

FINANCIAL STATEMENT ANALYSIS/RATIOS: PROBLEM SET

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This problem set covers all of our ratio analysis situations, with a general increase in degree of difficulty as we progress. Be sure that you have mastered the easier problems before moving ahead, because the more difficult examples tend to expand on the ideas presented in the easier ones. The last four problems are comprehensive, involving the interpretation of financial ratios that you compute or are given.

1. Compute Aurora Amalgamated Airways' current ratio and quick ratio, based on its most recent balance sheet:

Cash	\$ 700,000	Accounts Payable	\$ 1,200,000
Marketable Securities	950,000	Notes Payable	2,500,000
Accounts Receivable	1,250,000	Long-Term Debt	1,600,000
Inventory	3,400,000	Paid-In Capital	4,250,000
Net Fixed Assets	<u>6,550,000</u>	Retained Earnings	<u>3,300,000</u>
Total Assets	<u>\$12,850,000</u>	Total Claims	<u>\$12,850,000</u>

2. Compute Belleville Building & Bulldozing's current ratio and quick ratio, and the amount of net working capital, based on its most recent balance sheet:

Cash	\$ 225,000	Accounts Payable	\$ 750,000
Marketable Securities	300,000	Notes Payable	830,000
Accounts Receivable	575,000	Accrued Wages and Taxes	<u>360,000</u>
Inventory	<u>1,550,000</u>	Total Current Liabilities	\$1,940,000
Total Current Assets	\$2,650,000		
		Long-Term Debt	2,500,000
Net Fixed Assets	<u>4,875,000</u>	Paid-In Capital	2,000,000
		Retained Earnings	<u>1,085,000</u>
Total Assets	<u>\$7,525,000</u>	Total Claims	<u>\$7,525,000</u>

3. The most recently compiled balance sheet for Canton Cosmetics Corporation shows \$559,475,000 in total assets, consisting of \$313,306,000 in net fixed assets, \$159,850,000 in inventory, and \$70,437,500 in accounts receivable (along with \$15,881,500 in cash & marketable securities). The most recently compiled income statement shows the year's total sales revenue to have been \$391,632,500. What are the indicated total asset turnover, fixed asset turnover, inventory turnover, and receivable turnover ratios? How many days did it take, on average, for the company's customers to pay for their purchases from Canton (*i.e.*, compute the days' sales in receivables ratio)?

4. The most recently compiled income statement for Decatur Digital Dynamics shows \$684,000 in earnings before interest and taxes (EBIT) and \$106,875 in interest paid. The company's most recent balance sheet shows total assets of \$2,878,000, paid for with \$1,280,710 in debt (liabilities) financing and \$1,597,290 in stockholders' equity. What are the indicated values for the times interest earned ratio, debt ratio, debt/equity ratio, and equity multiplier?

5. The most recently compiled income statement for Effingham Electronic Enterprises shows \$11,635,000 in sales; \$1,287,500 in earnings before interest and taxes (EBIT); and \$616,655 in net income. (The company paid income tax at a 26% average combined federal-plus-state rate.) The most recently assembled balance sheet shows total assets of \$7,420,000; part has been paid for with \$4,180,000 in owners' equity financing (and the remaining \$3,240,000 with borrowed money, or debt). What are the indicated profit margin, return on assets (ROA), return on equity (ROE), and return on invested capital (ROIC) values? If it costs Effingham 10.75% per year, on average, to provide fair financial returns to the lenders and owners who paid for the assets, what is Economic Value Added (EVA)?

6. The most recently compiled balance sheet for Freeport Fine Furniture shows \$10,350,000 in total assets, paid for with \$3,560,400 in debt financing; while the most recently compiled annual income statement shows \$9,000,000 in sales, \$1,600,000 in earnings before interest and taxes (EBIT), and \$844,800 in net income. (The company paid income tax at a 28% average combined state + federal rate.) What are the indicated profit margin, return on assets (ROA), return on equity (ROE), and return on invested capital (ROIC) values?

