
how to analyze profitability

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how to analyze profitability

Although pride of ownership and career satisfaction are healthy goals, generating profit is the most likely reason you started your business. This guide introduces you to several methods for analyzing your company's operations and calculating the profitability of your business.

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what to expect

Many entrepreneurs start their business, at least in part, because of pride of ownership and the satisfaction that comes from being their own boss. In addition, of course, you almost certainly started your business to generate profits. This Business Builder will introduce you to several methods that will help you analyze your company's operations and compute the profitability of your business.

Among the tools to which you will be introduced are profitability ratios, break-even analysis, return on assets and return on investment.

Some of these concepts, and some of the vocabulary we will use to describe them, may be new to you. We've tried to explain the terminology and concepts as they are introduced, and where appropriate, directed you to additional sources of information.

what you should know before getting started

There are several ways to measure your company's profits other than just looking at your bank account which, to tell the truth, doesn't tell you much about profitability. The techniques being introduced in the following pages detail three methods of analyzing how well your company is doing:

- Margin (or profitability) ratios
- Break-even analysis (based on revenues and on units sold)
- Return on assets and on investment

Before you get started, you or your bookkeeper should have prepared an income (or profit and loss) statement for your business. The techniques to which we will be introducing you on the following pages are intended to make your income statement more understandable and meaningful for you. If an income statement has not been prepared, the following information on constructing a common size income statement will not be of much relevance, and the data you need for break-even analysis may be missing.

This guide looks at several aspects of financial ratio analysis. In case your math is a bit rusty, a ratio is simply a comparison between two numbers. If a basketball team has won six games and lost three, its ratio of wins to losses is six to three, which is equivalent to a ratio of two to one. If another team has won eight games and lost four, it also has a win/loss ratio of two to one. In the business

arena, the most commonly used kind of financial ratios are various comparisons of two numbers from a company's financial statements, such as the ratio of net income to annual sales.

A ratio can be written in several different ways:

2:1 2-to-1 2/1 2

In these pages, when a ratio is in the text, it will be written out using the word "to," as in "two to one." If it is in a formula, the slash sign (/) will be used to indicate division, as in "2/1."

profitability ratios

The use of financial ratios is a time-tested method of analyzing a business. Wall Street investment firms, bank loan officers and knowledgeable business owners all use financial ratio analysis to learn more about a company's current financial health as well as its potential.

Here are the profitability ratios that small business owners should look at regularly:

- **Gross Profit Margin**
- **Operating Profit Margin**
- **Net Profit Margin**
- **Other Common Size Ratios**

There are several ways to measure your company's profits other than just looking at your bank account which, to tell the truth, doesn't tell you much about profitability.

Don't worry if some or even all of these terms are unfamiliar. We will define each of them as we go along and explain how you can best use them.

The three measurements of profit (gross profit, operating profit and net profit) all come from your company's income statement.

Here are several definitions you will need as we continue through this Business Builder:

Gross Profit = Net Sales - the Cost of Goods Sold

(Net sales = gross sales less any returns and discounts.)

Operating Profit = Gross Margin - Selling and Administrative Expenses

(Administrative Expenses = salaries, payroll taxes, benefits, rent, utilities, office supplies, insurance, depreciation, etc.) Operating profit includes all expenses except income taxes.

Net Profit = Operating Profit (plus any other income) - Additional Expenses - Taxes

(Net profit is what is known as "the bottom line.")

As you can see, each of these three terms is simply a way of expressing profit when different categories of expense are included. Gross profit is the difference between sales and the cost of goods sold. Operating profit is the difference between sales and the cost of goods sold plus selling and administrative expenses. And finally, net profit is the difference between net sales and all expenses, including income taxes.

The three ways of expressing profit can each be used to construct what are known as profitability ratios. This is done by dividing each item by net sales and expressing it as a percentage. For example, if your company had gross sales of \$1 million last year, and net profits were \$50,000, that's a ratio of 50,000/1,000,000 or 5%.

There are several reasons ratios are expressed as percentages. Ratios make it easy to compare your company's results at different time periods. Ratios also allow you to compare your company's results with those of your peers or competitors, and with industry "benchmark" ratios.

