

SOLUTIONS MANUAL

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Third Edition

Introduction to Corporate Finance



Graham I Smart
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Chapter 2: Financial Statement and Cash Flow Analysis*Answers to End of Chapter Questions*

- 2-1. Financial statement analysis provides information about the company's financial health, and its strengths and weaknesses. Using standardized GAAP rules does add validity by making comparisons between companies easier.
- 2-2. The Sarbanes-Oxley Act of 2002 (SOX) established the Public Company Accounting Oversight Board (PCAOB), which effectively gives the SEC authority to oversee the accounting profession's activities. Possible shortcomings of relying solely on financial statement analysis include:
- If a company is in multiple lines of business it may be difficult to make comparisons.
 - The accounting data may not be accurate.
 - Average performance may not be a good measure, especially if the industry is in a slump.
 - It is possible to manipulate accounting numbers.
- 2-3. Data on a company's performance over a reporting period: income statement, statement of cash flows, statement of retained earnings (how much additional retained earnings will be added to existing retained earnings). Data about the company's current position: balance sheet. Notes to the financial statements contain details about the composition and cost of the company's debt, any liabilities such as lawsuits that are still pending, revenue recognition, taxes, significant clients, detailed breakdowns of fixed asset accounts, executive compensation, and descriptions of employee benefit plans. An example of a situation in which the notes would be essential to valuation would be a company that relied on a few clients, rather than a wide base of clients. The notes would detail current and expected revenue from those clients and how that revenue would be recognized. An analyst would need this information to develop a set of cash flows for the company which would provide the basis of a company valuation.
- 2-4. An analyst looking at granting a loan request would be most interested in the company's balance sheet, which he or she could use to compute liquidity ratios (current and quick ratios) and debt ratios. A credit analyst would also want an income statement with EBIT and interest in order to compute times interest earned. Times interest earned is a measure of how well a company can pay its interest obligations, while liquidity and debt ratios show what assets are available to repay debt.
- 2-5. The two definitions are different because the new definition will be less than the textbook definition by interest expense*tax rate (*i.e.*, the tax break generated by interest). Should the firm not have any debt, the two definitions are equal because the tax break from debt is zero.
- 2-6. This has a positive effect on free cash flow because $\Delta A/P$ is more likely to be larger than the change in inventory which is a component of ΔCA .
- 2-7. Yes, it is credible that Firm Q takes a large amount of depreciation making its times interest earned ratio relatively low. The gross profit margin ratio is not revealing because gross profit is not affected by depreciation expense.
- 2-8. This has no effect on operating cash flow but has a positive effect on free cash flow.

- 2-9. One would expect the times interest earned ratio to be high, the debt-to-equity ratio to be low, and the equity multiplier to be low.
- 2-10. The DuPont system is useful in breaking down ROE and ROA into its component parts. If ROE is increasing (decreasing), a manager can see if the cause is a higher (lower) profit margin, a higher (lower) asset turnover or a higher (lower) equity multiplier. Then if one of the components is improving (declining) the firm can take steps to pay attention to that area of the business. ROE is equal to ROA times the equity multiplier. It would be possible to raise ROE by choosing to finance the firm more aggressively, even if ROA remained the same.

Solutions to End of Chapter Problems

- 2-1. Answers to parts (a) through (j):
- \$400,000, or \$140,000 in Cash plus \$260,000 in Marketable Securities
 - \$3,780,000
 - \$2,620,000, or \$1,060,000 in current liabilities plus \$1,560,000 in Total long-term debt
 - \$480,000
 - \$6,900,000
 - \$1,610,000, of the sum of the Common stock (at par), Paid-in capital in excess of par and Retained Earnings balances
 - \$600,000
 - \$355,000
 - \$85,800
 - 124,615, or $\$178,200 \div \1.43
- 2-2. Internet exercise
- 2-3. The answers to parts (a) through (d):
- Tax rate = $1,300 / (1,300 + 2,400) = 35.135\%$
NOPAT = EBIT (1-T) = $\$4,500 (1-0.35135) = \$2,919$
 - Operating cash flow (OCF) = NOPAT + depreciation
 $= \$2,919 + \$1,600 = \underline{\$4,519}$
 - Free cash flow (FCF) = OCF - Δ F A - (Δ C A - Δ A/P - Δ accruals)
 $= \$4,519 - (\$31,500 - \$30,100) -$
 $[(\$16,200 - \$14,800) - (\$3,600 - \$3,500) - (\$1,200 - \$1,300)]$
 $= \$4,519 - \$1,400 - [\$1,400 - \$100 - (-\$100)]$
 $= \$4,519 - \$1,400 - \$1,400$
 $= \underline{\$1,719}$
 - Operating cash flow is higher than NOPAT because OCF adds back depreciation (a non-cash expense), which is subtracted when calculating profitability measures such as EBIT and NOPAT. FCF not only looks at operations, but also whether a company has added assets or reduced liabilities (outflows of cash) or reduced assets and increased liabilities (inflows of cash).
- 2-4. Cash + 600 (O)
Accounts payable -1,200 (O)
Notes payable +800 (I)
Long-term debt -2,500 (O)
Inventory + 400 (O)
Fixed assets +600(O)

