FINANCIAL RATIO ANALYSIS: PUTTING THE NUMBERS TO WORK

By John Bajkowski

Financial ratio analysis uses historical financial statements to quantify data that will help give investors a feel for a firm's attractiveness based on factors such as its competitive position, financial strength and profitability.

Financial statement analysis consists of applying analytical tools and techniques to financial statements in an attempt to quantify the operating and financial conditions of a firm. The emphasis of the analysis changes depending upon one's relationship with the company. A credit analyst extending a short-term, unsecured loan to a company will examine the firm's cash flow and the liquidity of the company's assets. A stock investor, on the other hand, is primarily looking for future growth in cash flow and earnings. Investors typically examine variables that might significantly impact a firm's financial structure, sales, earnings production, and dividend policy.

Having examined the structure and basic interpretation of the balance sheet, income statement, and statement of cash flows in the first three parts of this series on financial statement analysis, we come to the central issue of how the data can be used in investment analysis. [Note: All of the articles from this series can be found on the AAII Web site in the section titled "Focus on Financial Statements" in the stocks area of our Web site (www.aaii.com/stocks)].

This article will consider financial ratio construction and interpretation with a focus on ratios grouped into operating performance and liquidity and financial risk categories. The financial data used to illustrate the ratios will be taken from the balance sheet and income statements developed previously in this series (See Figures 1 & 2).

RATIO ANALYSIS

Ratios are one of the most popular financial analysis tools. A ratio expresses a mathematical relationship between two items. To be useful comparisons, however, the two values must be related in some way. We have selected some widely used ratios that should be of interest to investors. As with all ratios, a comparison with other firms in similar industries is useful, and a comparison of these ratios for the same firm from period to period is important in pinpointing trends and changes. It is also important to keep in mind that these ratios are interrelated and should be examined together rather than independently.

OPERATING PERFORMANCE

Operating performance ratios are usually grouped into asset management (efficiency) ratios and profitability ratios. Asset management ratios examine how well the firm's assets are being used and managed, while profitability ratios summarize earnings performance relative to sales or investment. Both of these categories attempt to measure management's abilities and the company's accomplishments.

ASSET MANAGEMENT

Total asset turnover measures how well the company's assets have gener-

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FIGURE 1. THE BALANCE SHEET: AN EXAMPLE

Assets		
Current Assets		
Cash		$ 320
Accounts receivable	1,070	
Less: allowance for doubtful accounts	90	
Net accounts receivable		980
Inventory		1,400
Prepaid expenses		100
Total Current Assets		2,800
Investments		350
Property, Plant and Equipment		
Land, buildings, machines, equipment, and furniture	930	
Less: accumulated depreciation	230	
Net property, plant & equipment		700
Other Assets		
Goodwill		300
Total Assets		4,150

Liabilities and Stockholder's Equity	
Current Liabilities	
Accounts payable	$ 540
Accrued expenses	230
Income tax payable	60
Notes payable	170
Current portion of long-term debt	100
Total Current Liabilities	1,100
Long-Term Liabilities	
Deferred income tax	150
Long-term debt	1,000
Total Liabilities	**2,250**
Stockholder's equity	
Preferred Stock	200
Common stock	600
Paid in capital	800
Retained earnings	300
Total Stockholder's Equity	1,900
Total Liabilities and Stockholder's Equity	4,150

ated sales. Industries differ dramatically in asset turnover, so comparison to firms in similar industries is crucial. Too high a ratio relative to other firms may indicate insufficient assets for future growth and sales generation, while too low an asset turnover figure points to redundant or low productivity assets.

Whenever the level of a given asset group changes significantly during the analysis, it may help the analysis to compute the average level over the period. This can be calculated by adding the asset level at the beginning of the period to the level at the end of the period and dividing by two, or in the case of an annual figure, averaging the quarter-end periods.

