

Financial Ratios

Financial ratio analysis is second to none at revealing a company's true value. No single ratio is foolproof or comprehensive. Each ratio is just one piece of a big puzzle. But when combined into a whole, these pieces create a clear and unequivocal picture of firm value.

There are many more ratios than the ones we present below. But the ones below are the most useful and the most enlightening. The ratios below yield the biggest bang for the buck.

For almost every one of the ratios we present, it is true to say that how the ratio is changing can be as illuminating and meaningful as the ratio itself. We encourage you to study these ratios, how they (and their components) are changing, and how they compare to industry averages. You may be surprised at how effective something as straightforward and logical as ratio analysis can be.

We will present the ratios in this report in the following order:

Profitability Ratios

- Gross Profit Margin
- Operating Profit Margin
- Net Profit Margin
- Return on Assets
- Return on Equity
- Return on Invested Capital

Financial Risk – Solvency Ratios

- Debt to Equity Ratio
- Debt to Assets Ratio
- Equity to Assets Ratio
- Capital Structure Leverage Ratio
- Interest Coverage Ratio
- Times Interest Earned Ratio

Efficiency Ratios

- Asset Turnover
- Inventory Turnover
- Accounts Receivable Turnover
- Accounts Payable Turnover
- Days Inventory Outstanding
- Days Receivable Outstanding
- Days Payable Outstanding

Valuation Ratios

- Price to Earnings Ratio
- Price to Book Ratio
- Price to Sales Ratio
- Earnings Yield
- Dividend Yield
- Earnings Yield (EV-Based)

Financial Risk – Liquidity Ratios

- Cash Ratio
- Quick Ratio
- Current Ratio
- Acid Test Ratio
- Payout Ratio
- Dividends to Cash Flow Ratio
- Retention Ratio
- Plowback Ratio

For almost every one of the ratios we present, it is true to say that how the ratio is changing can be as illuminating and meaningful as the ratio itself. Studying how a ratio is changing and trying to determine where it will be in the future is time well spent.

Also, it is very informative to compare ratios of a given firm to what is normal for the industry that the firm is in. There are a few near-universal ratios that transcend industries better than most other ratios (e.g. dividend yield, return-on-assets [ROA], earnings yield (EV-Based)). But even these ratios should not be used blindly, myopically, or in isolation. Even the most powerful ratios should be put in relative terms and should be considered in relation to many other numbers.

Financial ratios usually reveal four different aspects of a firm: profitability, efficiency, financial risk, valuation. Each of the ratios we present can be put in one of these four classes. We will present them in the following order:

Profitability Ratios

$$\text{Gross Profit Margin} = \frac{\text{Gross Operating Profit}}{\text{Sales}}$$

$$\text{Operating Profit Margin} = \frac{\text{Operating Profit}}{\text{Sales}}$$

$$\text{Net Profit Margin} = \frac{\text{Net Profit}}{\text{Sales}}$$

$$\text{Cost of Good Sold Percentage} = \frac{\text{Cost of Goods Sold}}{\text{Sales}}$$

Our first three ratios reveal how much profit a firm makes for every dollar of sales it generates. These ratios are called “margin” ratios. And they vary depending upon which version of profits is put in the numerator. By using these three ratios in combination, you can get a very good idea about where a firm is succeeding or failing.

Gross Profit Margin is the margin ratio that uses the most generous interpretation of profit. In the numerator is the gross operating profit. This is the profit that results if the only thing deducted from sales is the cost of goods sold. This ratio reveals how profitable a firm is independent of all costs other than the costs to obtain the goods that the firm sells.

Operating Profit Margin uses operating profit in the numerator. This ratio gives the clearest indication of how profitable a firm is independent of how it is financing its operations. If this margin is strong and healthy, but the firm has weak or negative net profit, then the firm is probably spending too much on financing. The firm should probably reduce its debt or try to refinance its debt.

Net Profit Margin is net profit divided by sales. This ratio shows how much a firm is earning on every dollar it sells taking all costs into consideration.

COGS Percentage ratio shows a firm’s profitability from a different perspective. This ratio reveals what a firm’s most basic and important costs are relative to sales.

The methodology used in the COGS percentage ratio can be applied to other costs. You can come up with a “cost percentage ratio” for any cost she feels is important to track by placing that cost in the numerator and sales in the denominator.