Accounts receivable -900 (I)
 Net profits +700 (I)
 Depreciation +200 (I)
 Repurchase of stock +500 (O)
 Cash dividends +300 (O)
 Sale of stock +1,300 (I)

2-5. Income Statement for Aluminum Industries

	Common Size %	
Sales	\$30,000,000	100.00%
Less: Cost of goods sold	21,000,000	70.00
Gross Profit	\$ 9,000,000	30.00%
Selling expense	\$ 3,000,000	10.00%
G&A expense	1,800,000	6.00
Lease expense	200,000	0.67
Depreciation	1,000,000	3.33%
Total operating expense	\$ 6,000,000	20.00
Operating Profit	\$ 3,000,000	10.00%
Less: Interest Expense	1,000,000	3.33
Net Profit before taxes	\$ 2,000,000	6.67%
Less: Taxes (rate = 40%)	800,000	2.67
Net Profit after taxes	\$ 1,200,000	4.00%

Sales have declined from \$35 million to \$30 million and cost of goods sold has increased as a percentage of sales (from 65.9% in 2009 to 70% in 2010), probably due to a loss of productive efficiency. Total operating expenses have decreased as a percent of sales (from 23.2% in 2009 to 20.0% in 2010); this appears favorable unless this decline has contributed toward the fall in sales. Interest as a percentage of sales has increased significantly (from 1.5% in 2009 to 3.33% in 2010); this is likely attributable to the firm's relatively high debt levels in 2010. Further analysis should therefore focus on the firm's increased cost of goods sold and its high level of debt. Converting the 2009 common-size income statement to dollar values is helpful in this regard.

Sales	\$35,000,000
Cost of goods sold	23,065,000
Gross Profit	\$11,935,000
Selling expense	\$ 4,445,000
G&A expense	2,205,000
Lease expense	210,000
Depreciation	1,260,000
Total operating expense	\$ 8,120,000
Operating Profits	\$ 3,815,000
Interest Expense	525,000
Net Profit before taxes	\$ 3,290,000
Taxes	1,330,000

Net Profit after taxes	\$ 1,960,000
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- 2-6. Current Ratio = Current Assets/Current Liabilities →
 $CA = \text{Current Ratio} * CL = 2.0 * \$10,000.00 = \$20,000.00$
 Quick Ratio = $(CA - \text{Inventory})/CL$:
 $1.0 = (\$20,000 - \text{Inventory})/\$10,000 \rightarrow$
 $\$10,000 = \$20,000 - \text{Inventory} \rightarrow$
 Inventory = \$10,000
- 2-7. The average age of inventory is 81.11 days $(365 \div 4.5)$, which is added to the average collection period of 90 days to yield 171.11 days. 171.11 days is the time it takes to receive the inventory and then collect payment for selling the inventory on average.
- 2-8. The equity multiplier is 1.5 (*i.e.*, $ROE \div ROA$). Consequently, the debt ratio is
 $1 - 1/(\text{equity multiplier}) = 1 - 1/1.5 = 0.3333$ or $1/3$.
- 2-9. For this problem, it is useful to note that $ROE = ROA \times EM$. The fact that Firm B has the same ROE as Firm A, but only half the ROA, means that its equity multiplier must be twice as large. Since Firm A is entirely equity-financed, its equity multiplier (Assets/Equity) must equal 1. Therefore, Firm B's equity multiplier must be 2, so its debt ratio must be 50% (or 0.5), and its debt-to-equity ratio must be 1.0.
- 2-10. ROA before the reduction in the asset base is 1.2%, or $\$15,000,000 \div \$1,250,000,000$. ROE before the adjustment is $\$15,000,000 \div \$75,000,000$, or 20%. After the adjustment, ROE does not change, as neither earnings nor equity changes. However, ROA increases as the denominator falls. The new ROA would be 1.5%, or $\$15,000,000 \div \$1,000,000,000$.
- 2-11. Total Asset Turnover = $\text{Sales} \div \text{Total Assets} \Rightarrow 2 = \$4,800,000 \div \text{Total Assets} \Rightarrow \text{Total Assets} = \$2,400,000$
- Gross Profit Margin = $\text{Gross Profit} \div \text{Sales} \Rightarrow 0.4 = \text{Gross Profit} \div \$4,800,000 \Rightarrow \text{Gross Profit} = \$1,920,000$
- Cost of Goods Sold (COGS) = $\$4,800,000 - \$1,920,000 = \$2,880,000$
- Inventory Turnover = $\text{COGS} \div \text{Inventory} \Rightarrow 10 = \$2,880,000 \div \text{Inventory} \Rightarrow \text{Inventory} = \$288,000$
- Total Current Assets = $\text{Cash} + \text{Marketable Securities} + \text{Accounts Receivable} + \text{Inventories} =$
 $\$52,000 + \$60,000 + \$200,000 + \$288,000 = \$600,000$
- Total Assets = $\text{Total Current Assets} + \text{Fixed Assets (gross)} - \text{Accumulated Depreciation} \Rightarrow$
 $\$2,400,000 = \$600,000 + \text{Fixed Assets (gross)} - \$240,000 \Rightarrow \text{Fixed Assets (gross)} = \$2,040,000$
- Net Fixed Assets = $\text{Fixed Assets (gross)} - \text{Accumulated Depreciation} \Rightarrow \$2,040,000 - \$240,000 = \$1,800,000$
- EBIT = $\text{Gross Profit} - \text{Total operating expenses} = \$1,920,000 - \$1,560,000 = \$360,000$