Inventory turnover is similar in concept and interpretation to total asset turnover, but examines inventory. We have used cost of goods sold rather than revenues because cost of goods sold and inventory are both recorded at cost. If using published industry ratios for company comparisons, make sure that the figures are computed using the same method. Some services may use sales instead of cost of goods sold. Inventory turnover approximates the number of times inventory is used up and replenished during the year. A higher ratio indicates that inventory does not languish in warehouses or on the shelves. Like total asset turnover, inventory turnover is very industry specific. For example, supermarket chains will have a higher turnover ratio than jewelry store chains.

Receivables turnover measures the effectiveness of the firm's credit policies and helps to indicate the level of investment in receivables needed to maintain the firm's level of sales. The receivables turnover tells us how many times each period the company collects (turns into cash) its accounts receivable. The higher the turnover, the shorter the time between the typical sale and cash collection. A decreasing figure over time is a red flag.

Seasonality may affect the ratio if the period ends at a time of year when accounts receivable are normally high. Experts advocate using an average of the month-ending figures to better gauge the level over the course of the year and produce a figure more comparable to other firms. When averaging receivables, most investors will have to rely on quarter-ending figures to calculate average accounts receivable.

Average collection period converts the receivables turnover ratio into a more intuitive unit—days. The ratio indicates the average number of days receivable are outstanding before they are collected. Note that a very high number is not good and a very

low number may point to a credit policy that is too restrictive, leading to lost sales opportunities. Meaningful industry comparisons and an understanding of credit sales policy of the firm are critical when examining these figures.

PROFITABILITY

Long-term investors buy shares of a company with the expectation that the company will produce a growing future stream of cash or earnings even when investing in emerging industries such as the Internet sector. Profits point to the company's long-term growth and staying power. There are a number of interrelated ratios that help to measure the profitability of a firm.

Gross profit margin reflects the firm's basic pricing decisions and its material costs. The greater the margin and the more stable the margin over time, the greater the company's expected profitability. Trends should be closely followed because they generally signal changes in market competition.

Operating profit margin examines the relationship between sales and management-controllable costs before interest, taxes, and non-operational expenses. As with the gross profit margin, one is looking for a high, stable margin.

Profit margin is the "bottom line" margin frequently quoted for companies. It indicates how well management has been able to turn revenues into earnings available for shareholders. For our example, about 4½ cents out of every dollar in sales flows into profits for the shareholder.

Industry comparisons are critical for all of the profitability ratios. Margins vary from industry to industry. A high margin relative to an industry norm may point to a company with a competitive advantage over its competitors. The advantage may range from patent protection to a highly efficient operation operating near capacity.

Return on total assets examines the return generated by the assets of the firm. A high return implies the assets are productive and well-managed.

Return on stockholder's equity (ROE) takes this examination one step further and examines the financial structure of the firm and its impact on earnings. Return on stockholder's equity indicates how much the stockholders earned for their investment in the company. The level of debt (financial leverage) on the balance sheet has a large impact on this ratio. Debt magnifies the impact of earnings on ROE during both good and bad years. When large differences between return on total assets and ROE exist, an investor should closely examine the liquidity and financial risk ratios.

LIQUIDITY

Liquidity ratios examine how easily the firm could meet its short-term obligations, while financial risk ratios examine a company's ability to meet all liability obligations and the impact of these liabilities on the balance sheet structure.

The *current ratio*

FIGURE 2. THE INCOME STATEMENT

Net Sales Revenue	$8,500
Less Cost of Goods Sold	5,600
Gross Income	2,900
Operating Expenses	
Selling, Administrative and General	1,600
Research and Development	450
Depreciation	80
Amortization of Intangibles	20
Total Operating Expenses	2,150
Operating Income (EBIT)	750
Other Income (Expense)	
Interest Income (Expense)	(120)
Non-Operating Income (Expense)	50
Gain (Loss) on Sale of Assets	(10)
Total Other Income (Expense)	(80)
Income Before Taxes	670
Income Taxes	240
Income After Taxes	430
Extraordinary Gain (Loss)	15
Gain (Loss) on Discontinued Operations	(60)
Cumulative Effect of Change in Accounting	(5)
Net Income	380
Less Preferred Dividends	10
Net Earnings Available for Common	370
Common Dividends	100
Earnings Per Share—Basic	3.70
Earnings Per Share—Diluted	3.66
Dividends per Share	1.00
Consolidated Statement of Retained Earnings	
Balance, Beginning of Year	30
Net Income	370
Cash Dividend Declared on Common	(100)
Retained Earnings Balance, End of Year	300