7. The most recently computed balance sheet for Galesburg Glasswork Galleries is as follows:

Cash & Mkt. Securities	\$ 89,000	Accounts Payable	\$ 113,000
Accounts Receivable	130,000	Notes Payable	250,000
Inventory	448,000	Long-Term Debt	565,000
Net Fixed Assets	<u>1,550,000</u>	Stockholders' Equity	<u>1,289,000</u>
Total Assets	<u>\$2,217,000</u>	Total Claims	<u>\$2,217,000</u>

Compute the group of ratios (from among those we work with in class) that are based only on balance sheet figures. Why do we have to exercise caution in interpreting ratios that reflect only balance sheet information?

8. The most recently computed income statement for Harrisburg Handyman's Hardware is as follows:

Sales	\$12,200,000
Cost of Goods Sold (including Depreciation)	<u>10,130,000</u>
Earnings Before Interest and Taxes (EBIT)	\$ 2,070,000
Interest Expense	<u>661,800</u>
Earnings Before Taxes (EBT)	\$ 1,408,200
Income Taxes	<u>380,200</u>
Net Income	<u>\$ 1,028,000</u>

Compute the group of ratios (from among those we work with in class) that are based only on income statement figures. If there are 1,285,000 shares of common stock, what are earnings per share (EPS)? Why might ratios based on the income statement be less subject to interpretation problems than are balance sheet-based ratios?

9. The most recently computed balance sheet and income statement for Illiopolis Incorporated Industries are:

Cash & Mkt. Securities	\$ 4,875,000	Accounts Payable	\$ 1,972,000
Accounts Receivable	5,250,000	Notes Payable	3,225,000
Inventory	8,760,000	Long-Term Debt	9,640,000
Net Fixed Assets	<u>15,220,000</u>	Stockholders' Equity	<u>19,268,000</u>
Total Assets	<u>\$34,105,000</u>	Total Claims	<u>\$34,105,000</u>

Sales	\$49,560,000
Cost of Goods Sold (including Depreciation)	<u>44,380,000</u>
Earnings Before Interest and Taxes	\$ 5,180,000
Interest Expense	<u>1,376,000</u>
Earnings Before Taxes	\$ 3,804,000
Income Taxes (24%)	<u>913,000</u>
Net Income	<u>\$ 2,891,000</u>

Compute the group of ratios (from among those we work with in class) that are based on both balance sheet and income statement figures. What do such ratios tell us? Why do we have to exercise some caution in interpreting these ratios? If it costs the firm 9.5% per year, on average, to provide fair financial returns to the lenders and owners who have paid for the Illiopolis asset base, what is the company's Economic Value Added (EVA)?

