

9.4: Financial Ratio Analysis

Learning Objectives

1. Understand why the numbers found on a balance sheet and an income statement may not be enough to properly evaluate the performance of a business.
2. Understand the concept of financial ratios and the different categories of financial ratios.
3. Acquire the ability to calculate financial ratios and interpret their meaning.

One can say that figures lie. But figures, when used in financial arguments, seem to have the bad habit of expressing a small part of the truth forcibly, and neglecting the other, as do some people we know. “Accounting Quotes,” *Qfinance*, accessed February 14, 2012, www.qfinance.com/finance-and-business-quotes/accounting.

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Section 9.1 discusses the differences between managerial accounting and financial accounting. Managerial accounting focuses on providing information that is useful for the managers of a firm. Financial accounting provides information to interested external constituencies. Both use information derived from financial statements. These numbers, however, may not provide a singular insight into the overall economic effectiveness of any particular business. These numbers must be placed in some form of context. As an example, suppose you are told that a particular business earned \$2 million worth of profit last year. Obviously, earning a \$2 million profit is better than a \$1 million profit and certainly better than a \$2 million loss. However, you are still left with the question of exactly how good that \$2 million profit is. After all, if you were told that Walmart made only \$2 million profit last year, you would likely be concerned with respect to the management capability and performance of Walmart. Making only \$2 million profit on revenues in excess of \$400 billion worth of sales would not be at all impressive. However, if you were told that a mom-and-pop grocery store made \$2 million profit last year based on \$4 million of sales, you would be amazed at that mom-and-pop store and hold them in considerable esteem for their management capability.

One way of putting financial data into a comparative context is known as financial ratio analysis. From a financial accounting standpoint, ratio analysis enables external constituencies to evaluate the performance of a firm with respect to other firms in that particular industry. This is sometimes referred to as comparative ratio analysis. From a managerial accounting standpoint, ratio analysis can assist a management team to identify areas that might be of concern. The management team can track the performance on these ratios across time to determine whether the indicators are improving or declining. This is referred to as trend ratio analysis. There are literally scores of financial ratios that can be calculated to evaluate a firm’s performance.

Financial ratios can be grouped into five categories: **liquidity ratios**, **financial leverage ratios**, **profitability ratios**, **asset management or efficiency ratios**, and **market value ratios**. Because many small businesses are not publicly held and have no publicly traded stock, market ratios play no role in analyzing a small firm’s performance. This section will review some of the most commonly used ratios in each category.

Liquidity ratios provide insight into a firm’s ability to meet its short-term debt obligations. It draws information from a business’s current assets and current liabilities that are found on the balance sheet. The most commonly used liquidity ratio is the current ratio given by the formula

$$\text{current assets} / \text{current liabilities}.$$

The normal rule of thumb is that the current ratio should be greater than one if a firm is to remain solvent. The greater this ratio is above one, the greater its ability to meet short-term obligations. As with all ratios, any value needs to be placed in context. This is often done by looking at standard ratio values for the same industry. These ratios are provided by Dun and Bradstreet; these data are also available on websites, such as Bizstats.com.

Another ratio used to evaluate a business’s ability to meet in short-term debt obligations is the quick ratio—also known as the acid test. It is a more stringent version of the current ratio that recognizes that inventory is the least liquid of all current assets. A firm might find it impossible to immediately transfer the dollar value of inventory into cash to meet short-term obligations. Thus the quick ratio, in effect, values the inventory dollar value at zero. The quick ratio is given by the following formula:

$$\text{current assets} - \text{inventory} / \text{current liabilities}.$$

Using the data provided in the balance sheet for Acme Enterprises (["Acme Enterprises' Balance Sheet, 2005–2010 \(\\$ Thousands\)"](#)) we can compute the current ratio and the quick ratio. The results for Acme Enterprises and its industry's means are provided in Table 9.4.1.

Table 9.4.1: Liquidity Ratio Results

	2005 (%)	2006 (%)	2007 (%)	2008 (%)	2009(%)	2010 (%)
Acme's current ratio	0.83	0.79	0.75	0.70	0.65	0.60
Industry's current ratio	1.15	1.08	1.04	1.02	1.03	1.01
Acme's quick ratio	0.63	0.60	0.57	0.53	0.49	0.45
Industry's quick ratio	1.04	1.02	0.98	0.95	0.94	0.91

One should immediately notice that this business appears to be in serious trouble. None of the current ratios are above of value of 1.0, which indicates that the business would be unable to meet short-term obligations to its creditors should they have to be paid. Acme's current ratios are below the industry's average values; however, it should be noted that the industry's values are quite close to one. Further, the current ratio values for Acme and the industry are declining, but Acme's are declining quite significantly. This indicates the financially precarious position of the firm is growing steadily worse. The quick ratio shows an even direr situation should the firm not be able to sell off its inventory at market value. Acme's quick ratio values are well below the industry's average. Without these two ratios, a quick perusal of the total current assets of Acme Enterprises would result in a false impression that the firm is growing in a healthy fashion and current assets are rising.