It's easier to discuss these ratios using actual numbers, so we've included the following income statement from a fictional company - From the Roots Up. We will use From the Roots Up's gross profit (item 3), operating profit (item 10) and net profit (item 13) numbers to compute the three profitability ratios.

From the Roots Up Income Statement

For the Quarter Ended December 31, 200X (In Thousands)

1. Sales	\$8,158
2. Cost of Sales/Revenues	4,895
3. Gross Profit	3,263
4. General & Administration Expense	367
5. Lease/Rent Expense	188
6. Personnel Expense	816
7. Bad Debt Expense	33
8. Operating Expense	1,468
9. Total Operating Expense	2,872
10. Net Operating Profit	391
11. Interest Expense	122
12. Total Other Income (Expenses)	(122)
13. Net Profit	\$269

Gross Profit Margin Ratio

Gross profit is what is left after the cost of goods sold have been subtracted from net sales. Cost of goods sold, also called “cost of sales,” is the price paid by your company for the products it sold during the period you are considering. It is the price of the goods, including inventory or raw materials and labor used in production, but it does not include selling or administrative expenses.

Your company's gross margin is a very important measure of profitability, because it looks at your company's major inflows and outflows of money.

The ratio of gross profit as a percentage of sales is an important indicator of your company's financial health. Without an adequate gross margin, a company will be unable to pay its operating and other expenses and build for the future.

Here is the formula to compute the gross profit margin ratio:

Gross Profit Margin Ratio = Gross Profit / Sales x 100%

(Multiplying by 100 converts the ratio into a percentage.)

Let's use the income statement data for From the Roots Up and compute the gross margin ratio for the company.

From the Roots Up gross margin ratio:

$$\text{\$3,263,000} / \text{\$8,158,000} = .40$$

$$.40 \times 100\% = 40\%$$

The gross profit margin ratio for From the Roots Up is 40%.

Your company's gross margin is a very important measure of its profitability, because it looks at your company's major inflows and outflows of money: sales (money in) and the cost of goods sold (money out). It is a real measure of profitability, because it must be high enough to cover costs and provide for profits. Because it is an important barometer, you should monitor it closely.

In general, your company's gross profit margin ratio should be stable. It should not fluctuate much from one period to another, unless the industry your company is in is undergoing changes which affects the cost of goods sold or your pricing policies. The gross margin is likely to change whenever prices or costs change.



Operating Profit Margin

The operating profit margin is an indicator of your company's earning power from its current operations. This is the core source of your company's cash flow, and an increase in the operating profit margin from one period to the next is considered a sign of a healthy, growing company. If your company's operating income is not sufficient to generate the cash you need to keep operating, you must find other sources of cash.

Here is the formula to compute the operating profit margin ratio:

$$\text{Operating Profit Margin} = \text{Operating Profit} / \text{Sales} \times 100\%$$

Using the income statement data for From the Roots Up, we can compute the following operating profit margin:

From the Roots Up operating profit margin ratio:

$$\$391,000 / \$8,158,000 = .048$$

$$.048 \times 100\% = 4.8\%$$

The operating profit margin ratio for From the Roots Up is 4.8%.

In general, the operating profit margin is an indicator of management skill and operating efficiency. It measures your company's ability to turn sales into pre-tax profits. It is a ratio that you can use to compare your company's competitive position to others in the same industry.

Because it looks at a company's operating income before taxes are subtracted, the operating profit margin is sometimes considered a more objective evaluator than the net profit margin ratio.

Net Profit Margin Ratio

The formula for the net profit margin ratio is as follows:

$$\text{Net Profit Margin Ratio} = \text{Net Profit} / \text{Sales} \times 100\%$$

From the Roots Up net profit margin ratio:

$$\$269,000 / \$8,158,000 = .033$$

$$.033 \times 100\% = 3.3\%$$

The net profit operating margin ratio is 3.3%.

Now you know how to calculate the gross profit margin ratio, the operating profit ratio, the net profit margin ratio and why they are used. Take a break from reading this guide and calculate these ratios for your own company.

