

Ratio Analysis

Disciplined thinking focuses inspiration rather than constricts it.

~ Anonymous

Ratio Analysis compares significant numbers from your financial statements. Rather than focusing on specific volumes, ratios are indicators of the broad state of your business. What they indicate is dependent upon the nature of your company, comparisons to your company's historical ratio values, and comparisons to competitive companies in the same industry. BizPlanBuilder calculates 31 ratios.

Financial ratios are useful to you and potential investors because they allow comparisons to be made between your business and others of the same type.

Standard ratios for many industries are available from on-line database services and are also published in various reference books available at most libraries.

Ratio Analysis		Your Company Name Here					Trailing 3 yr		
		2013	2014	2015	2016	2017	Average	BizStats	Variance
Liquidity Ratios									
4	Current Ratio	(10.6)	(22.3)	(33.3)	263.8	363.1	197.9	1.0	19787.9%
5	Quick Ratio (Acid Test)	(10.6)	(22.3)	(33.3)	263.8	363.1	197.9	1.0	19788.1%
Working Capital Cycle									
8	Receivables Turnover	12.7	12.2	12.2	12.2	12.2	12.2	12.0	1.3%
9	Day's Receivables	28.8	30.0	30.0	30.0	30.0	30.0	30.0	0.1%
10	Payables Turnover	2.1	2.1	2.1	(12.6)	(13.0)	-7.8	49.6	-15.7%
11	Days' Payables	170.0	170.1	170.2	(29.1)	(28.1)	37.7	45.0	83.7%
12	Inventory Turnover	14,454.7	11,562.8	8,779.1	5,727.1	3,163.5	5889.9	5.8	101549.9%
13	Day's Inventory	0.0	170.1	170.2	(29.1)	(28.1)	37.7	60.0	62.8%
14	Sales / Working Capital	(0.0)	(0.0)	(0.0)	0.4	0.8	0.4	16.6	2.2%
Leverage Ratios									
17	Interest Coverage	NA	NA	NA	NA	NA	0.0	1.5	0.0%
18	Total Liabilities / Stockholder's Equity (Debt/Wor	-8.6%	-4.3%	-2.9%	0.4%	0.3%	-0.8%	100%	-0.8%
Operating Ratios									
21	Gross Profit Margin	-8258%	-6851%	-4981%	-3010%	-1485%	-3158.7%	100.0%	-3158.7%
22	Operating Profit Margin	-45294%	-39299%	-28704%	-17537%	-9577%	-18605.9%	100.0%	-18605.9%
23	Net Profit Margin	-45294%	-39299%	-28704%	-17537%	-9577%	-18605.9%	100.0%	-18605.9%
24	EBITDA	\$ (927,627)	\$ (1,010,723)	\$ (1,060,432)	\$ (1,106,708)	\$ (1,134,992)	\$ (1,100,711)		
25	Operating Cash Flow	-1064%	-1209%	-1207%	7746%	7638%	4792.2%	100.0%	4792.2%
26	Operating Ratio	-45294.3%	-39299.4%	-28704.2%	-17536.8%	-9576.8%	-18605.9%	100.0%	-18605.9%
27	Sales / Day (244 business days) (000)	\$ 8	\$ 11	\$ 15	\$ 26	\$ 49	\$ 30	\$ 100	29.9%
HR Efficiency									
29	Number of Employees	13	13	13	13	13	13		
30	Sales per Employee (000)	\$ 158	\$ 198	\$ 284	\$ 485	\$ 912	\$ 560	\$100	\$ 6
31	Income from Operations / Employee (000)	\$ (71,356)	\$ (77,748)	\$ (81,572)	\$ (85,131)	\$ (87,307)	\$ (84,670)	\$100	\$ (847)
32	Net Income After Taxes / Employee (000)	\$ (71,356)	\$ (77,748)	\$ (81,572)	\$ (85,131)	\$ (87,307)	\$ (84,670)	\$100	\$ (847)
Marketing Efficiency									
35	Sales / Cost of Marketing & Sales	0.8%	0.8%	1.1%	1.8%	3.3%	2.1%		
36	Return on Marketing	-361.6%	-325.7%	-325.2%	-324.1%	-317.0%	-322.1%		
R&D Efficiency									
39	Return on Development	-602.5%	-628.7%	-628.3%	-627.4%	-616.2%	-624.0%		
Profitability Ratios									
42	Return On Equity	NA	NA	NA	NA	NA	0.0%	100.0%	0.0%
43	Total Debt to Stockholders' Equity	NA	NA	NA	NA	NA	0.0%	100.0%	0.0%
Asset Management (Efficiency)									
46	Total Liabilities / Total Assets	-9.4%	-4.5%	-3.0%	0.4%	0.3%	-0.8%	100%	-0.8%
47	Total Debt to Total Assets	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%	0.0%
48	Debt to Capitalization	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%	0.0%
49	Return on Assets	109%	54%	36%	27%	22%	28%	100%	28.3%
50	Total Assets Turnover	(0.00)	(0.0)	(0.0)	(0.0)	(0.0)	0.0	1.0	-0.2%