Profitability Ratios Continued.....

$$\text{Return on Assets} = \frac{\text{Operating Profit}}{\text{Total Assets}}$$

$$\text{Return on Equity} = \frac{\text{Net Income}}{\text{Common Equity}}$$

$$\text{Return on Invested Capital} = \frac{\text{NOPAT}}{\text{Invested Capital}}$$

NOPAT = Net Operating Profit After Taxes

*NOPAT = Operating Profit * (1 - Eff. Tax Rate)*

Invested Capital = Total Assets - NIBCL

(NIBCL = Non-interest bearing current liabilities)

(NIBCL is usually accounts payable and tax liabilities)

Invested Capital = Fixed Assets + WC - Cash

WC = Working Capital

WC = Current Assets - Current Liabilities

The "Return" ratios show profit relative to some measure of the funds invested to generate that profit.

Return on Assets (ROA) ratio reveals how profitable and successful a firm is relative to all the assets it employs to conduct business. For simplicity and effectiveness, this is probably the single best ratio revealing profitability available.

Return on Equity (ROE) ratio is very similar to the ROA ratio, except that it also takes into consideration how a firm is financing its operations. If a firm has a very high ROE relative to ROA, then the firm is probably using a great deal of leverage or it is financing its leverage very effectively and cheaply.

Return on Invested Capital (ROIC) is a slightly more detailed version of the ROA ratio. The ROIC subtracts taxes from operating profit in the numerator. The result is called NOPAT. And it adjusts the "Total Assets" in the denominator by assets that the firm didn't have to finance.

Certain spontaneous items arise that a firm does not have to pay interest on. And therefore, these items are not truly "invested capital." And they should be removed from the "Total Assets" figure to determine a firm's true invested capital.

This adjustment can get a little complicated because there are a number of ways to calculate invested capital. We have presented two of the most popular. The first starts with total assets and subtracts non-interest bearing current liabilities (usually accounts payable and taxes payable).

The second starts with fixed assets and adds working capital, and subtracts cash. We prefer the first method because, using the second method, it is sometimes difficult to calculate fixed assets.

Efficiency Ratios

$$\text{Asset Turnover} = \frac{\text{Sales}}{\text{Total Assets}}$$

$$\text{Inventory Turnover} = \frac{\text{Cost of Goods Sold}}{\text{Average Inventories}}$$

$$\text{Accounts Receivable Turnover} = \frac{\text{Sales}}{\text{Average Accounts Receivable}}$$

We have seven efficiency ratios. The first four are called “turnover ratios.” Turnover ratios are sometimes referred to as “activity ratios.”

Asset Turnover reveals how much sales a firm is generating for every dollar of assets it employs. The higher this number is, the better the company is performing.

Inventory Turnover is the ratio of cost of goods sold to average inventories. It reveals how many times in a year inventory is sold and then replenished. When this number is high, inventory is flying off the shelf. When it is low, inventory is not moving. A low ratio may indicate overstocking, obsolescence or deficiencies in the product line or marketing effort.

Accounts Receivable Turnover is sales divided by average accounts receivables, and it reveals the speed with which a firm is turning accounts receivable into cash. When this number is high, a firm does not have to extend much credit to generate sales. If it is low, a firm is granting generous credit terms to generate sales. This practice is bad and will usually lead to questionable sales and collection problems.

Efficiency Ratios Continued....

$$\text{Accounts Payable Turnover} = \frac{\text{Purchases}}{\text{Average Accounts Payable}}$$

$$\text{Purchases} = \text{COGS} + \text{Ending Inventory} - \text{Beginning Inventory}$$

$$\text{Days Inventory Outstanding} = \frac{365}{\text{Inventory Turnover}}$$

$$\text{Days Receivable Outstanding} = \frac{365}{\text{Receivable Turnover}}$$

$$\text{Days Payable Outstanding} = \frac{365}{\text{Accounts Payable Turnover}}$$

Accounts Payable Turnover indicates the speed by which a firm pays for purchases on account. Some investors like this number to be high because it indicates a firm is paying its bills in cash quickly. Others like it to be low because it indicates a firm is taking full advantage of a low-cost method of funding its business.

Sometimes ratios have two meanings, and you have to consider them in context to understand what they mean. You must look at a constellation of other ratios and consider the industry a firm is in to determine whether a high or low number good or bad.

