1241 or 12.41%

So, the internal growth rate is:

Internal growth rate = [(ROA)(*b*)] / [1 – (ROA)(*b*)]
Internal growth rate = [(0.1241)(0.6588)] / [1 – (0.1241)(0.6588)]
Internal growth rate = .0890 or 8.90%

43. We can find the payout ratio from the sustainable growth rate formula. First, we need the return on equity. Using the Du Pont identity, we find the return on equity is:

ROE = (Profit margin)(Total asset turnover)(Equity multiplier)
ROE = (0.05)(1.20)(1 + 0.30)
ROE = 0.0780 or 7.80%

Now we can use the sustainable growth rate equation to find the retention ratio, which is:

Sustainable growth rate = [(ROE)(*b*)] / [1 – (ROE)(*b*)]
0.13 = [0.0780(*b*)] / [1 – 0.0780(*b*)]
b = 1.47

So, the payout ratio is:

Payout ratio = 1 – *b*
Payout ratio = 1 – 1.47
Payout ratio = –0.47 or –47%

This is a negative dividend payout ratio of 147%, which is impossible; the growth rate is not consistent with the other constraints. The lowest possible payout rate is zero, which corresponds to retention ratio of one, or total earnings retention. The maximum sustainable growth rate for this company is:

Sustainable growth rate = [(ROE)(*b*)] / [1 – (ROE)(*b*)]
Sustainable growth rate = [0.0780(1)] / [1 – 0.0780(1)]
Sustainable growth rate = 0.0846 or 8.46%

44. Using the beginning of period total assets, the ROA is:

ROA_{Begin} = \$1,407 / \$13,570
ROA_{Begin} = .1037 or 10.37%

Using the end of period total assets, the ROA is:

ROA_{End} = \$1,407 / \$12,758
ROA_{End} = .1103 or 11.03%

The ROE using beginning of period equity is:

ROE_{Begin} = \$1,407 / \$6,201
ROE_{Begin} = .2269 or 22.69%

The ROE using the end of period equity is:

ROE_{End} = \$1,407 / \$4,484
ROE_{End} = .3138 or 31.38%

The retention ratio, which is one minus the dividend payout ratio, is:

b = 1 – Dividends/Net income
b = 1 – \$204 / \$1,407
b = .8550 or 85.50%

With the growth rate equations, we need to use the ROA and ROE based on the end of period assets or equity, so the internal growth rate is:

Internal growth rate = [(ROA)(b)] / [1 – (ROA)(b)]
Internal growth rate = [(.1103)(.8550)] / [1 – (.1103)(.8550)]
Internal growth rate = .1041 or 10.41%

And the sustainable growth rate is:

Sustainable growth rate = [(ROE)(b)] / [1 – (ROE)(b)]
Sustainable growth rate = [(.3138)(.8550)] / [1 – (.3138)(.8550)]
Sustainable growth rate = .3667 or 36.67%

Using ROA × b and end of period assets to find the internal growth rate, we find:

Internal growth rate = $ROA_{End} \times b$
Internal growth rate = .1103 × .8550
Internal growth rate = .0943 or 9.43%

And, using ROE × *b* and the end of period equity to find the sustainable growth rate, we find:

Sustainable growth rate = $ROE_{End} \times b$
Sustainable growth rate = .3138 × .8550
Sustainable growth rate = .2683 or 26.83%

Using ROA × *b* and beginning of period assets to find the internal growth rate, we find:

Internal growth rate = $ROA_{Begin} \times b$
Internal growth rate = .1037 × .8550
Internal growth rate = .0887 or 8.87%

And, using ROE × *b* and the beginning of period equity to find the sustainable growth rate, we find:

Sustainable growth rate = $ROE_{Begin} \times b$
Sustainable growth rate = .2269 × .8550
Sustainable growth rate = .1940 or 19.40%

45. The expanded Du Pont table is shown on the next page. The ROE is 88.99%.