Financial leverage ratios provide information on a firm's ability to meet its total and long-term debt obligations. It draws on information from both the balance sheet and the income statement. The first of these ratios—the debt ratio—illustrates the extent to which a business's assets are financed with debt. The formula for the debt ratio is as follows:

$\text{total debt} / \text{total assets}.$

A variation on the debt ratio is the ratio of debt to the total owner's equity (the debt-to-equity ratio). As with the other ratios, one cannot target a specific, desirable value for the debt-to-equity ratio. Median values will vary significantly across different industries. The automobile industry, which is rather capital intensive, has debt-to-equity ratios above two. Other industries, such as personal computers, may have debt-to-equity ratios under 0.5. "Debt/Equity Ratio," *Investopedia*, accessed December 2, 2011, www.investopedia.com/terms/D/debtequityratio.asp. The formula for the debt-to-equity ratio is as follows:

$\text{total debt} / \text{total owner's equity}.$

One can refine this ratio by examining only the long-term portion of total debt to the owner's equity. Comparing these two debt-to-equity ratios gives insight into the extent to which a firm is using long-term debt versus short-term debt. The formula for the long-term debt-to-owner's equity ratio is as follows:

$\text{long-term debt} / \text{total owner's equity}.$

The interest coverage ratio examines the ability of a firm to cover or meet the interest payments that are due in a designated period. The formula for the interest coverage ratio is as follows:

$\text{EBIT} / \text{total interest charges}.$

The financial leverage ratios for Acme and its industry are provided in Table 9.4.2. Interestingly, Acme's debt-to-total-assets ratio has declined over the last six years. Further, its ratio has always been lower than the industry average in every year. This stands in contrast to the liquidity ratios. The business's debt-to-equity ratio has declined precipitously over the last six years and was significantly lower than the industry averages. The same is true for the long-term debt-to-equity ratios. These ratios have declined for several reasons. The total assets of the firm have doubled over the last six years, and equity has grown by a factor of five while the long-term debt has remained constant. It would appear that the firm has been financing its growth with short-term debt and its own profits. However, one should note that the **times interest earned ratio** has declined dramatically, falling to approximately half

the level of the industry average in 2010. This indicates that the firm has less ability to meet its debt obligations. In conjunction with the results of the other ratios, one would say that Acme has relied, excessively, on its short-term debt and should take actions to return to a firmer financial footing.

Table 9.4.2: Financial Leverage Ratios Results

	2005 (%)	2006 (%)	2007 (%)	2008 (%)	2009 (%)	2010 (%)
Acme's debt-to-total assets ratio	0.86	0.78	0.73	0.69	0.67	0.65
Industry's debt-to-total assets ratio	1.01	0.97	0.95	0.92	0.89	0.86
Acme's debt-to-equity ratio	6.14	3.57	2.68	2.22	1.99	1.86
Industry's debt-to-equity ratio	3.31	3.25	3.67	3.11	2.96	2.65
Acme's long-term debt-to-equity ratio	1.88	1.02	0.70	0.53	0.43	0.36
Industry's long-term debt-to-equity ratio	1.52	1.54	1.42	1.32	1.27	1.12
Acme's times interest earned ratio	14.76	12.34	10.68	8.52	7.17	5.52
Industry's times interest earned ratio	11.55	11.61	10.95	10.65	10.43	10.01

The next grouping of ratios is the profitability ratios. Essentially, these ratios look at the amount of profit that is being generated by each dollar of sales (revenue). Remember, from the review of the income statement, we can identify three different measures of profit: gross profit, operating profit, and net profit. Each measure of profit can be examined with respect to the net sales of a business, and each can give us a different insight into the overall efficiency of a firm in generating profit.

The first profitability ratio examines how much gross profit is generated by each dollar of revenue and is given by the following formula:

gross profit margin = gross profit / revenue.

The next examines operating profit per dollar of sales and is calculated in the following manner:

operating profit margin = operating profit / revenue.

Lastly, the net profit margin is the one that is mostly used to evaluate the overall profitability of a business. It is determined as follows:

net profit margin = net profit / revenue.

The profitability ratios for Acme and its industry are provided in Table 9.4.3. Acme has seen a slight increase in its gross profit margin over the last six years, which indicates a reduction in either direct labor or direct materials costs. Acme's gross profit margin is slightly lower, across the six years, than the industry's mean values. Acme's operating profit margins have declined, particularly since 2008. This would indicate, in light of an increasing gross profit margin, that its operating expenses have increased proportionately. Acme's operating profit margins had parity with its industry until 2008. The most troublesome results may be the net profit margins, which experienced a one-third decline over the last six years. Although the industry's net profit margins have

declined, they have not done so at the same rate as those for Acme. These results indicate that Acme needs to carefully review its operational expenses with a clear intention to reduce them.