10. Based on its most recently computed financial statements, Jacksonville Jellies & Jams has a receivable turnover ratio of 7.3. If annual sales shown on the company's most recent income statement are \$38,142,500, what level of accounts receivable is shown on Jacksonville's most recent balance sheet? What is days' sales in receivables?
11. The debt ratio (also called total debt ratio or debt to assets ratio) for Kankakee Kitchen Kettles, based on the most recently compiled balance sheet, is 44.3%. If the firm pays for all of its assets with debt and common equity money, what is its debt/equity ratio? Its equity multiplier?
12. The debt/equity ratio for Libertyville Laminates, Ltd. based on the most recently compiled balance sheet, is 92%. What are the corresponding debt ratio and equity multiplier? If Libertyville's return on assets (ROA) is 8.62%, and total stockholders' equity is \$6,207,000, what is the company's return on equity (ROE)? What are the net income and total asset figures shown on the most recent financial statements?
13. The equity multiplier for Metropolis Motorcycle Manufacturing, based on the most recently compiled financial statements, is 1.481. If the company has a 6.25% profit margin and a 1.985 total asset turnover, what is its return on equity (ROE)? What are the company's debt ratio (also called total debt ratio) and debt/equity ratio?
14. The return on equity (ROE) for Naperville Natural Nutrients, based on the most recently compiled financial statements, is 12.7%. The income statement shows sales of \$3,835,000, while the balance sheet shows \$3,250,000 in total assets, \$564,000 in current liabilities, and \$833,500 in long term debt. Compute Naperville's debt ratio, equity multiplier, return on assets (ROA), total asset turnover, and profit margin, along with the net income level we would expect to see on the income statement.
15. Ottawa Ophthalmological Optics has a current ratio, as computed from the company's most recent balance sheet, of 1.85, while the corresponding quick ratio is .975. If that most recent balance sheet shows \$8,930,000 in total current liabilities, what are the total current asset and inventory figures?
16. Managers at Peoria Paper & Packaging fear they are missing sales opportunities because of stock-outs. They want to buy additional inventory, which they will pay for by increasing accounts payable (borrowing from their suppliers). The most recent balance sheet shows \$1,867,500 in current liabilities and \$3,943,750 in current assets, \$1,162,500 of which is inventory. What current and quick ratios are indicated by those values? If Peoria wants to maintain a current ratio of at least the 1.75 industry average, how much new inventory can it buy? Will the purchase leave Peoria in good standing with its bank, which requires it to have a quick ratio of at least 1.0?
17. Compute the times interest earned (TIE) ratio for Quincy Quality Equipment, whose most recent annual income statement shows a 6.3% profit margin on sales of \$11,500,000. The most recent balance sheet shows \$8,560,000 in total assets, of which \$5,258,000 was paid for with owners' (equity) money. Quincy pays an 8.8% average annual interest rate on its total debt financing, and a 28% combined average state-plus-federal income tax rate.
18. Rockford Rotary Razors' most recent income statement showed \$4,895,000 in sales, \$2,791,000 in cash-based cost of goods sold, and \$970,000 in depreciation expense. Dividends paid to the company's common stockholders totaled \$230,630 in the most recent year. The most recent balance sheet showed \$3,360,000 in accumulated retained earnings, while the previous year's figure was \$3,139,970. If Rockford pays income tax at a 26% combined state-plus-federal rate, what is its times interest earned (TIE) ratio ?
19. The total asset turnover, return on assets (ROA), and return on equity (ROE) for Springfield Spring & Sprocket, based on its most recent financial statements, are 2.13 times, 9.9045%, and 23.57%, respectively. What are the company's profit margin and debt ratio? Base your analysis on the DuPont equation.

20. The most recent annual income statement for Taylorville Tachometric Tools shows \$71,600,000 in sales and \$9,100,675 in EBIT. The most recent balance sheet shows \$61,196,600 in total assets, financed in part with \$33,705,000 in debt financing, on which the company pays a 7.5% annual interest rate. Taylorville pays income tax at a 27% combined average state-plus-federal rate. Using the DuPont equation, compute the company's profit margin, total asset turnover, return on assets (ROA), and return on equity (ROE). What would Taylorville's return on invested capital (ROIC) be?

21. After analyzing the most recent financial statements for Urbana United Utilities, you have computed a 6.5% profit margin, a 47.06% debt/equity ratio, and a 12.24% return on equity (ROE). If total assets were \$6,300,000, what were the sales and net income figures shown on the most recent income statement, and the stockholders' equity figure shown on the most recent balance sheet?

22. Vernon Hills Vulcanized Valves' most recently compiled income statement shows a 5.8% profit margin on sales of \$27,766,500. If you have computed the company's total asset turnover to be 1.07, what were total assets? If assets were to remain at that level, how much would sales have to increase to raise the total asset turnover to 1.3 ?

23. Waukegan Waterproofing & Weatherseal operates with \$4,822,069 in total assets, all of which has been paid for with stockholders' equity (there is no debt financing at this time). The company has an annual return on invested capital (ROIC), based on the most recently computed financial statements, of 11.6%, and it pays a 24% average state plus federal combined annual income tax rate. What is Waukegan's return on equity (ROE) under its current financing arrangement? What would ROE be if the company moved to a debt ratio of 30% (at which it would pay a 10% annual interest rate) or 60% (with a 16% annual interest rate)?

24. Financial analysts are forecasting some key ratios for the first year of newly-formed Exeter Executive X-Rays' operations. The planned capital structure is 49% debt, 51% equity (49% of Exeter's assets are to be paid for with debt financing; 51% with equity financing). Sales are expected to be \$21,250,000, with cost of goods sold of \$20,000,000 and a total asset turnover of 3.4. Exeter is expected to pay a 10.2% annual interest rate on borrowed money, and its combined federal-plus-state average income tax rate is expected to be 28%. What should the analysts expect Exeter's first-year times interest earned (TIE), return on assets (ROA), return on equity (ROE), return on invested capital (ROIC), and economic value added (EVA) to be?