$$\text{Current Ratio} = \text{Current Assets} \div \text{Current Liabilities} \Rightarrow 1.6 = \$600,000 \div \text{Current Liabilities} \Rightarrow \\ \text{Current Liabilities} = \$375,000$$

$$\text{Notes Payable} = \text{Total Current Liabilities} - \text{Accounts Payable} - \text{Accruals} = \$375,000 - \$150,000 \\ - \$80,000 = \$145,000$$

$$\text{Total Liabilities} = \text{Long-term debt} + \text{Total Current Liabilities} \Rightarrow \$425,000 + \$375,000 = \\ \$800,000$$

$$\text{Total Equity} = \text{Total Assets} - \text{Total Liabilities} = \$2,400,000 - \$800,000 = \$1,600,000$$

$$\text{Total Liabilities and Stockholders' Equity} = \text{Total Assets} = \$2,400,000$$

$$\text{Net Profit Margin} = \text{Net Income} \div \text{Sales} \Rightarrow 0.0375 = \text{Net Income} \div \$4,800,000 \Rightarrow \text{Net Income} = \\ \$180,000$$

$$\text{EBT} - \text{Taxes} = \text{Net Income} \Rightarrow \$325,000 - \text{Taxes} = \$180,000 \Rightarrow \text{Taxes} = \$145,000$$

$$\text{Earnings Available to Common Stockholders (EACS)} = \text{Net Income} - \text{Preferred Dividend} = \\ \$180,000 - \$15,000 = \$165,000$$

$$\text{To Retained Earnings} = \text{EACS} - \text{Dividend} = \$165,000 - \$60,000 = \$105,000$$

$$\text{Return on Common Equity} = \text{EACS} \div \text{Common Equity} \Rightarrow 0.125 = \$165,000 \div \text{Common Equity} \\ \Rightarrow \text{Common Equity} = \$1,320,000$$

$$\text{Paid-in Capital in excess of par} = \text{Common Equity} - \text{Common Stock (at par)} - \text{Retained Earnings} \\ \Rightarrow \$1,320,000 - \$150,000 - \$390,000 = \$780,000$$

$$\text{Preferred Stock} = \text{Total Stockholders' Equity} - \text{Common Equity} = \$1,600,000 - \$1,320,000 = \\ \$280,000$$

2-12. The ratios for Aluminum Industries are provided in the table below.

Ratio	Definition	Calculation	Aluminum	Industry Avg.
Debt	$\frac{\text{Debt}}{\text{Total Assets}}$	$\frac{\$36,500,000}{\$50,000,000}$	0.73	.51
Debt-Equity	$\frac{\text{Long-Term Debt}}{\text{Equity}}$	$\frac{\$20,000,000}{\$13,500,000}$	1.48	1.07
Times Interest Earned	$\frac{\text{EBIT}}{\text{Interest}}$	$\frac{\$3,000,000}{\$1,000,000}$	3.00	7.30

Because Aluminum Industries, Inc. has a much higher degree of indebtedness and much lower ability to service debt than the average firm in the industry, the loan should be rejected.