Table 9.4.3: Profitability Ratios Results

	2005 (%)	2006 (%)	2007 (%)	2008 (%)	2009 (%)	2010 (%)
Acme's gross profit margin	50.0	50.0	51.0	51.0	52.0	52.0
Industry's gross profit margin	51.2	51.3	51.6	51.5	53.2	53.1
Acme's operating profit margin	15.5	14.3	14.0	12.7	12.3	10.9
Industry's operating profit margin	14.7	14.1	14.2	13.2	13.0	13.2
Acme's net profit margin	9.5	8.7	8.4	7.4	7.0	6.0
Industry's net profit margin	9.2	8.9	8.5	8.4	8.1	7.9

The last category of financial ratios is the asset management or efficiency ratios. These ratios are designed to show how well a business is using its assets. These ratios are extremely important for management to determine its own efficiency. There are many different activity or efficiency ratios. Here we will examine just a few. The sales-to-inventory ratio computes the number of dollars of sales generated by each dollar of inventory. Firms that are able to generate greater sales volume for a given level of inventory are perceived as being more efficient. This ratio is determined as follows:

$\text{sales to inventory} = \text{sales} / \text{inventory}.$

There are other efficiency ratios that look at how well a business is managing its inventory. Some look at the number of days of inventory on hand; others look at the number of times inventory is turned over during the year. Both can be used to measure the overall efficiency of the inventory policy of a firm. For simplicity's sake, these ratios will not be reviewed in this text.

The sales-to-fixed-asset ratio is another efficiency measure that looks at the number of dollars of sales generated by a business's fixed assets. Again, one is looking for a larger value than the industry average because this would indicate that a business is more efficient in using its fixed assets. This ratio is determined as follows:

$\text{sales to fixed assets} = \text{sales} / \text{fixed assets}.$

Another commonly used efficiency ratio is the days-in-receivables ratio. This ratio shows the average number of days it takes to collect accounts receivables. The desired trend for this ratio is a reduction, indicating that a firm is being paid more quickly by its customers. This ratio is determined as follows:

$\text{days in receivables} = \text{accounts receivable} / (\text{sales} / 365).$

The 365 in the denominator represents the number of days in a year. A summary of the activity ratios for Acme and the industry is provided in Table 9.4.4.

Table 9.4.4: Efficiency Ratios Results

	2005 (%)	2006 (%)	2007 (%)	2008 (%)	2009 (%)	2010 (%)
Acme's sales to inventory	14.3	14.3	14.3	14.3	14.3	14.3
Industry's sales to inventory	16.2	15.7	15.3	14.9	14.3	13.7

	2005 (%)	2006 (%)	2007 (%)	2008 (%)	2009 (%)	2010 (%)
Acme's sales to fixed assets	8.57	7.02	6.01	5.28	4.75	4.33
Industry's sales to fixed assets	7.64	7.12	6.78	6.55	6.71	6.34
Acme's days in receivables	36.5	36.5	36.5	36.5	36.5	36.5
Industry's days in receivables	33.2	34.6	38.2	37.4	33.9	35.1

Almost immediately one should notice several interesting sets of value. Acme's sales-to-inventory ratios for the period 2005 to 2010 and its days in receivables for the same time frame are constant. This is not true for the industry values. This might indicate that Acme has a rigorous policy of tying its inventory level to sales. Likewise, it would appear that Acme has some formal policy to explicitly link accounts receivable to sales volume. Industry values for both ratios fluctuated across the time span; however, it should be noted that the industry's days in receivables fluctuated across a rather narrow band. Acme's sales to fixed assets have been declining from 2005 to 2010. In fact, it has dropped almost in half. This is a sign that Acme's ability to manage its assets vis-à-vis sales has declined significantly and should be a source of considerable worry for the management team.

Financial ratios serve an extremely useful purpose for small business owners who are attempting to identify trends in their own operations and see how well their business's stand up against its competitors. As such, owners should periodically review their financial ratios to get a better understanding of the current position of their firms.

Video Clip 9.4.1:

Financial Ratios: Debt Management



Basic coverage for calculating debt ratios.

Video Clip 9.4.1:

Financial Ratios: Profitability



Basic coverage for calculating profitability ratios.

Video Clip 9.4.1:

Financial Ratios: Asset Management



Basic coverage for calculating asset management ratios.

Key Takeaways

- Financial ratios enable external constituencies to evaluate the performance of a firm with respect to other firms in a particular industry.
- Ratio analysis can help a management team identify areas that might be of concern.
- The management team can track the performance on these ratios across time to determine whether the indicators are improving or declining.
- Financial ratios can be grouped into five categories: liquidity ratios, financial leverage ratios, asset management or efficiency ratios, profitability ratios, and market value ratios.

EXERCISES

1. In the Appendix (Chapter 16), you will find the income statements and balance sheets for Frank's All-American BarBeQue for the years 2006 to 2010. Compute some of the key financial ratios for this business and discuss the meanings of any trends.
2. Locate the average values of these values for the restaurant industry and comment on how well or poorly Frank's All-American BarBeQue appears to be doing with respect to the industry.
3. Frank's business plan in the Appendix (Chapter 16) provides projected income statements and balance sheets for a five-year forecast horizon. Compute the same ratios as in Exercise 1 and comment on your results.

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