Excellence in Financial Management

Discussion Board Articles – Ratio Analysis

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Ratio Analysis

Cash Flow Ratios

Although not widely used, cash flow ratios can be useful in determining the adequacy of cash and cash equivalents. Cash flow ratios are used depending upon the critical needs of cash. For example, if cash is critical to servicing long-term debt, than Cash Flow to Long-Term Debt would be a good ratio. If liquid assets are critical to meeting current liabilities, than Cash + Marketable Securities to Current Liabilities would be useful. Some of the variations for cash flow ratios include:

Cash Flow / Total Debt, Cash Flow / Long-Term Debt, Cash + Marketable Securities / Working Capital, Cash + Marketable Securities / Current Liabilities.

Another good cash flow ratio is Operating Cash Flow to Net Income. This ratio shows the extent to which Net Income is supported by operating cash flows. Cash flow from operations is calculated by adjusting Net Income for non-cash items, such as depreciation. Cash flow is reported on the Statement of Cash Flows and cash flow ratios can be calculated from a complete set of financial statements.

Accounts Receivable Ratio Analysis

Ratio analysis can be used to tell how well you are managing your accounts receivable. The two most common ratios for accounts receivable are turnover and number of days in receivables. These ratios are calculated as follows:
Accounts Receivable Turnover = Credit Sales / Average Receivable Balance.

Example: Annual credit sales were $ 400,000, beginning balance for accounts receivable was $ 55,000 and the yearend balance was $ 45,000. The turnover rate is 8, calculated as follows: Average receivable balance is $ 50,000 ($ 55,000 + $ 45,000) / 2. The turnover ratio is $ 400,000 / $ 50,000. This indicates that receivables were converted over into cash 8 times during the year.

Number of Days in Receivables = 365 Days in the Year / Turnover Ratio. Using the same information from the previous example gives us 46 days on average to collect our accounts receivable for the year.

Two other ratios that can be used are Receivables to Sales and Receivables to Assets. Referring back to our first example, we would have a Receivable to Sales Ratio of 12.5% ($ 50,000 / $ 400,000). Remember ratios are only effective when used in comparison to other benchmarks, trends or industry standards. A turnover ratio well below the industry average would indicate much slower conversion of receivables than other companies. A much lower Receivables to Sales Ratio than the industry average might indicate much better policies in getting sales converted into cash.

Asset Ratio Analysis

The ability to generate revenues and earn profits on assets can be measured through ratio analysis. Several types of ratios can be calculated regarding the utilization of assets.

Example: Asset Turnover gives an indication of how often assets are converted into sales. The Asset Turnover Ratio is calculated as follows: Sales / Average Assets. If annual sales were $ 200,000 and the average asset balance for the year was $ 160,000, the asset turnover rate would be 1.25. A higher turnover rate implies effective use of assets to generate sales.

Receivable and Inventory ratios are part of asset ratio analysis. Inventory Turnover gives an indication of how much inventory is held during the reporting period. Example: Cost of Goods Sold for the Year was $ 270,000 and the average inventory balance during the year was $ 90,000. This results in an inventory turnover rate of 3 ($ 270,000 / $ 90,000). The average number of days inventory is held is calculated as follows: 365 days in the reporting period / inventory turnover rate. In our example, this would be 122 days.

Finally, you can look at the use of capital for generating revenues. Two common ratios are Total Capital Turnover and Investment Rate. Total Capital Turnover is calculated as: Sales / Average Total Capital. Average Total Capital consists of both debt and equity. The Investment Rate is the rate of change in capital. The Investment Rate is calculated by simply dividing the amount of change in capital / total beginning capital. A high investment rate would imply an aggressive program for generating future sales.

Accounts Payable Ratio Analysis

Ratio analysis can be used to determine the time required to pay accounts payable invoices. This ratio is calculated as follows: Accounts Payables / Purchases per Day. For example, assume we have total accounts payables of $ 20,000 and our annual purchases on account total $ 400,000. Our purchases per day are $ 400,000 / 365 days in the annual reporting period or $ 1,096. The average number of days to pay accounts payable is $ 20,000 / $ 1096 or 18 days. The result of this ratio should be compared to the average terms available from creditors.

If the average number of days is close to the average credit terms, this may indicate aggressive working capital management; i.e. using spontaneous sources of financing. However, if the number of days is well beyond the average credit terms, this could indicate difficulty in making payments to creditors.

Another ratio that can be used in managing accounts payable is Sales to Accounts Payable. This ratio gives an indication of a company's ability to obtain interest free funds. For example, if we had sales of $ 600,000 and accounts payables of $ 20,000, this gives us a ratio of 30. As this ratio increases, it becomes more difficult to obtain trade credit.

Managing Return on Equity

For publicly traded companies, one of the most watched financial measurements is return on equity. Return on Equity is calculated by dividing Net Income over Average Shareholder's Equity. Financial Managers break this ratio down into three components for managing the organization. The three components of Return on Equity are: Return on Sales, Asset Turnover, and Financial Leverage. Therefore, we can breakdown Return on Equity as: (Net Income / Sales) x (Sales / Assets) x (Assets / Equity).

Example: Net Income is $ 100,000, Equity is $ 400,000, Sales were $ 500,000 and Assets are $ 600,000. Return on Equity = ($ 100,000 / $ 500,000) x ($ 500,000 / $ 600,000) x
($ 600,000 / $ 400,000) = .20 x .8333 x 1.50 = .25 or 25%.