2-13. EPS equals \$45 million divided by 27 million shares: \$1.67 EPS. P-to-E multiplied by EPS generates the stock price: $\$1.67 \times 20.0 = \33.33 .

2-14. Balance Sheet Items

Balance Sheet Item	Currently	Debt Financing	Stock Financing
Current Assets	\$250,000	\$250,000	\$250,000
Fixed Assets	750,000	3,750,000	3,750,000
Total Assets	\$1,000,000	\$4,000,000	\$4,000,000
Current Liabilities	\$ 300,000	\$ 300,000	\$ 300,000
Long-Term Debt	0	3,000,000	0
Total Liabilities	\$ 300,000	\$3,300,000	\$ 300,000
Common Equity	\$ 700,000	\$ 700,000	\$3,700,000
Total Liabilities & Equity	\$1,000,000	\$4,000,000	\$4,000,000

Income Statement Items

Sales	\$500,000	\$1,500,000	\$1,500,000
Expenses @ 40%	200,000	600,000	600,000
EBIT	\$300,000	\$ 900,000	900,000
Interest Expense (0.10 × L-T Debt)	0	300,000	0
Net Profit Before Taxes	\$300,000	\$ 600,000	\$ 900,000
Taxes @ 40%	120,000	240,000	360,000
Net Income (NI)	\$180,000	\$ 360,000	\$ 540,000
ROE = NI ÷ Stockholders' Equity	<u>25.71%</u>	<u>51.43%</u>	<u>14.59%</u>

All else remaining the same, Tracey should expand her operations using debt financing because this strategy will double her firm's ROE.

2-15. Answers to parts (a) through (d):

a. $ROE = \text{Net Profit Margin (NPM)} \times \text{Total Asset Turnover (TAT)} \times \text{Equity multiplier (A/E)}$

$$ROE_{HMM} = (\$4,200,000 \div \$75,000,000) \times (\$75,000,000 \div \$100,000,000) \times (\$100,000,000 \div \$40,000,000) = 0.056 \times 0.75 \times 2.50 = 10.5\%$$

$$ROE_{MS} = (\$4,200,000 \div \$50,000,000) \times (\$50,000,000 \div \$80,000,000) \times (\$80,000,000 \div \$30,000,000) = 0.084 \times 0.625 \times 2.67 = 14\%$$

Metallic Stamping (MS) has an ROE of 14% as compared to 10.5% for Heavy Metal (HMM). While Heavy Metal utilizes its assets more efficiently (TAT= 0.75 vs. 0.625 for Metallic Stamping), Metallic converts a greater percentage of sales into net income (NPM = 0.084 vs. 0.056 for Heavy Metal) and makes greater use of financial leverage, given its slightly higher financial leverage multiplier (2.67 vs. 2.50 for Heavy Metal).

- b. $ROE_{HTS} = (\$24,000,000 \div \$100,000,000) \times (\$100,000,000 \div \$100,000,000) \times (\$100,000,000 \div \$00,000,000) = 0.24 \times 1 \times 1.11 = 10.5\%$
- c. Heavy Metal has a lower ROA ($0.056 \times 0.75 = 0.042$ vs. $0.24 \times 1 = 0.24$ for HTS) and a higher financial leverage multiplier (2.50 vs. 1.11 for HTS) than High Tech Software, Inc. Similarly, Metallic Stamping has a lower ROA ($0.084 \times 0.625 = 0.053$ vs. $0.24 \times 1 = 0.24$ for HTS) and a higher financial leverage multiplier (2.67 vs. 1.11 for HTS).
- d. Because the average values of the three ROE components are industry-specific, DuPont analysis across industries is not very meaningful.

2-16. Internet exercise

2-17.

- a. Net Profit Margin = $\$180,000 \div \$4,000,000 = 0.045 = \underline{4.5\%}$

$$\text{Total Asset Turnover} = \$4,000,000 \div \$2,000,000 = \underline{2.00}$$

$$\text{Assets-to-Equity Ratio} = \$2,000,000 \div \$1,000,000 = \underline{2.00}$$

$$\text{Return on Total Assets (ROA)} = \text{Net Profit Margin} \times \text{Total Asset Turnover} = 0.045 \times 2.00 = 0.09 = \underline{9\%}$$

$$\text{Return on Equity (ROE)} = \text{Return on Total Assets} \times \text{Assets-to-Equity Ratio} = 0.09 \times 2.00 = 0.18 = \underline{18\%}$$

b.