As part of an agreement for financing, your lender or investor may require that you maintain certain ratios. Any ratio that must be maintained at a specific value as part of a financing agreement should be calculated and monitored on a timely basis. If you neglect to do this, you risk being out of compliance with your lender or investor, which could result in the debt being called for immediate repayment.

“...for the period”

We keep saying ‘period’ because you can and should measure these ratios for different periods (Months / Quarters / Years) and compare in order to see any trends that may be developing and that can be corrected if necessary.

Liquidity Ratios

Current Ratio

- $\text{Total Current Assets} / \text{Total Current Liabilities}$

These values come from your balance sheet and are a measure of your liquidity. Your current ratio indicates your ability to pay your current debt out of your current assets. The higher the ratio, the greater your “cushion.” Although a satisfactory value for a current ratio varies from industry to industry, a general rule of thumb is that a current ratio of 2 to 1 or greater is fairly healthy. Thinking in terms of dollars, a 2 to 1 ratio means that you have \$2 of current assets from which to pay every \$1 of current bills. A smaller current ratio may mean that you have successfully negotiated to pay your suppliers later than the usual 30 days, which essentially gives your company an interest-free source of cash. Let’s say your current assets are \$15,000 and current liabilities are \$10,000; this gives you a current ratio of 1.5 to 1. In this scenario, you could improve your current ratio to 2 to 1 by paying \$5,000 of your current liabilities with your current assets, reducing both by \$5,000. If your suppliers were willing to wait for payment without charging you interest, this would probably be a bad idea (unless your financing agreement requires you to maintain a current ratio of 2 to 1).

Quick Ratio

- $(\text{Cash} + \text{AR}) / \text{Total Current Liabilities}$

This is a slightly more conservative measure of liquidity because it uses only your available cash and accounts receivable in the equation.. A value < 1:1 implies “dependency” on inventory to liquidate short-term debt. Also called *Acid-Test Ratio*, this is very similar to your current ratio but it includes only those current assets that can be most readily used to pay bills today: cash and accounts receivable. The quick ratio excludes inventory, which must first be sold and the cash collected before it can be used to pay liabilities. It also excludes current assets like prepaid expenses, which are never converted to cash. They are simply assets you paid for in advance. As a result, the quick ratio is a good indication of how well you are able to meet your current liabilities in a crunch situation. In general, you should try to maintain a quick ratio of 1 to 1, which means you have \$1 worth of cash and accounts receivable for every \$1 dollar of total current liabilities.

Working Capital Cycle

Receivables Turnover

- $\text{Net Sales} / \text{Trade AR}$

(Sales/Receivables Ratio) Measures number of times AR turns over during the period. Higher the turn, shorter the time between sale and collection of the cash. Does not take into consideration seasonal fluctuations nor a large proportion of cash sales compared to total sales.

Days' Receivables

- $\text{Days in Period (usually 365)} / \text{Sales/Receivables Ratio}$

Average time in days that your receivables are outstanding. Measures your control of your credit and collections. Greater the days, greater probability for delinquencies.

Days' Sales Outstanding

- $\text{Days in period (91)} / \text{COGS} / \text{Payables Ratio}$

(aka Days' Payables) Average length of time trade debt is outstanding

Payables Turnover

- $\text{COGS} / \text{Payables for Inventory}$

Number of times AP turns during the period. A higher turn for your payables indicates a shorter the time between purchase and payment. If your payables turnover is lower than your industry, a lender or investor may wonder if you have a cash shortage, you are disputing invoices with vendors, enjoying extended terms or purposefully expanding your trade credit.

