CHAPTER 3
EVALUATION OF FINANCIAL PERFORMANCE

ANSWERS TO QUESTIONS:

1. The primary limitations of ratio analysis as a technique of financial statement analysis are:

   a. Ratios are retrospective and do not directly incorporate forecasts of future performance of a firm.
   b. Ratios only indicate potential problem areas; they do not identify causes of problems.
   c. A good financial analyst must select the set of ratios that is most appropriate for the type of firm being analyzed.
   d. Ratios do not provide absolute measures for evaluation; rather they must be analyzed against some standard. The choice of an appropriate standard for comparison can sometimes be a difficult one.

2. The major limitation of the current ratio as a measure of liquidity is the inclusion in the current assets figure of some assets that may not be highly liquid, such as inventory and, in some cases, accounts receivable. The quick ratio, which does not consider inventories, helps to offset this problem.

   Another limitation is the fact that it is a static (based on the balance sheet) measure of liquidity, whereas liquidity is a dynamic (flow) concept. Also, the current ratio may be easily manipulated by the firm. For example, a firm with a current ratio greater than 1x can increase that ratio by using cash to pay off some current liabilities. End-of-year balance sheet manipulation such as this is common among firms having current ratio constraints imposed as part of their financing agreements.

3. **Above:** The firm is having collection problems, possibly because of too liberal a credit granting policy, inadequate collection efforts, or failure to write off uncollectible accounts.

   Below: The company may be unduly restrictive in granting credit and therefore it may be losing some otherwise profitable accounts to competitors.

4. **Above:** The company may be carrying too little inventory and thus may be subject to frequent and significant "stock-out" costs. A strategy of carrying a small inventory may cause the company to lose customers.

   Below: The company may have a lot of slow-moving or obsolete inventory. It may also not be making use of efficient inventory management techniques.

5. The fixed asset turnover ratio is subject to four major limitations in comparative analyses. The ratio is sensitive to:

   a. The cost of the assets at the date of acquisition.
   b. The length of time since acquisition.
   c. The depreciation policies adopted.
   d. The extent to which fixed assets are leased rather than owned.

   Each of these factors will differ from firm to firm, making meaningful comparative analyses difficult.

6. The three most important determinants of a firm's return on stockholders' equity are net profit margin (earnings after tax/sales), the total asset turnover (sales/total assets), and the equity multiplier (total assets/stockholders' equity).

7. Alternative accounting procedures can have a significant impact on the validity of comparative financial analyses. Three of the most significant areas for disagreement between firms are inventory valuation (LIFO vs. FIFO, for example), depreciation methods (straight line, accelerated or MACRS depreciation), and the treatment of financial leases (capitalized or not). Any one of these items can limit comparability between firms.

8. Inflation can impact the comparability of financial ratios between firms in a number of ways. One important example is the existence of inventory profits in a period of rising prices. If a firm uses FIFO, it will show higher profits (and a larger balance sheet inventory figure) in times of rising prices than a firm using LIFO. Inflation also affects the cost of fixed assets and the depreciation charged against these assets. Firms that own older assets will tend to report higher profits than firms with newly acquired assets. The use of replacement cost accounting can offset these problems.

9. The P/E multiple indicates how much investors are willing to pay for each dollar of current earnings. With a greater level of risk, investors will offer less for a dollar of earnings because of that risk. Also, the greater the growth prospects of the firm's earnings, the more investors will be willing to pay for a dollar of current earnings.

10. Generally earnings quality is enhanced the greater the cash portion of earnings and the more the earnings are composed of recurring, as opposed to non-recurring items. Balance sheet quality is enhanced the greater the inclusion of tangible, as opposed to intangible assets. Also, the more nearly the asset values reported on a balance sheet are reflective of their actual market values, the higher the balance sheet quality.

11. A lower P/E ratio can be expected for a typical natural gas utility than for a computer technology firm because the growth prospects are much lower for the utility. Offsetting this to some extent is a lower perceived risk of the utility.

12. Write-offs of non-performing assets should increase the future profitability ratios (e.g., return on assets and common equity) since the firm's total assets and retained earnings (part of common equity) will be lower. It also should increase the financial leverage ratios

because retained earnings (part of common equity) will be lower. Over the long run, the write-offs of non-performing assets should increase the market value of the firm's equity securities, because any proceeds from the sales of these assets can be reinvested in more profitable assets (i.e., assets with higher expected rates of return).