Sales	\$6,000,000	Current Assets	\$ 0
Expenses (.90 × \$6,000,000)	5,400,000	Fixed Assets	\$3,000,000
EBIT	\$ 600,000	Total Assets	\$3,000,000
Interest (.10 × \$2,000,000)	200,000		
EBT	\$ 400,000	Current Liabilities	\$ 0
Taxes @ 40%	160,000	Long-Term Debt @ 10%	2,000,000
Net Income	\$ 240,000	Total Liabilities	\$2,000,000
		Common Equity	\$1,000,000
		Total Liab. & S/H Equity	\$3,000,000

$$\text{Net Profit Margin} = \$240,000 \div \$6,000,000 = 0.04 = \underline{4\%}$$

$$\text{Total Asset Turnover} = \$6,000,000 \div \$3,000,000 = \underline{2.00}$$

$$\text{Assets-to-Equity Ratio} = \$3,000,000 \div \$1,000,000 = \underline{3.00}$$

$$\text{Return on Total Assets (ROA)} = 4\% \times 2.00 = \underline{8\%}$$

$$\text{Return on Equity (ROE)} = 8\% \times 3.00 = \underline{24\%}$$

As measured by ROE, which increases from 18% to 24%, the purchase of the assets is a good investment.

c.

Sales	\$4,500,000	Current Assets	\$ 0
Expenses (.90 × \$4,500,000)	4,050,000	Fixed Assets	3,000,000
EBIT	\$ 450,000	Total Assets	<u>\$3,000,000</u>
Interest (.10 × \$2,000,000)	200,000		
EBT	\$ 250,000	Current Liabilities	\$ 0
Taxes @ 40%	100,000	Long-Term Debt	2,000,000
Net Income	<u>\$ 150,000</u>	Total Liabilities	<u>\$2,000,000</u>
		Common Equity	1,000,000
		Total Liab. & S/H Equity	<u>\$3,000,000</u>

$$\text{Net Profit Margin} = \frac{\$150,000}{\$4,500,000} = 0.0333 = 3.33\%$$

$$\text{Total Asset Turnover} = \frac{\$4,500,000}{\$3,000,000} = 1.5$$

$$\text{Assets-to-Equity Ratio} = \frac{\$3,000,000}{\$1,000,000} = 3.00$$

$$\text{Return on Total Assets (ROA)} = 3.33\% \times 1.50 = \underline{5\%}$$

$$\text{Return on Equity (ROE)} = 5\% \times 3.00 = \underline{15\%}$$

In this case, the acquisition of assets lowers ROE (from 18% to 15%) and therefore is not a good investment.

d. The assets-to-equity ratio is not affected by a change in sales, but is affected only by the financing decision. This implies that ROE can be enhanced by an increase in financial leverage only if the assets purchased with the debt are utilized at least as efficiently as existing assets in generating sales and in earning net income on those sales.

2-18. Answers to (a) and (b):

a. Financial Statement Analysis

Access Corporation Ratio Analysis

	Industry Average	Actual 2009	Actual 2010
Current ratio	1.80	1.84	1.04
Quick (acid-test) ratio	0.70	0.78	0.38
Inventory turnover	2.50	2.59	2.33
Average collection period	37 days	36 days	57 days
Average payment period	72 days	78 days	101 days
Debt-to-equity ratio	50%	51%	40%
Times interest earned ratio	3.8	4.0	2.8

Gross profit margin	38 %	40 %	34 %
Net profit margin	3.5%	3.6%	4.1%
Return on total assets (ROA)	4.0%	4.0%	4.4%
Return on common equity (ROE)	9.5%	8.0%	11.3%
Market/book (M/B) ratio	1.1	1.2	1.3

- b (1). **Liquidity:** Access Corporation's liquidity position has deteriorated from 2009 to 2010 and is inferior to the industry average. The firm may not be able to satisfy short-term obligations as they come due.
- b (2). **Activity:** Access' ability to convert assets into cash has deteriorated from 2009 to 2010. Examination into the cause of the 21-day increase in the average collection period is warranted. Inventory turnover has also decreased for the period under review and is OK when compared to the industry. The firm may be holding slightly excessive inventory. The average payment period increased significantly and needs attention; the firm is taking 23 days longer to pay its accounts payable in 2010 than it did in 2009 and its average payment period is well above the industry average.
- b (3). **Debt:** Access' long-term debt position has improved since 2009 and is significantly below the industry average. Access Corp.'s ability to service interest payments has deteriorated and is well below the industry average; it needs attention.
- b (4). **Profitability:** Although the company's gross profit margin is below its industry average, indicating high cost of goods sold, the firm has a superior net profit margin in comparison to the industry average. The firm has lower than average operating expenses. The firm has a superior return on investment and return on equity in comparison to the industry and shows an upward trend.
- b (5). **Market:** The firm's increasing and above-industry-average market/book ratio indicates that investors are willing to pay an increasing and above-industry-average amount for each dollar of book value. Clearly investors have positive expectations of the firm's future success.