25. Analysts examining Yorkville Yacht Yard's most recent financial statements have computed a quick ratio of .79, current ratio of 1.94, and receivable turnover of 6.8 times. The balance sheet shows \$14,000,000 in total assets (\$1,160,000 of which is cash & marketable securities) and \$3,420,000 in current liabilities. Compute Yorkville's annual sales, total asset turnover, fixed asset turnover, and inventory turnover.

26. The following figures were taken, or computed, from Zion Zinc & Zirconium's most recent financial statements:

Accrued Wages & Taxes	\$2,140,000	Quick Ratio	1.25
Long Term Debt	\$3,000,000	Total Asset Turnover	1.85
Paid-In Capital	\$6,000,000	Inventory Turnover	7.85
Total Assets	\$15,875,000	Receivable Turnover	12.15
Avg. Income Tax Rate	27.5%	Debt/Equity Ratio	88.7%
Times Interest Earned	3.6	Profit Margin	5.2%

Use this information to recreate Zion's balance sheet and income statement. Treat cash and marketable securities as one combined account, and treat accounts and notes payable as one combined account. There is no separate paid-in capital in excess of par value; paid-in capital consists of a single account (could be called "common stock" since the company is a corporation).

27. The most recent balance sheet and income statement for Illinois Industrial Imports are as follows:

Cash	\$ 101,000	Accounts Payable	\$ 1,350,000
Marketable Securities	130,000	Notes Payable	650,000
Accounts Receivable	810,000	Accrued Wages & Taxes	<u>300,000</u>
Inventory	<u>4,820,000</u>	Total Current Liabilities	\$ 2,300,000
Total Current Assets	\$ 5,861,000		
		Long-Term Debt	<u>\$11,380,000</u>
		Total Debt	\$13,680,000
Gross Plant & Equipment	\$38,830,000	Paid-In Capital (Common Stock)	\$ 1,000,000
Less Accum. Depreciation	<u>17,180,000</u>	Paid-in Capital in Excess of Par	10,000,000
Net Plant & Equipment	\$21,650,000	Retained Earnings	<u>2,831,000</u>
		Total Stockholders' Equity	\$13,831,000
Total Assets	<u>\$27,511,000</u>	Total Claims	<u>\$27,511,000</u>

Sales	\$35,571,480
Cost of Goods Sold	25,145,400
Depreciation	<u>5,080,000</u>
Earnings Before Interest & Taxes (EBIT)	\$ 5,346,080
Interest paid	<u>1,422,720</u>
Earnings Before Taxes (EBT)	\$ 3,923,360
Income Tax (28%)	<u>1,098,541</u>
Net Income	\$ <u>2,824,819</u>

Industry average figures for some key ratios are as follows:

Current ratio	2.040	Debt ratio	.499
Quick ratio	.544	Debt/equity ratio	.997
Receivable turnover	43.867	Equity multiplier	1.997
Inventory turnover	10.797	Profit margin	.076
Fixed asset turnover	1.641	Return on assets (ROA)	.104
Total asset turnover	1.359	Return on equity (ROE)	.207
Times interest earned	3.735	Return on invested capital (ROIC)	.142

Compute the relevant ratios for Illinois (include the DuPont breakdown), and comment on the company's strengths and weaknesses.

28. The most recent balance sheet and income statement for Land of Lincoln Landscaping are as follows:

Cash & Mkt. Securities	\$ 5,780,000	Accounts Payable	\$ 2,875,000
Accounts Receivable	8,500,000	Notes Payable	5,650,000
Inventory	<u>10,852,000</u>	Accrued Wages & Taxes	<u>478,000</u>
Total Current Assets	\$25,132,000	Total Current Liabilities	\$ 9,003,000
Net Plant & Equipment	\$29,850,000	Long-Term Debt	\$11,750,000
		Total Stockholders' Equity	\$34,229,000
Total Assets	<u>\$54,982,000</u>	Total Claims	<u>\$54,982,000</u>