13. a. The bank must have a lower equity multiplier than other banks in the industry, on average. That is the bank is employing more equity (for a given level of total assets) compared with other banks.
b. A low equity multiplier implies that the bank is following a fairly conservative financial leverage policy, which would lead to lower required rates of return on its debt (k_d) and equity (k_e) securities, all other things being equal. Hence, all other things being equal, this should lead to higher bond and stock prices. However, the bank may be earning above-average returns on its assets by investing in higher risk assets compared with other banks. This would lead to higher required rates of return on its debt and equity securities and thus, all other things being equal, lower bond and stock prices. The answer cannot be determined without more information on the relative riskiness of the bank's assets.

14. MVA (market value added) is equal to the present value of expected future EVA (economic value added). EVA is the incremental contribution of a firm's operations to the creation of MVA.

SOLUTIONS TO PROBLEMS:

1. The stock of both firms likely is valued on the basis of the projected earning capacity of the firm. Obviously, the earning capacity of the assets of Jenkins is not impressive relative to depreciated cost of the assets the firm has in place. If Jenkins were to liquidate, it is doubtful if the company would be able to sell its assets for their book value because of their depressed earning capacity. In contrast, Dataquest's earnings are not closely related to its tangible assets. For a software firm, these assets are likely to be relatively small. The largest asset of a software development firm is its human "capital". Having the copyright on a leading piece of software can generate large projected earnings streams, and consequently a high market to book ratio.

2. No recommended solution.

3.

Profiteers, Inc.	2006	2007	2008	2009	2010
ROI	17.64%	14.64%	13.20%	10.71%	12.10%
ROE	23.64	20.50	21.25	17.67	19.72

Industry Average					
ROI	15.00%	13.97%	14.30%	13.10%	13.40%
ROE	21.30	20.26	21.02	19.78	20.50

In the face of declining profit margins and less than average efficiency of asset utilization, Profiteers has maintained its ROE by using more financial leverage.

4. Cost of sales = 0.5($290,000,000) = $145,000,000

Inventory turnover (beginning of year inventory)

= $145,000,000/$25,000,000 = **5.8x**

Inventory turnover (end of year inventory)

= $145,000,000/$30,000,000 = **4.83x**

Monthly average inventory = $43,333,333

Inventory turnover (monthly average inventory)

= $145,000,000/$43,333,333 = **3.35x**

Because of the seasonal nature of Palmer's business, the monthly average inventory turnover is more indicative of the success of Palmer's inventory management.

5. a. Return on equity = $600,000/$2,400,000 = **0.25 or 25%**

b. Sales = $600,000/.10 = $6,000,000

Total asset turnover = $6,000,000/$4,000,000 = **1.5x**

Equity multiplier = $4,000,000/$2,400,000 = **1.67x**

Gulf combines a significantly higher than average profit margin (10% vs. 6%) and a somewhat higher equity multiplier (1.67x vs. 1.4x) with a significantly lower than average total asset turnover to achieve results that are greater than the industry average return on equity (25% vs. 21%). However, the higher equity multiplier of Gulf indicates a higher level of financial risk. This offsets, at least in part, the value of the higher achieved returns.

6. a. Jackson's current ratio is 1.88x compared to the industry average of 2.5 times. Jackson's quick ratio is 0.66x compared to an industry average of 1.1x. Jackson has net working capital of $750,000. Jackson's liquidity is considerably below that of the

industry average. Based on a comparison of the firm's current ratio to that of the industry and the firm's quick ratio to that of the industry, there is some evidence that Jackson may carry excessive or slow moving inventory.

b. The company has an average collection period of 38.9 days compared to an industry average of 35 days. The company's inventory turnover ratio is only 1.73x compared to an industry average of 2.4x. This provides additional evidence of Jackson's potential inventory problems. Finally, Jackson's total asset turnover ratio of 1.25x is below the industry average of 1.4x, probably because of the inventory problems and the slightly higher than average receivables balance.