Overall, the firm maintains superior profitability at the risk of illiquidity. Investigation into the management of accounts receivable and inventory is warranted. It appears that the firm's significant decline in liquidity may be driven by increasing current liabilities that may have been substituted for long-term debt financing between 2009 and 2010. Regardless, investors appear to feel positively about the firm's future prospects.

2-19. Complete Ratio Analysis

MBA Company Ratio Analysis

Ratio	Actual 2008	Actual 2009	Actual 2010	Industry 2010	Time Series (TS) Cross-Sectional (CS)
Current ratio	1.40	1.55	1.67	1.85	TS: Improving CS: Fair
Quick (acid-test) ratio	1.00	0.92	0.88	1.05	TS: Deteriorating CS: Poor
Inventory turnover	9.52	9.21	7.89	8.60	TS: Deteriorating CS: Fair
Average collection period (in days)	45.0	36.4	29.2	35.0	TS: Improving CS: Good

Average payment period (in days)	58.5	60.8	53.0	45.8	TS: Improving CS: Good
Fixed asset turnover	1.08	1.05	1.11	1.07	TS: Stable CS: Good
Total asset turnover	0.74	0.80	0.83	0.74	TS: Improving CS: Good
Debt ratio	0.20	0.20	0.35	0.30	TS: Increasing CS: Fair
Debt-to-equity ratio	0.25	0.27	0.38	0.39	TS: Increasing CS: Good
Times interest earned ratio	8.2	7.3	6.5	8.0	TS: Deteriorating CS: Poor
Gross profit margin	0.30	0.27	0.25	0.25	TS: Deteriorating CS: Good
Operating profit margin	0.12	0.12	0.13	0.10	TS: Improving CS: Good
Net profit margin	0.067	0.067	0.061	0.058	TS: Stable CS: Good
Return on total assets	0.049	0.054	0.051	0.043	TS: Improving CS: Good
Return on common equity	0.066	0.073	0.090	0.072	TS: Improving CS: Good
Earnings per share	\$1.75	\$2.20	\$3.05	\$1.50	TS: Improving CS: Good
Price/earnings ratio	12.0	10.5	9.0	11.2	TS: Deteriorating CS: Poor
Market/book ratio	1.2	1.05	0.81	1.10	TS: Deteriorating CS: Poor

Liquidity: MBA Company's overall liquidity as reflected by the current ratio and quick ratio appears to have remained relatively stable but both are below the industry average. The quick ratio is particularly poor.

Activity: The activity of accounts receivable has improved, but inventory turnover has deteriorated and is currently below the industry average. It has brought its long payables down, but the average payment period is still above the industry average.

Debt: The firm's debt ratios have increased and are very close to the industry averages, indicating currently acceptable values but an undesirable trend.

Profitability: The firm's gross profit margin, while in line with the industry average, has declined, probably due to higher cost of goods sold. The operating and net profit margins have been relatively stable and are also in the range of the industry averages. Both the return on total assets and return on common equity appear to have improved slightly and are well above the industry averages. Earnings per share made a significant increase in 2009 and 2010.

Market: The price/earnings (P/E) ratio indicates a declining level of investor confidence in the firm's future earnings potential, perhaps due to the firm's increased debt load and higher servicing requirements. The market/book (M/B) ratio also reflects declining and below-industry-average investor confidence in the firm in 2010.

In summary, the firm needs to attend to inventory and should not incur added debts until their leverage and interest coverage ratios are improved. Investor confidence appears to be declining.

Other than these indicators, the firm appears to be doing well—particularly in generating returns on sales.