Sales	\$43,000,000
Cost of Goods Sold (including Depreciation)	<u>34,300,000</u>
Earnings Before Interest & Taxes (EBIT)	\$ 8,700,000
Interest paid	<u>2,158,312</u>
Earnings Before Taxes (EBT)	\$ 6,541,688
Income Tax (27%)	<u>1,766,256</u>
Net Income	\$ <u>4,775,432</u>

Industry average figures for some key ratios are as follows:

Current ratio	2.314	Debt ratio	.343
Quick ratio	1.558	Debt/equity ratio	.522
Receivable turnover	4.882	Equity multiplier	1.522
Inventory turnover	6.579	Profit margin	.103
Fixed asset turnover	1.520	Return on assets (ROA)	.092
Total asset turnover	.890	Return on equity (ROE)	.140
Times interest earned	4.576	Return on invested capital (ROIC)	.118

Compute the relevant ratios for Land of Lincoln (include the DuPont breakdown), and comment on its strengths and weaknesses.

29. Some key ratios computed from Prairie State Precision Pencils' most recent year's financial statements, and the corresponding average ratios for Prairie State's industry, are as follows. What inferences can we draw regarding Prairie State's recent financial performance?

<u>Ratio</u>	<u>Prairie State</u>	<u>Industry Average</u>
Current Ratio	2.255	2.243
Quick Ratio	1.459	1.257
Receivable Turnover	8.525	8.469
Inventory Turnover	7.927	6.311
Fixed Asset Turnover	1.970	1.961
Total Asset Turnover	1.156	1.149
Times Interest Earned	6.522	6.286
Debt Ratio	.409	.406
Debt/Equity Ratio	.692	.682
Equity Multiplier	1.692	1.682
Profit Margin	.100	.132
Return on Assets	.115	.152
Return on Equity	.195	.255
Return on Invested Capital	.136	.180

30. 21st State Stainless Steel was long viewed as the strongest company in its industry. However, over the past year it has been plagued by complaints from customers, investors, and suppliers; and both its managers and some outside analysts are trying to understand what has gone wrong. What seems to have happened to 21st State?

<u>Ratio</u>	<u>Most Recent Year</u>	<u>Prior Year</u>
Current Ratio	1.986	2.222
Quick Ratio	1.000	1.111
Receivable Turnover	7.447	8.000
Inventory Turnover	5.000	5.333
Fixed Asset Turnover	1.989	2.000
Total Asset Turnover	1.104	1.143
Times Interest Earned	3.067	3.846
Debt Ratio	.514	.464
Debt/Equity Ratio	1.058	.867
Equity Multiplier	2.058	1.867
Profit Margin	.054	.065
Return on Assets	.060	.074
Return on Equity	.123	.138
Return on Invested Capital	.088	.100

31. Mississippi-Ohio-Wabash (MOW) Lawn Products' income statement and balance sheet for the year just ended are as follows:

Income Statement: For Most Recent Year (\$ thousands)

Sales	\$8,850
Cost of Producing & Distributing Goods	<u>6,372</u>
Operating Income	\$2,478
Minus Interest	<u>885</u>
Taxable Income	\$1,593
Minus Income Tax (26% average rate)	<u>414</u>
Net Income	<u>\$1,179</u>

Dividends Paid	\$ 602
Earnings Retained	\$ 577

Balance Sheet: As of End of Most Recent Year (\$ thousands)

Cash & Marketable Securities	\$ 708
Accounts Receivable	1,062
Inventory	2,124
Net Fixed Assets (plant & equipment)	<u>5,487</u>
Total Assets	<u>\$9,381</u>

Accounts Payable & Accruals	\$1,416
Notes Payable	1,200
Long-term Debt	2,000
Paid-In Capital	4,000
Retained Earnings	<u>765</u>
Total Claims	<u>\$9,381</u>

Sales in the coming year are forecast to be \$10,089. Use the percentage of sales approach to compute additional (or external) financing needed (called AFN or EFN). Assume that all costs, all assets, and accounts payable & accruals vary directly with sales. Also assume that the average income tax rate and the dividend payout ratio (the proportion of income paid to common stockholders as dividends) are expected to be the same each year.