c. The company's times interest earned ratio is 2.89x compared to the industry average of 3.5x. The company's total assets to stockholders' equity ratio is 3.2x compared to the industry average of 3.0x. This slightly higher amount of financial leverage and significantly lower interest coverage ratio suggest that Jackson either pays very high interest charges relative to other firms, is less profitable than the average firm or a combination of both. In any case the firm appears to have more financial risk than the average firm.

d. Jackson's net profit margin of 4.44% exceeds the industry average of 4.0%. The company's return on investment of 5.56% is only slightly below the industry average of 5.6%. Jackson's return on stockholders' equity of 17.78% exceeds the industry average of 16.8% because of the higher level of financial leverage used by Jackson.

e. Jackson seems to be carrying excessive inventory, resulting in a lower asset turnover. The company's liquidity position is also weak (quick ratio). In spite of these areas for potential improvement, the firm has outperformed the average firm in the industry and has assumed more financial risk in doing this.

f. ROE = Net profit margin *times* Total asset turnover *times* Equity multiplier

ROE = ($133,320/$3,000,000) x ($3,000,000/$2,400,000) x ($2,400,000/$750,000)

ROE = 0.1778 or 17.8%

The primary area for improvement is total asset turnover (especially inventories).

g. The biggest factor that can explain Jackson's lower P/E ratio relative to the industry average is the higher amount of financial risk the firm possesses. Also, Jackson could be perceived as having a lower growth potential than the average firm, although there is no direct evidence presented in the data to indicate this.

7. a. EAT = $12 million

EBT = EAT/(1 - T)

= $12 million / (1 -0.40) = $20 million

EBIT = EBT + I

= $20 million + $5 million = $25 million

Times Interest Earned = EBIT/I

= $25 million/$5 million = **5.0 times**

b. Interest = EBIT/Times Interest Earned

= $25 million/3.50 = $7.14 million

Additional interest = $7.14 million - $5 million = $2.14 million

Additional debt = Additional interest/Interest rate

= $2.14 million/0.10 = **$21.4 million**

c. Additional debt = $2.14 million/0.12 = **$17.83 million**

As interest rates increase, the firm's debt capacity (as measured by the times interest earned ratio) decreases.

8. Hoffman's present debt ratio is 44.25% ($500,000 / $1,130,000). Hoffman could borrow an additional $130,000 and still maintain its debt ratio at 50%:

0.5 = ($500,000 + X) / ($1,130,000 + X)

X = $130,000

If Hoffman borrows $130,000 on a short-term basis and invests this amount in inventory and receivables, its current ratio remains above 1.5 times.

Current ratio = ($450,000 + $130,000) / ($200,000 + $130,000)

= 1.76

Therefore, Hoffman can borrow up to $130,000 without violating the terms of its borrowing agreement.

9.

Forecasted Balance Sheet

Cash	$128,500	Accounts payable	$164,250
Accounts receivable	200,000	Total current liabilities	$164,250
Inventory	164,250	Long-term debt	$200,750
Total current assets	$492,750	Stockholders' equity	$547,500
Fixed assets	419,750	Total liabilities	
Total assets	$912,500	and equity	$912,500

a. Total assets = $3,650,000/4 = $912,500

b. Total debt = .40($912,500) = $365,000

Stockholders' equity = $912,500 — $365,000 = $547,500

c. Current liabilities = .30($547,500) = $164,250

d. Accounts payable = $164,250

e. Current assets = 3($164,250) = $492,750

f. Fixed assets = $912,500 — $492,750 = $419,750

g. Accounts receivable = ($3,650,000/365)(20) = $200,000

h. ($492,750-Inventory)/$164,250 = 2

Inventory = $164,250

i. Cash = $492,750 — $200,000 — $164,250 = $128,500

j. Long-term debt = $365,000 — $164,250 = $200,750

k. Total liabilities and equity = $912,500

10. a. Return on stockholders' equity = 0.03 x ($20,000,000)/$10,000,000) x ($10,000,000/$4,000,000)

= **0.15 or 15%**

b. Return on stockholders' equity = 0.05 x 2.0 x 2.5 = **0.25 or 25%**

11. Credit sales = 0.8($40 million) = $32 million

Average daily credit sales = $32 million/365 days/yr.