- 2-19. Answer differs based upon students' choices.
- 2-20. Thomson One Business School Edition Problem
- 2-21. Thomson One Business School Edition Problem

Answer to mini-case:

Financial Statements for 2010:

Jaedan Industries
Income Statement
For the year ending December 31, 2010

Sales	\$42,000,000
Cost of Goods Sold	\$26,460,000
Gross Profit	<u>\$15,540,000</u>
Operating Expenses:	
Selling, General and Administrative	\$1,621,000
Depreciation	<u>\$800,000</u>
Earnings before interest and taxes	\$13,119,000
Interest Expense	<u>\$375,200</u>
Earnings before taxes	\$12,743,800
Taxes	<u>\$4,332,892</u>
Net Income	<u>\$8,410,908</u>
Dividends paid	\$2,102,727
Addition to Retained Earnings	\$6,308,181

Jaedan Industries
Statement of Retained Earnings
For the year ending December 31, 2010

Retained Earnings balance from beginning of year	\$1,628,819
Plus: Net Income for 2010	\$8,410,908
Less: Cash dividends paid during 2010	
Preferred Stock	\$8,000
Common Stock	\$2,102,727
Total dividends paid	<u>\$2,110,727</u>
Retained earnings balance (December 31, 2010)	<u>\$7,929,000</u>

Jaedan Industries
Balance Sheet
December 31, 2010

Assets	
Cash	\$3,689,000
Marketable Securities	\$1,836,000
Accounts Receivable	\$5,423,000
Inventory	<u>\$4,118,000</u>
Total Current Assets	\$15,066,000
Fixed Assets	\$14,811,000
Less: Accumulated Depreciation	<u>\$5,960,000</u>
Net Fixed Assets	<u>\$8,851,000</u>
Total Assets	<u>\$23,917,000</u>

Liabilities and Equity	
Accounts Payable	\$3,136,000
Notes Payable	\$706,000
Accruals	\$500,000
Total Current Liabilities	\$4,342,000
Long-Term Bonds	\$3,046,000
Preferred Stock	\$100,000
Common Stock (at par)	\$4,000,000
Paid-in capital in excess of par	\$4,500,000
Retained Earnings	\$7,929,000
Total Liabilities and Equity	\$23,917,000

Jaedan Industries
Statement of Cash Flows
For the year ended December 31, 2010

Cash flow from operating activities:	
Net income	\$8,410,908
Depreciation	\$800,000
Increase in Accounts Receivable	(\$2,555,500)
Increase in Inventory	(\$908,000)
Increase in Accounts Payable	\$190,000
Increase in Accruals	\$150,000
Cash provided by operating activities	\$6,087,408
Cash flow from investment activities	
Increase in gross fixed assets	(\$2,932,000)
Cash provided (consumed) by investing activities	(\$2,932,000)
Cash flow from financing activities	
Increase in notes payable	\$22,000
Dividends paid:	
Preferred	(\$8,000)
Common	(\$2,102,727)
Cash provided by financing activities	(\$2,088,727)
Net increase in cash and marketable securities	\$ 1,066,681.00

Free Cash Flow:

$$\text{OCF} = [\$13,119,000 \times (1 - 0.34)] + \$800,000 = \$9,458,540$$

$$\text{Change in Fixed Assets} = \$2,932,000$$

$$\text{Change in Current assets} = \$4,530,181$$

$$\text{Change in Accounts Payable} = \$190,000$$

$$\text{Change in Accruals} = \$150,000$$

$$\text{FCF} = \$9,458,540 - \$2,932,000 - (\$4,530,181 - \$190,000 - \$150,000) = \$2,336,359$$

Ratios:

	Jaedan		Industry	
	2009	2010	2009	2010
Liquidity Ratios				
Current Ratio	2.65	3.47	2.89	3.26
Quick Ratio	1.84	2.52	1.42	2.19
Activity Ratios				
Inventory Turnover	8.41	6.43	6.71	6.59
Average Collection Period	27.13	47.13	35.12	36.17
Average Payment Period	53.09	57.68	50.73	49.63
Fixed Asset Turnover	5.74	4.75	4.32	4.76
Total Asset Turnover	2.24	1.76	2.14	2.33
Debt Ratios				
Debt Ratio	40.72%	30.89%	41.93%	39.36%
Assets-to-equity	170.35%	145.58%	165.82%	163.13%
Debt-to-equity	29.78%	18.43%	31.26%	30.23%
Times Interest Earned	26.33	34.97	15.72	16.81
Profitability Ratios				
Gross Profit Margin	30.00%	37.00%	22.19%	23.74%
Operating Profit Margin	25.59%	31.24%	19.32%	20.89%
Net Profit Margin	16.25%	20.03%	15.11%	17.97%
Earnings per share	\$6.27	\$8.41	\$4.36	\$4.58
Return on total assets	36.29%	35.13%	32.34%	41.87%
Return on common equity	61.81%	51.15%	53.63%	68.30%
Market Ratios				
Price/Earnings ratio	6.84	6.76	5.41	5.97
Market/book ratio	4.23	3.46	4.19	4.32

Analysis of Financial Ratios:

Liquidity Ratios: Jaedan has improved its Current Ratio to above the industry average from 2009 to 2010. Its Quick Ratio is a fair bit higher than the industry average. While it is possible to have liquidity ratios that are “too” high, suggesting that the firm should consider investing more in long-term assets, Jaedan does not appear to be in this situation.