Other Common Size Ratios

While the calculation and evaluation of the gross profit margin ratio, the operating profit ratio, and the net profit margin ratio are important, there are many other helpful tools you can use to get real information from the data in your company's income statement.

One of the most useful ways for the owner of a small business to look at the items listed on the income statement is to see how each one relates to sales. This is done by constructing "common size" ratios for the entire income statement. The phrase "common size ratio" is simple in concept and just as simple to create. You calculate each line item on the income statement as a percentage of total sales. (Divide each line item by total sales, then multiply each one by 100 to turn it into a percentage.)

For example, cost of goods sold for From the Roots Up were \$4,895,000, while sales were \$8,158,000. So, the common size ratio for cost of goods sold was $\$4,895,000/\$8,158,000$, or .60. Multiplied by 100%, is 60%.

Here is what a common size income statement looks like for From the Roots Up:

From the Roots Up Common Size Income Statement

For the Quarter Ended December 31, 200X (In Thousands)

Sales/Revenues	\$8,158	100%
Cost of Sales/Revenues	4,895	60%
Gross Profit	3,263	40%
General & Administrative Expenses	367	4.5%
Lease/Rent Expense	188	2.3%
Personnel Expense	816	10%
Bad Debt Expense	33	0.4%
Operating Expense	1,468	18%
Total Operating Expense	2,872	35.2%
Net Operating Profit	391	4.8%
Interest Expense	122	1.5%
Total Other Income (Expenses)	(122)	(1.5%)
Net Profit	\$269	3.3%

Once operating income and expense data are turned into percentages of sales, you can begin to analyze the profitability of your company more effectively. Look back over the past several periods (years, quarters or months, whatever is appropriate) and you may spot changes in the size of some line items' ratios that reflect problems that need fixing or progress that can be enhanced.

It is also very useful to compare your company's common size ratios to those of your competitors, or to peers in your industry. Privately held companies won't let you see their financial statements, but several organizations publish almanacs of key business ratios. These are listed in the Resources section at the end of this manual. Your accountant or banker may have access to these or other compilations of ratios for your industry.

Common size ratios allow you to begin to make knowledgeable comparisons with past financial statements for your own company and to assess trends, both positive and negative, in your financial statements. They can also be highly informative when you compare them with the ratios of other companies in your industry.

Owners and managers should carefully watch the three most important profitability ratios: gross profit, operating profit and net profit. The value of the other ratios calculated from the income statement will vary depending on the specific line item and the type of business.

One of the most effective way for you to use common size ratios as a management tool is to prepare them on a regular basis (at least quarterly, and monthly is better) and compare the ratios from one period to another. If you put them side by side in a computer spreadsheet, you can easily spot significant positive or negative changes.

Compute the common size ratios for your company. Which ratios do you think are the most important? What line

Owners and managers should carefully watch the three most important profitability ratios: gross profit, operating profit and net profit.

items on your income statement are most significant to you, or cause you most concern? How do your company's ratios compare with others in your industry?

For more help understanding these ratios, read the Business Builder titled "How to Analyze Your Business Using Financial Ratios."

break-even analysis

What is Break-Even Analysis?

The term "break-even analysis" is another phrase which may seem complex, but the concept behind it is actually quite simple.

Break-even is the point at which revenues equal expenses. Until your company reaches break-even, you are generating red ink; your costs for materials, labor, rent and other expenses are greater than your gross revenues. Once you pass the break-even point, revenues exceed expenses. After break-even, a portion of each dollar of sales contributes to profits. It is only when you pass break-even that profits begin to be generated.

Break-even analysis is a simple, but effective tool you can use to evaluate the relationship between sales volume, product costs and revenue. It is certainly useful for you to calculate your company's current break-even point. If your company is profitable you may want to know how much breathing room you have should revenues take a dip. If your company is losing money, knowing the break-even point will tell you how far you are from beginning to turn a profit.

In addition to evaluating your present situation, you can, and should, use break-even analysis for profit planning. We will show you how to calculate a break-even point both for sales and for units sold.