Inventory Turnover

- $\text{COGS} / \text{Inventory}$

Number of times inventory turns in period. High turn can indicate better liquidity or good merchandising or shortage of needed inventory for sales. Low turn can mean overstocking, obsolescence, builds to inaccurate sales forecast – can also a planned inventory build-up in anticipation of possible material shortages. You still need to take seasonal fluctuations into account.

Days' Inventory

- $\text{Days in period (91)} / \text{COGS} / \text{Inventory Ratio}$

Average length of time units are in inventory.

Sales / Working Capital

- $\text{Sales} / (\text{AR} + \text{Inventory} - \text{AP})$

Net Working Capital equals current assets minus current liabilities. Working Capital measures the margin of protection for current creditors and reflects your ability to finance current operations. Comparing sales to working capital this way measures how efficiently your working capital is employed. Low ratio may mean ineffective use of WC. High ratio may mean “overtrading”— a vulnerable position for creditors.

Operating Ratios

Operating ratios help measure the effectiveness of management performance.

Gross Profit Margin

- $(\text{Gross Profit} / \text{Net Sales}) \times 100$

This value measures the percent of money your company generated over the cost of producing your goods or services. In other words, gross profit margin (or percent) is the ratio of your net sales (gross sales minus your cost of goods sold) divided by your gross sales, expressed as a percentage. You can do very well here when you really understand the value your product or service bring to your customers – your prices need not be built upon your costs. Better to determine the *real value to your customers* and sell them on that. This way you will enjoy higher gross margins.

Operating Profit Margin (Return On Sales - ROS)

- $((\text{Gross Profit} - \text{Operating Expenses}) / \text{Sales}) \times 100$

This value measures the percent of revenue remaining after paying all operating expenses (Operating Income). The operating profit margin is your operating income (gross profit minus all operating expenses) divided by your gross sales expressed as a percentage.

Net Profit Margin

- $\text{Net Income (After Tax)} / \text{Net Sales}$

This is the profit you made on this business. The net income divided by your gross sales, expressed as a percentage. Your company’s after-tax profit margin tells you (and investors) the percentage of money your company actually earns per dollar of sales. Interpretation is similar to your profit margin, the after-tax profit margin is more stringent as it takes into account taxes. Looking at the earnings of a company often doesn’t tell the entire story... Profit can increase, but it does not mean that its profit margin is improving. For example, if your company increases sales, and if costs also rise, you’ll have a lower profit margin than had been seen with a lower profit. This indicates that costs need to be better controlled.

All three of these above percentages should usually be included on your income statements. To analyze your profitability, compare these percentages to your industry’s averages or those of your immediate competitors (if you can obtain this information). Of course, you’ll always want to compare your current year’s profitability percentages to the percentages from your company’s previous years in order to

determine how well you are progressing.

EBITDA

- Earnings Before Interest, Tax, Depreciation & Amortization

This is what your business really generates – often referred to by investors as a reality-check because it is separate from your loan payments, tax situation, asset history, etc. – all things they can/could do differently. EBITDA is used to compare the profitability between companies and industries, because it eliminates the effects of financing and accounting decisions.

Operating Cash Flow

- Cash from Operations / Current Liabilities

Your operating cash flow ratio can measure your company's liquidity in the short term—a measure of how well your current liabilities are covered by your company's operations. Using cash flow as opposed to income is often a better indication of liquidity simply because cash is what is required to pay bills.

Operating Ratio

- Operating Expense / Net Sales

This ratio shows management efficiency by comparing your operating expenses to your net sales. The smaller the ratio, the greater your company's ability to generate a profit if revenue decreases. This ratio; however, does not take into account any debt repayment or debt increase.

Sales / Day (000)

- Shows Average Sales per Day

(244 business days) Assists in the evaluation of management performance.

Marketing Efficiency

- Sales / Cost of Marketing + Sales
- Return on Marketing: Operating Profit / (Costs of Marketing + Sales)

This is a unique ratio in BizPlanBuilder, and something worth measuring in the future. It gives an indication of the efficiencies of your marketing campaigns. How much money are you investing in marketing compared to the sales it generates? What is your ROI on marketing? It should go up if your marketing is becoming more and more effective.