Activity Ratios: Jaedan’s Inventory Turnover was substantially higher than the Industry in 2009 but it is now slightly lower than the industry average. This suggests that it is now keeping its inventory for few days more each year and it is more in line with the industry at this point. One serious problem for Jaedan is its Average Collection Period (ACP). The firm has not changed its terms of trade that it is offering its customers; however, its ACP has almost doubled. It is now substantially above the 35 days that it allows its customer before payment is due and is considerably higher than the industry average. Perhaps the firm has lowered its credit standards. At any rate, Jaedan should work on improving this situation. Additionally, Jaedan is now taking longer to pay its suppliers as the Average Payment Period has increased by approximately 4.5 days. Jaedan’s suppliers offer Jaedan 45 days to pay its Accounts Payable—on average Jaedan is taking almost two weeks longer than that to pay (in 2010). This may have already resulted in a lower credit rating for the company. With respect to the turnover ratios, Jaedan has experienced a reduction. This is due, in part to the fact that Fixed Assets increased by almost \$3,000,000 to handle the increase in sales. Regardless, each dollar invested in an asset is not generating as much in revenue in 2010 as it was in 2009. Jaedan is now below the industry average for 2010.

Debt Ratios: Jaedan's Debt Ratio has decreased significantly from 2009's value; however, this is not due to the fact that the firm has significantly reduced its debt, but rather to the fact that the firm's Total Assets are substantially higher. As shown on the Statement of Cash Flows, we can see that the bulk of the firm's investment in Fixed Assets was financed with proceeds from operations rather than from financing activities. The firm's Assets-to-Equity ratio has dropped a great deal, because the firm has experienced a larger rate of growth in its Retained Earnings (due to a large Net Profit Margin and the same retention rate) than in its Total Assets. Debt-to-equity has dropped substantially from 2009 due mainly to the increase in equity from Retained Earnings. Times Interest Earned has increased due to the increased EBIT coupled with the almost negligible change in Interest Expense from 2009 to 2010. Generally speaking, Jaedan Industries is in a better position with debt ratios than the industry.

Profitability Ratios: With respect to all three profit margins, Jaedan has improved in 2010 over 2009, as has the industry. Jaedan is consistently outperforming the industry in converting its sales dollars to profit. The firm's EPS has experienced a hefty increase, again due to the large increase in Net Income. Return on total assets has decreased slightly because the increase in Net Income was not as large as the increase in Total Assets. The same situation applies to Jaedan's Return on Common Equity. The opposite has occurred with the Industry.

Market Ratios: Jaedan's stock price has risen from \$42.89 to \$56.82 from 2009 to 2010. However, both Jaedan's P/E ratio and Market/Book ratio have dropped. This suggests that the market is not willing to pay as high of a multiple over earnings or book value as they have been willing to pay in the past. Jaedan is still higher than the industry with respect to the P/E ratio but it is now lower than the industry with respect to Market/book value.

DuPont Analysis: DuPont analysis allows us the ability to isolate why the firm's Return on Assets (ROA) changed. In Jaedan's case, ROA dropped from 36.29% to 35.13% from 2009 to 2010. As you can see from the calculations below, this is due to the lower Total Asset Turnover (TATO), as the firm's Net Profit Margin (NPM) actually increased.

$$\text{ROA} = \text{NPM} \times \text{TATO}$$

$$2009: 0.1625 \times 2.24 = 36.4\%$$

$$2010: 0.2003 \times 1.76 = 35.25\%$$

DuPont analysis also lets us determine why the firm's Return on Equity (ROE) changed. Jaedan's ROE dropped from 61.81% to 51.15%. This change was mainly due to the lower assets-to-equity ratio. The firm's maintenance of approximately the same level of debt to the absolute increase in equity in a period of increasing profitability has resulted in lower ROE.

$$\text{ROE} = \text{ROA} \times \text{A/E}$$

$$2009: 0.3629 \times 1.7035 = 61.82\%$$

$$2010: 0.3513 \times 1.4558 = 51.14\%$$