TABLE 1. FINANCIAL RATIOS

Operating Performance

Asset Management

Total asset turnover =	Net sales revenue / Total assets	=	$8,500 / $4,150	=	2.0x
Inventory turnover =	Cost of goods sold / Inventory	=	$5,600 / $1,400	=	4.0x
Receivables turnover =	Net sales revenue / Net account receivables	=	$8,500 / $980	=	8.7x
Average collection period =	365 / Receivables turnover	=	365 / 8.7	=	42.0 days

Profitability

Gross profit margin =	Gross income / Sales revenue	=	$2,900 / $8,500	=	34.1%
Operating profit margin =	Operating income (EBIT) / Sales revenue	=	$750 / $8,500	=	8.8%
Profit margin =	Net income / Sales revenue	=	$380 / $8,500	=	4.5%
Return on assets =	Net income / Total assets	=	$380 / $4,150	=	9.2%
Return on stockholder's equity =	Net income – preferred dividends / Common equity*	=	$380 – $10 / $1,700	=	21.8%

Liquidity and Financial Risk

Liquidity

Current ratio =	Current assets / Current liabilities	=	$2,800 / $1,100	=	2.5x
Quick ratio =	Current assets – inventory / Current liabilities	=	$2,800 – $1,400 / $1,100	=	1.3x

Financial Risk

Times interest earned =	Operating income (EBIT) / Interest expense	=	$750 / $120	=	6.3x
Debt to total assets =	Total liabilities / Total assets	=	$2,250 / $4,150	=	0.5x
Debt to capital =	Long-term debt / Total capital**	=	$1,000 / $2,900	=	0.3x

* *Total stockholder's equity less preferred stock*
** *Long-term debt plus stockholder's equity*

compares the level of the most liquid assets (current assets) against that of the shortest maturity liabilities (current liabilities). A high current ratio indicates high level of liquidity and less risk of financial trouble. Too high a ratio may point to unnecessary investment in current assets or failure to collect receivables or a bloated inventory, all negatively affecting earnings. Too low a ratio implies illiquidity and the potential for being unable to meet current liabilities and random shocks like strikes that may temporarily reduce the inflow of cash.

The *quick ratio*, or acid test, is similar to the current ratio, but it is a more conservative measure. It subtracts inventory from the current assets side of the comparisons because inventory may not always be quickly converted into cash or may have to be greatly marked down in price before it can be converted into cash.

FINANCIAL RISK

Times interest earned, or interest coverage ratio, is the traditional measure of a company's ability to meet its interest payments. Times interest earned indicates how well a company is able to generate earnings to pay interest. The larger and more stable the ratio, the less risk of

default. Interest on debt obligations must be paid, regardless of company cash flow. Failure to do so results in default if the lender will not restructure the debt obligations.

The *debt-to-total-assets ratio* measures the percentage of assets financed by all forms of debt. The higher the percentage and the greater the potential variability of earnings translate into a greater potential for default. Yet, prudent use of debt can boost return on equity.

The *debt-to-total-capital ratio* is a popular measure of financial leverage, but its name may cause confusion. Debt for this ratio consists only of long-term debt, not total debt. Capital refers to all sources of long-term financing—long-term debt and stockholder's equity. This ratio is interpreted in the same way as the debt-to-total-assets ratio; a high ratio indicates high risk. However, a low level may not be an indication of low risk if current liabilities are high.

THE BOTTOM LINE

Financial ratio analysis relies on historical financial statements to study the past and develop a feel for a company's attractiveness measured through factors such as its competitive position, financial strength, and profitability.

Knowledge of financial ratios should give investors a feel for how a company might react to shifts in industry, financial, and economic environments. ✦