Sales / Employee (000)

Income from Operations / Employee (000)

Net Income After Taxes / Employee (000)

Are you using your employees effectively? Compare these figures with others in your industry. Ideally, your company wants the highest revenue per employee possible, as it means higher productivity. When I advised a company in trouble, I asked the CEO to draw his org chart on the board. Then I asked him to tell me what each person did and why they were important. (Don't expect this process to be comfortable.) It turned out, among other things, that 80% of his sales came from just 10 stores... how many salespeople did he require to manage 10 stores? A few red 'X's on your org chart may be a healthy thing.

Leverage Ratios

Leverage ratios help you evaluate your business' liabilities. Debt is associated with risk, so the more debt you have the higher the rate of return that will be expected. Highly leverage firms (those with heavy debt relative to net worth) are more vulnerable to business downturns than those businesses with lower debt to worth positions. If your liabilities are large compared to your equity or your assets, potential lenders and investors may feel you are already too indebted and your business is not a good investment risk.

Interest Coverage

- EBITDA / Interest Expense

Indicates what portion of debt interest is covered by your company's cash flow situation. A ratio below 1 means that your company is having problems generating enough cash-flow to pay its interest expenses. Ideally you want the ratio to be over 1.5.

Debt to Owners' Equity

- Total Liabilities / (Net Worth - Intangible Assets)

Also called Debt to Worth, this ratio compares the total liabilities of your business to your total owners' equity or net worth (the value of your total assets minus your total liabilities from your balance sheet). It indicates what proportion of equity and debt your company is using to finance assets. Also, it expresses a degree of protection provided by owners for creditors. Low indicates greater long-term financial safety and/or flexibility to borrow.

Total Debt to Total Assets

- Debt / Assets

Measures the leverage of your assets – what you owe on your assets. This is your total liabilities divided by your total assets (from your balance sheet). Unlike your current ratio, this compares all of your assets and all of your liabilities; in other words, it shows the ratio of what you owe to what you own.

Profitability Ratios

One of the primary reasons for operating most businesses is to generate profits. If you have outside investors, the return on their investment often comes from the net income the business generates (rather than from the sale of the business or some other form of pay back). There are many ways to measure Return on Investment (ROI). Return on Equity and Return on Assets, as shown below, are two easily calculated methods.

Return on Owners' Equity

- $(\text{Profit Before Tax} / \text{Tangible Net Worth}) \times 100$

This ratio compares the net profit of your business to the equity (net worth) of your business. It expresses rate of return on capital employed. It is calculated as net income after taxes (from your income statement) divided by total owner's equity (from your balance sheet). High could mean effective management or undercapitalization. Low could mean ineffective management or high capitalization.

Total Debt to Owners' Equity

The debt to equity ratio is a common benchmark used to measure the leverage within a business. To relate Return on Equity to the Debt-to-Worth ratio, you need to remember that given a fixed total asset figure, the greater the debt, the lower the net worth. Therefore, given two companies of identical asset size and profitability, the company with the higher debt to worth ratio will also have a higher return on equity ratio. When potential lenders and investors consider the risks of investing in your business, they will look at your return on equity ratio. If the ratio is the same as lower risk investments such as certificates of deposit or US Treasury bills, it does not make sense for them to invest in your company.

Asset Management (Efficiency)

Liabilities to Assets

- $\text{Total Liabilities} / \text{Total Assets}$

Liabilities are claims on your company's assets by your creditors (the amount owed for interest, accounts payable, short-term loans, expenses incurred but unpaid, and other debts due within one year) – what percentage of your assets are owned by creditors?

Debt to Assets

- $\text{Total Debt} / \text{Total Assets}$

Percentage of your overall debt compared to your assets. A ratio below 1 means the majority of assets are financed through equity, above 1 means they are financed more by debt. You can interpret a high ratio as a “highly debt-leveraged firm.”

Debt to Capitalization

- $\text{Total Debt} / (\text{Long-Term Debt} + \text{Preferred Stock} + \text{Common Stock})$

A variation of the debt-to-equity ratio, this value computes the proportion of your company's long-term debt compared to your available capital. Investors use this ratio identify to amount of your leverage and compare it to others to help analyze your company's risk exposure. Generally, companies who finance a greater portion of their capital via debt are considered riskier than those with lower leverage ratios.