Break-Even Analysis For Sales

To calculate the sales break-even point for your business you should have (or be able to estimate) three pieces of information about your business:

- Fixed expenses
- Variable expenses (expressed as a percentage of sales)
- Sales

Using just these three pieces of data, you can perform a break-even analysis for your company.

Before we do that, however, let's quickly review the concepts of fixed and variable expenses.

Expenses which are defined as "fixed" do not vary with sales, but variable expenses, on the other hand, do vary with sales. Fixed expenses are the day-to-day expenses that your business will incur regardless of how sales volume is increasing or decreasing. Some examples of fixed expenses include overhead, administrative costs, rent, salaries, office expenses and depreciation.

Variable costs are categorized differently. Let's say your company makes paper clips by cutting and bending pieces of wire. As you sell more paper clips, you have to buy more wire. The expense for wire varies with your sales. Typical variable expenses include the cost of goods sold (as shown on the income statement) and variable labor costs (like overtime wages or salaries for sales personnel). Variable expenses will increase and decrease according to sales volume.

Make the best guess you can to divide expenses into the categories of fixed and variable. There are no hard and fast rules for the allocations; it is up to you and your knowledge of the business.

Once you have the fixed expenses, variable expenses and sales you can plug that information into the following formula for calculating your company's break-even point.

Sales at the Break-Even Point = Fixed Expenses + Variable Expenses

(expressed as a % of sales)

or

$$\mathbf{S = f + v}$$

As you can see from the formula, sales at the break-even point are equal to expenses. At the break-even point no profits have yet been recorded, but the next sales dollar will contribute to profits.

Here is how the owners of From the Roots Up would calculate the break-even point for their business, using data taken from the income statement. Their first decision is to separate fixed costs from variable costs. The only variable cost for From the Roots Up is the cost of goods sold. Selling, general, and administrative expenses are all fixed costs. For your company, the data may not break out so evenly. Just divide fixed and variable costs to the best of your ability.

For From the Roots Up, the formula Sales at the Break-Even Point = Fixed Expenses + Variable Expenses (expressed as a % of sales) translates into the following:

$$\mathbf{\text{Sales at the Break-Even Point} = \$2,839,000 + .60S}$$

Break-even analysis is a simple, but effective tool you can use to evaluate the relationship between sales volume, product costs and revenue.

Fixed expense of \$2,839,000 is calculated based on data from the From the Roots Up income statement: General and Administrative Expense = \$367,000; Rent Expense = \$188,000; Personnel Expense = \$816,000; Operating Expense = \$1,468,000. These expenses total \$2,839,000.

Variable expense for From the Roots Up is the cost of goods sold as a percentage of sales. Looking at the From the Roots Up common size income statement, we see that the cost of goods sold is \$4,895,000, or .60 of sales.

A current ratio can be improved by increasing current assets or by decreasing current liabilities.

Now we can solve the equation:

$$S = \$2,839,000 + .60S$$

(Where "S" stands for "Sales at the Break-Even Point.")

Move the ".60S" to the other side of the equal sign. Remember, it becomes a negative .60S when you move it to the other side of the equation. So now we have, on one side of the equation, 1S minus .60S, as shown below:

$$1S - .60S = \$2,839,000$$

or

$$.40S = \$2,839,000$$

Now we can easily solve for S by dividing .40S into \$2,839,000.

$$S = \$7,097,500$$

From the Roots Up is at its break-even point when sales total \$7,097,500. The next dollar of sales will include some profit.

Calculate the Sales Break-Even Point for your business.

Using Break-Even Analysis for Profit Planning

Now that you understand how to calculate the break-even point, by making one small adjustment to the break-even analysis formula you can do some "what if" planning about profitability. After all, you don't want to just know where you are today in terms of break-even, you certainly want to know how to attain a given amount of profit.

You can easily calculate the amount of sales necessary for a desired amount of net income before taxes. Revise the formula slightly by adding the amount of net income you want your company to earn, as follows:

Sales at the Break-Even Point = Fixed Expenses + Variable Expenses as a Percentage of Sales + Desired Net Income.