Most of the turnover ratios mentioned above can be converted into “Days Outstanding” ratios. These ratios are calculated by dividing 365 by one of the turnover ratios

Days Inventory Outstanding is simply the number of days in the year, 365, divided by the inventory turnover. This number indicates how many days on average it takes a firm to turn its inventory into sales.

Days Receivable Outstanding is simply the number of days in the year, 365, divided by the accounts receivable turnover. This number indicates how many days on average it takes a firm to turn its credit sales into cash.

Days Payable Outstanding is simply the number of days in the year, 365, divided by the accounts payable turnover. This number indicates how many days it takes a firm to pay for its credit purchases with cash.

Financial Risk – Liquidity Ratios

A firm can be solvent but not liquid. In other words, a firm can have little to no debt, but also not have enough cash. Therefore, we need two different types of ratios to determine the dual nature of financial risk of a firm.

Liquidity ratios are designed to reveal if a firm has enough cash and cash-like assets. They measure short-term liquidity risk.

Solvency ratios are designed to reveal if a firm has a modest amount of debt and other liabilities. They measure long-term solvency risk. We will start by explaining liquidity ratios.

There are three primary liquidity ratios. They vary in terms of the number used in the numerator.

$$\text{Cash Ratio} = \frac{\text{Cash} + \text{Cash Equivalents}}{\text{Current Liabilities}}$$

$$\text{Quick Ratio} = \frac{\text{Cash} + \text{Securities} + \text{Receivables}}{\text{Current Liabilities}}$$

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

$$\text{Acid Test Ratio} = \text{Quick Ratio}$$

Cash Ratio is the most demanding liquidity ratio. This ratio allows only cash and near-cash instruments to be placed in the numerator. Since it is unequivocal what cash is worth, this is the most reliable of the liquidity ratios. It measures how much cash a firm has relative to its short-term liabilities (i.e. current liabilities).

Quick Ratio is slightly less demanding than the cash ratio. This ratio permits items like stocks, bonds, receivables and any other item that can **quickly** be converted to cash to be placed in the numerator. This ratio is less reliable than the cash ratio since the extra items considered cannot always be converted to cash dollar for dollar.

Current Ratio is the most accommodating of the liquidity ratios. It allows any current asset (an asset that can or will be converted to cash in one year or less) in the numerator. Since the true value of current assets is debatable, this is the least reliable of the liquidity ratios.

Acid Test Ratio is simply the Quick Ratio by another name.

Financial Risk – Liquidity Ratios Continued....

$$\text{Payout Ratio} = \frac{\text{Dividends (Total)}}{\text{Net Income}}$$

$$\text{Retention Ratio} = \frac{\text{Net Income} - \text{Dividends (Total)}}{\text{Net Income}}$$

$$\text{Plowback Ratio} = \text{Retention Ratio}$$

$$\text{Payout Ratio (Cash)} = \frac{\text{Dividends (Total)}}{\text{Cash Flow from Operations}}$$

There are three other ratios that are sometimes considered liquidity ratios. These ratios are designed to reveal how safe a firm's dividend is.

Payout Ratio is simply a firm's total dividend relative to a firm's net income. This number cannot be greater than one for very long before a firm's dividend will need to be cut. Payout ratios that are consistently too high may indicate a firm's dividend is not safe.

Retention Ratio is similar to the Payout Ratio but it takes a slightly different perspective. Instead of revealing how much of income is paid out, it reveals how much is retained.

Plowback ratio is simply the retention ratio by another name.

Payout Ratio (Cash-Based) is identical to the Payout Ratio, except net income is replaced by cash flow from operations. Since dividends are paid from cash, many believe cash flow from operations is a more meaningful number and the dividend-to-cash-flow ratio has greater predictive power than the standard payout ratio.

Financial Risk – Solvency Ratios

$$\text{Debt to Equity Ratio} = \frac{\text{LongTerm Debt}}{\text{Shareholder's Equity}}$$

$$\text{Debt to Assets Ratio} = \frac{\text{LongTerm Debt}}{\text{Total Assets}}$$

$$\text{Equity to Assets Ratio} = \frac{\text{Shareholder's Equity}}{\text{Total Assets}}$$

$$\text{Capital Structure Leverage Ratio} = \frac{\text{Total Assets}}{\text{Shareholder's Equity}}$$

$$\text{Interest Coverage Ratio} = \frac{\text{Earnings Before Interest and Taxes}}{\text{Interest Expense}}$$

$$\text{Times Interest Earned} = \text{Interest Coverage Ratio}$$

Debt to Equity Ratio - Usually the largest and most important liability is long-term debt. Debt-to-Equity ratio relates long-term debt to shareholder's equity.