Return On Assets (ROA)

- Net income / Total Assets

This is a very useful indicator of how profitable your company is relative to your total assets. This is calculated as your net income after taxes (from your income statement) divided by your total assets (from your balance sheet). Assets are used to generate profits; the return on total assets is therefore a measure of how effectively you are employing the invested capital (assets) of your business for generating profits. ROA is displayed as a percentage. Sometimes ROA is referred to as “Return on Investment.”

Assets Turnover

- Net Sales / Net Assets

This ratio measures your productive use of your fixed assets—the amount of sales generated for every dollar's worth of assets. It is calculated by dividing sales in dollars by assets in dollars. Asset turnover measures your company's efficiency at using its assets in generating sales or revenue; the higher the number the better. It also indicates pricing strategy: companies with low profit margins tend to have high asset turnover; those with high profit margins have low asset turnover. Largely depreciated fixed assets or a labor-intensive operation may distort this ratio.

Return on Equity (ROE)

- Net Income / Shareholder Equity

Basically, ROE shows how much profit your company generates from a given level of shareholder investment. The ROE is useful for comparing the profitability of your company to that of other firms in your industry. ROE may also be calculated by dividing net income by *average* shareholders' equity. Calculate by adding the shareholders' equity at the beginning of the period to shareholders' equity at the end of the period, then divide by two. You may also want to calculate the change in ROE for a period, first by using shareholders' equity at the start of the period as the denominator and then using shareholders' equity at the end of the period as the denominator. Calculating both beginning and ending ROE enables you to determine the change in profitability over the period.



➤ **NOTE:** *Each industry and each business will have a set of ratios that are especially helpful to it. The point to remember is that ratios are a comparison of two numbers. So if you find a ratio that is helpful to you in the financial management of your firm, by all means use it.*

Standard ratio values for many industries are available from on-line database services, from organizations that collect financial data (such as BizStats, Dun & Bradstreet and Robert Morris Associates (RMA)), and from various reference books available at most libraries. Other ratios, often made up to suit a particular business can be useful as “Key Indicators.”

Other Key Performance Indicators

I used to work for the Sharper Image Catalog. One thing they did was to add up all of their expenses—everything—for the entire year, then divide by the number of catalog pages they printed. Let's say their total annual expenses were \$30 million and they printed 6 catalogs with 64 pages in each... \$30 million divided by $6 \times 64 = \$78,215$ cost per page. If you ran this catalog company, you would now know that you needed to earn something north of \$80,000 (+ profit margin) on each page. If we "invested" a quarter of a page for one product, we knew we were invested nearly \$20,000 in its promotion. Now, the idea is to come up with a few of your own "key indicators." Think simple. Sales/profit per employee. Revenue/profit per truckload. Test-tube usage per month, etc.

Percentage Analysis

Because of the standard procedures accountants follow, you can compare your company's performance to other companies in your industry, and to your own business' performance over time. Although a direct dollar-for-dollar comparison can be impractical, percentage comparisons are very useful.

Percentage analysis of your income statement focuses on how your gross profit, expenses, and net income relate to your gross sales. As sales grow or decline over the years, your expenses should also grow, which makes a direct dollar-for-dollar comparison impractical. However, the expenses should remain relatively stable as a percentage of sales, thus enabling your comparison.

Percentage comparisons can also be done on your balance sheet to see how each item relates to your total assets. To calculate your balance sheet percentages, the individual accounts, including the liability and equity accounts, are divided by the total asset figure. Now you can compare your company's performance to other companies in your industry and to your historical performance.

Industry Averages

As mentioned above, you can compare your business' ratios with the averages for your industry to evaluate your business' financial health. Industry averages can usually be obtained from industry associations, and from industry surveys and averages published by BizStats, Standard & Poor's, Moody's, and Robert Morris Associates (RMA), among others. These agencies solicit financial statements from numerous companies in a wide variety of industries. They compile these statements by industry and size to establish industry averages.

It is important to note that these are averages compiled from companies around the country in various economic environments. As such, they do not necessarily present a reliable comparison. You should use these averages only as a broad guideline to compare your company's performance.

You can learn more about ratios and financing terms & definitions at [Investopedia](https://www.investopedia.com)