= $87,671.23

Average accounts receivable = 45 x $87,671.23 = **$3,945,205**

12. a. EPS = EAT / (Average number of shares outstanding)

= $21,000,000/5,000,000 = **$4.20**

b. Price/earnings ratio = Market price/EPS

= $32/$4.20 = **7.6**

c. Book value per share = (Common stock + Contributed capital in excess of par value + Retained earnings)/(Average number of shares outstanding)

= ($5,000,000 + $20,000,000 + $55,000,000)/5,000,000

= **$16**

d. P/BV = $32 / $16 = **2.0**

e. Addition to retained earnings = net income - dividends

= $21 million - $10 million = **$11 million**

f.

Balance Sheet

Current assets	$ 60	Current liabilities	$ 20
Fixed assets, net	110	Long-term debt	40
		Common stock ($1 par)	6
		Contributed capital in excess of par value	49
		Retained earnings	55
	$170		$170

13. a. 50 days = Accounts Receivable/($1,600,000/365 days)

50 days = Accounts Receivable/$4,383.56

Accounts Receivable = **$219,178**

b. Cost of sales = (1 - 0.35)($1,600,000) = $1,040,000

Inventory Turnover = 6 = Cost of Sales/Average Inventory

6 = $1,040,000/Average Inventory

Average Inventory = **$173,333**

14. a. **Current ratio** = $5,750/$3,000 = **1.92 (no change)**

Quick ratio = ($5,750 — $2,000)/$3,000 = **1.25 (increase)**

Debt-to-equity ratio = $4,750/$6,000 = **0.79 (no change)**

b. **Current ratio** = $5,250/$3,000 = **1.75 (decrease)**

Quick ratio = ($5,250 — $2,500)/$3,000 = **0.92 (decrease)**

Debt-to-equity ratio = $4,750/$6,000 = **0.79 (no change)**

c. **Current ratio** = $6,250/$3,500 = **1.79 (decrease)**

Quick ratio = ($6,250 — $3,000)/$3,500 = **0.93 (decrease)**

Debt-to-equity ratio = $5,250/$6,000= **0.88 (increase)**

d. **Current ratio** = $5,750/$3,000 = **1.92 (no change)**

Quick ratio = ($5,750 — $2,500)/$3,000 = **1.08 (no change)**

Debt-to-equity ratio = $6,750/$6,000 = **1.13 (increase)**

e. **Current ratio** = $5,750/$3,000 = **1.92 (no change)**

Quick ratio = ($5,750 — $2,500)/$3,000 = **1.08 (no change)**

Debt-to-equity ratio = $4,750/$8,000 = **0.59 (decrease)**

15. a. No improvement in liquidity, because the cash that is raised is tied up in a very non-liquid asset.

b. No improvement in liquidity, because the firm's most liquid assets (cash and marketable securities) are consumed. Even though the current ratio will increase, liquidity will actually decline.

c. Yes, because the debt service on long-term debt is normally less than on short-term debt. There is no immediate refinancing risk on long-term debt. More cashflow will be available for other uses.

d. Yes, because non-liquid assets become liquid assets.

16. a. The current ratio will increase because of the current asset increase.

b. The return on stockholders' equity will decline because of the increase in

stockholders' equity, assuming no immediate impact on profits from increasing inventory.

c. The quick ratio will increase because of the cash balance increase.

d. The debt to total assets ratio will decline because of the increase in total assets.

e. The total asset turnover ratio will decline because of the increase in total assets.

17. a. Return on equity = $2,000,000/$7,000,000 = **28.57%**

b. Keystone's net profit margin (8%) is significantly below the industry average of 10%. Sales for Keystone are $25,000,000 ($2 million/0.08). Keystone's total asset turnover ratio is 1.5625x, compared to the industry average of 2.0 times. Keystone has made up for these deficiencies by assuming considerably more financial risk (equity multiplier of 2.29x vs. an industry average of 1.5 times). Thus, overall Keystone's return on equity is below the industry average of 30% and its level of financial risk is higher.

c. Quick ratio = (Current assets - Inventories) / Current liabilities
= ($6 million - $3.2 million) / $3.5 million
= **0.80**

18. Return on stockholders' equity = 18% = (EAT/Sales) x 1.0 x 2.0
EAT/ Sales = **9.0%**

19. a.