Debt to Assets Ratio – Because equity can sometimes be very small (or even negative), it is usually better to relate long-term debt to total assets. Total assets will almost never be zero or negative; and therefore, the debt to assets ratio almost never gives misleading or undefined numbers.

Equity to Assets Ratio – Long-term debt is not the only liability. To get an idea of a firm's total liabilities, it is useful to study shareholder's equity. Equity is the difference between total assets and total liabilities; therefore, indirectly, it reflects total liabilities. A firm with a high equity to asset ratio has low liabilities.

Capital Structure Leverage Ratio is the reciprocal of the equity to assets ratio. This ratio reflects how aggressive a firm is being in using liabilities to leverage its performance. You can multiply this leverage ratio by the return-on-assets (ROA) ratio to get a rough idea of what a firm's return-on-equity (ROE) will be.

Interest Coverage Ratio relates a firm's profits to how much it is paying in interest expense. This ratio is a very useful ratio to study because it is very different from the four previous solvency ratios.

Times Interest Earned is the interest coverage ratio by another name.

Valuation Ratios

$$\text{Price to Earnings Ratio} = \frac{\text{Price per Share}}{\text{Earnings per Share}}$$

$$\text{Price to Book Ratio} = \frac{\text{Price per Share}}{\text{Book Value per Share}}$$

$$\text{Price to Sales Ratio} = \frac{\text{Price per Share}}{\text{Sales per share}}$$

A firm could score high marks on all the ratios we have presented so far; however, if it is not reasonably priced, it will not make a good investment. The valuation ratios are designed to determine if a firm is reasonably priced.

Price to Earnings Ratio is intellectually appealing because it is the easiest ratio of value to grasp. It is simply price per share divided by earnings per share (EPS). EPS is the one feature all firms have in common.

Price to Book Ratio relates price to book value of equity per share. It is superior to the price to earnings ratio in some respects and inferior to it in others. Book value per share is not as erratic as earnings per share, but it is also recorded at historical cost; therefore, it is less timely and sometimes less accurate.

Price to Sales Ratio has some of the positive aspects of both the price to earnings ratio and the price to book ratio. Sales are not as erratic as earnings; so the price-to-sales ratio has less noise than the price-to-earnings ratio. And sales are recorded in current dollars, not historical dollars; so the information in it is timely.

However, the price to sales ratio is very industry specific; it can vary dramatically, depending on what industry a firm is in. Therefore, the price to sales ratio needs to be put in relative terms. This ratio, more than most ratios, should be studied relative to what is normal for the firm in question and relative to what is normal for the industry the firm is in.

Valuation Ratios Continued.....

$$\text{Earnings Yield} = \frac{\text{Earnings per Share}}{\text{Price per Share}}$$

$$\text{Dividend Yield} = \frac{\text{Dividends per Share}}{\text{Price per Share}}$$

$$\text{Earnings Yield (EV Based)} = \frac{\text{Operating Profit}}{\text{Enterprise Value}}$$

$$\begin{aligned} \text{Enterprise Value} \\ &= \text{Equity} + \text{Debt} + \text{Preferred Stock} \\ &+ \text{Minority Interest} - \text{Cash} \end{aligned}$$

Closely related to these value ratios are the yield ratios. In a sense, these ratios are also a type of valuation ratio. These ratios put the price of the firm in the denominator instead of in the numerator. They reveal the amount of profit or cash an investor can expect for every dollar they invest.

Earnings Yield is the reciprocal of the price-to-earnings ratio, and it tells how much profit an investor can expect based upon what a firm has already proven it can earn. Earnings yield is superior to the price-to-earnings ratio because it is linear and never gives an undefined number.

Dividend Yield is the dividends per share relative to price per share. Many investors argue this number is a much more meaningful and reliable number than any other single number available. The only problem with using it is that only about half of the firms pay a dividend.

Earnings Yield (EV Based) is similar to the earnings yield, but it shows what investors can expect to earn in profit if they buy the whole company and not just the equity portion of it. To learn more about this powerful and useful ratio, read the special report we make available on the earnings yield (The Brilliance of the Earnings Yield (EV-Based)).