The trick is to manage these three components in such a way that you maximize Return on Equity. Remember if you increase one ratio, it will decrease a corresponding component. For example, if you were to increase assets, this would increase your leverage (assets / equity), but would decrease your turnover (sales / assets). Additionally, you can further breakdown the three component ratios into more detail ratios. For example, the first component ratio is Return on Sales. This can be broken down into Operating Margin on Sales. The point is to start at the top - Return on Equity and move to the middle layer (3 component ratios) and than move to the bottom layer (detail ratios).

Profitability Ratios

Profitability Ratios are used to evaluate management's ability to create earnings from revenue-generating bases within the organization. Profitability Ratios measure the earnings by dividing the earnings by a base, such as assets, sales or equity. Four common profitability ratios are:

Profit Margin on Sales = Net Income / Sales
Operating Margin on Sales = Earnings Before Interest & Taxes / Sales
Return on Assets = Net Income / Average Assets
Return on Equity = Net Income / Average Common Equity

Example: Net Sales (Gross Sales less Allowances) are $ 500,000.

Earnings Before Interest and Taxes are $ 50,000 and Net Income is $ 25,000. Asset Balances are: Beginning $ 190,000 and Ending $ 210,000
Common Stock Balances: Beginning $ 325,000 and Ending $ 325,000
Retained Earnings Balances: Beginning $ 100,000 and Ending $ 150,000.

Profit Margin = $ 25,000 / $ 500,000 = .05 or 5%
Operating Margin = $ 50,000 / $ 500,000 = .10 or 10%
Return on Assets = $ 25,000 / ($ 190,000 + $ 210,000) / 2 = .125 or 12.5%
Return on Equity = $ 25,000 / ($ 425,000 + $ 475,000) / 2 = .055 or 5.5%

Profitability ratios are widely used by creditors, investors, and others who are interested in finding out how management generates its earnings.

Operating Cost Ratios

Ratios can be used to help measure the effectiveness over cost control. Operating costs can be monitored with the use of direct and indirect operating ratios. Examples of Direct Operating Ratios are:
Direct Labor to Sales = Direct Labor Costs / Sales
Direct Materials to Sales = Direct Materials / Sales
Factory Overhead to Sales = Factory Overhead / Sales

Indirect Operating Ratios can be computed for almost any itemized expense. Two examples are:
Computer Expenses to Sales = Computer Expenses / Sales
Travel Expenses to Sales = Travel Expenses / Sales

Example: Direct Labor Costs are $ 100,000 Factory Overhead is $ 200,000, Computer Expenses are $ 15,000 and Sales were $ 500,000.
Direct Labor to Sales = $ 100,000 / $ 500,000 = .20 or 20%
Factory Overhead to Sales = $ 200,000 / $ 500,000 = .40 or 40%
Computer Expenses to Sales = $ 15,000 / $ 500,000 = .03 or 3%

Operating cost ratios are often used by production managers to monitor trends and identify problems. If a significant change occurs, the problem must be identified as either internal (such as operations) or external (such as economic conditions). Since investors and other outsiders don't have access to operating information, operating ratios are rarely used outside the organization.

Measuring Sustainable Growth

Is there such a thing as too much growth? In financial management, we try to balance the management of growth with our asset base. For example, if sales were to grow too fast, than we would deplete our financial assets resulting in extreme risks to the organization. If sales grow too slow, than we run the risk of destroying value by holding assets that earn a rate below the cost of capital. The objective in financial management is to manage a sustainable rate of growth that creates value year after year.

The growth rate in sales is limited by the growth we can obtain from the equity side of the Balance Sheet. Therefore, sustainability is a function of equity growth rates, not sales growth rates. The formula for calculating a sustainable growth rate (G) is:

G = Margin x Turnover x Leverage x Retention
Margin = Net Income / Sales
Turnover = Sales / Assets
Leverage = Assets / Equity
Retention = % of Earnings Retained

Consequently, if we want to maintain a consistent level in profit margins, asset turnover, leverage, and retained earnings, than we should grow our sales by G (sustainable growth rate). Changing the sustainable growth rate is a function of the four components of sustainable growth. For example, eliminating marginal products can increase the Margin component or paying out less dividends will increase the Retention component. The trick is to manage the four components so that sales growth follows the sustainable growth rate.

Using the Z Score to Assess Bankruptcies

Financial insolvency or bankruptcy can be forecasted using the Z Score. The Z Score combines several ratios with a statistical application called MDA - Multiple Discriminate Analysis. The Z Score is highly accurate in predicting bankruptcies. The Z Score is about 90% accurate in forecasting business failures the first year and about 80% accurate the second year.

The Z Score is calculated by adding five ratios with applicable MDA weights:

$Z = 1.2 (A) + 1.4 (B) + 3.3 (C) + .6 (D) + .999 (E)$

A: working capital / total assets
B: retained earnings / total assets
C: earnings before interest taxes / total assets
D: market value of equities / book value of debt
E: sales / total assets

The following guideline is used to score an organization:
If the Z Score is 1.8 or less, very high probability of bankruptcy.
If the Z Score is 1.81 to 2.99, not sure about bankruptcy.
If the Z Score is 3.0 or higher, bankruptcy is unlikely.

Example: Total Assets = $ 1,000, Retained Earnings = $ 400, Earnings Before Interest Taxes = $ 50, Sales = $ 1,500, Market Value of Stock = $ 600, Book Value of Debt = $ 700, Working Capital = $ 100.

1.2 x ($ 100 / $ 1,000) = .120
1.4 x ($ 400 / $ 1,000) = .560
3.3 x ($ 50 / $ 1,000) = .165
.6 x ($ 600 / $ 700) = .514
.999 x ($ 1,500 / $ 1,000) = 1.499
Total Z Score = 2.86 Not Sure