	Firm			
	A	B	C	D
Total Asset Turnover	1.33x	1.33x	1.00x	1.04x
Net Profit Margin	0.15	0.05	0.15	0.12
Equity Multiplier	1.50x	1.50x	1.07x	2.40x
Return on Equity	0.30	0.10	0.16	0.30

b. Firm A appears to have few problems in comparison with the other firms.

Firm B has a very weak profit margin, indicating the need for corrective action to control costs or to change the firm's pricing strategy.

Firm C has a low asset turnover, suggesting the existence of excessive investments in fixed assets and/or short-term assets. The low equity multiplier suggests that the firm has not made as much use of debt as the competing firms. This low turnover and low equity multiplier have combined to give Firm C a lower than average return on equity.

Firm D has a lower than average asset turnover and an average profit margin. The high return on equity has doubtlessly been earned by assuming a very risky (debt-heavy) capital structure. This heavy use of debt exposes the firm to substantial financial risk.

More detail about the determinants of the net profit margin and the total asset turnover ratio would be valuable. This information could be in the form of a Dupont chart. Also, it would be useful to know if all firms use similar financial reporting methods.

20. a. Current ratio = \$3.0/\$1.5 = **2x**

Quick ratio = (\$3.0 - \$1.0)/\$1.5 = **1.33x**

b. Current ratio = (\$3.0 - \$0.25)/(\$1.5 - \$0.25) = **2.2x**

Quick ratio = (\$3.0 - \$1.0 - \$0.25)/(\$1.5 - \$0.25) = **1.4x**

Both the current and quick ratios rise, even though real liquidity has declined (cash balances are cut in half).

c. Current ratio = (\$3.0 - \$0.5)/(\$1.5 - \$0.5) = **2.5x**

Quick ratio = (\$3.0 - \$1.0 - \$0.5)/(\$1.5 - \$0.5) = **1.5x**

Both the current and the quick ratios rise.

d. Current ratio = (\$3.0 + \$1.0)/\$1.5 = **2.67x**

Quick ratio = (\$3.0 - \$1.0 + \$1.0)/\$1.5 = **2.0x**

Both the current and the quick ratios rise.

e. These examples illustrate how easy it is for a firm to manipulate its current and quick ratios, if necessary. Consequently, conclusions based on an analysis of these ratios should be viewed with caution.

21. Reduction in accounts receivable = \$5 million (20 days x \$0.25 million per day)

New total assets after stock repurchase = \$95 million

New common equity after stock repurchase = \$35 million

Debt ratio: Old = 60%

New = **63%** (\$60/\$95)

Return on assets: Old = 5% (\$5/\$100)

New = **5.26%** (\$5/\$95)

Return on common equity: Old = 12.5% (\$5/\$40)

New = **14.29%** (\$5/\$35)

22. Forecasted Balance Sheet

Cash	$104,000		
Accounts receivable	1,096,000	Total current liabilities	$1,200,000
Inventory	1,200,000	Long term debt	2,800,000
Total current assets	$2,400,000	Total debt	$4,000,000
Net fixed assets	7,600,000	Stockholders' equity	6,000,000
Total assets	$10,000,000	Total liabilities and stockholders' equity	$10,000,000

a. Profit margin on sales = 0.05 = $1,000,000/Sales

Sales = $20,000,000

b. Total asset turnover = 2 = $20,000,000/Total assets

Total assets = $10,000,000

c. Total debt to total assets = 0.4 = Total debt/$10,000,000

Total debt = $4,000,000

d. Current liabilities to stockholders' equity = 0.2 = Current liabilities/$6,000,000

Current liabilities = $1,200,000

e. Current ratio = 2 = Current assets/$1,200,000

Current assets = $2,400,000

f. Fixed assets = Total assets minus current assets

= $10,000,000 - $2,400,000 = $7,600,000

g. Quick ratio = 1 = ($2,400,000 - Inventories)/$1,200,000

Inventories = $1,200,000

h. Average collection period = 20 days

= Accounts receivable/($20,000,000/365)

Accounts receivable = $1,096,000 (rounded to the nearest $1,000)

i. Cash = Current assets minus accounts receivable minus inventories

Cash = $2,400,000 - $1,096,000 - $1,200,000 = $104,000