Let's say the owners of From the Roots Up have a goal of \$300,000 in net income before taxes, and want to know what level of sales will be required to generate that net income. Make the following calculation:

$$\text{Sales at the Break-Even Point} = \$2,839,000 + .60S + 300,000$$

We solve the formula in these steps:

$$S = \$2,839,000 + .60S + \$300,000$$

$$S = \$3,139,000 + .60S$$

$$1S - .60S = \$3,139,000$$

$$.40S = \$3,139,000$$

$$S = \$7,847,500$$

From the Roots Up must generate sales of \$7,847,500 to produce a net income before taxes of \$300,000.

Use Break-Even Analysis to calculate a specified amount of net income for your business.

Break-Even Analysis for Units Sold

Depending on the type of business, it may be useful to calculate break-even in terms of the number of units sold as well by revenues. In other words, you want to know the number of units which must be sold to reach the break-even point. This can be calculated using this formula:

Break-Even for Units to be Sold = Fixed Expenses / (Unit Sales Price - Unit Variable Expenses)

This formula needs two new bits of information: the unit sales price and the unit variable expense.

If you know the sales price for your company's products, you can compute the unit variable expense, using the variable expense as a percentage of sales. We developed that figure earlier in this guide. Let's assume that From the Roots Up has a cost of \$20 per unit.

For From the Roots Up, the variable expense was .60. So the unit variable sales expense is \$20 multiplied by .60, which equals \$12. This means that each unit has a variable cost of \$12.

Plugging the data into the formula, it looks like this:

$$S = \text{Break-Even for Units to be Sold}$$

$$S = \$2,389,000 / (\$20 - \$12)$$

$$S = \$2,389,000 / 8$$

$$S = 289,625$$

From the Roots Up must sell 289,625 units to break even. If it sells just the 289,625, it is not yet generating any profits. Part of the revenue on the 289,626th unit will go to profit.

If appropriate for your business, calculate the number of units that must be sold to reach the break-even point.

calculating return on assets and return on investment

Return on Assets

You use the return on assets ratio to measure the relationship between the profits your company generates and assets that are being used. Compute it using data from both the income statement and the balance sheet.

Let's use an abridged From the Roots Up balance sheet to see how these ratios are calculated and used:

From the Roots Up Balance Sheet

For the Year Ending December 31, 200X (In Thousands)

Assets

Current Assets	\$2,463
Fixed Assets	510
Total Assets	2,973

Liabilities

Current Liabilities	773
Long-term Liabilities	850
Owner's Equity (Net Worth)	1,350
Total Liabilities and Equity	\$2,973

The formula for computing return on assets is as follows:

Return on Assets = Net Profit Before Taxes / Total Assets x 100

(Multiplying by 100 converts the ratio into a percentage.)

From the Roots Up Return on Assets:

$$(\$269,000 / \$2,973,000) \times 100 = 9.05\%$$

This ratio is useful when you compare the figure for the most recent period with results from earlier periods in your company's history. It can also be very informative when you compare your company's return on assets with the returns generated by other businesses in your industry.

If your company's return on assets ratio is lower than those of other companies, this may indicate that your competitors have found ways to operate more efficiently. If your company's current return on assets is lower than it was a year ago, you should look at what has changed in the way your company is using its resources.

Return on Investment

Return on investment is considered to be the most important profitability ratio by many executives. It measures the return on the owner's investment. For you as a small business owner, the return on investment figure can help you decide whether all of your hard work has been worth it. If the return you are receiving on the money invested in your company does not at least equal the return you would receive from a risk-free investment (such as a bank CD), this could be a red flag.

Here is the formula:

Return on Investment = Net Profit Before Taxes / Net Worth

Return on Investment for From the Roots Up:

$$\$269,000 / 1,350,000 = .199$$

From the Roots Up return on investment = 19%.

Calculate the return on assets and return on investment for your company. Compare them to at least one source of compiled financial ratios (as noted in the Resources section). How do your ratios compare to others in your industry?

checklist

This guide has introduced several different methods of evaluating profitability. Used alone or in combination, they can give a small business owner a good picture of the financial viability of his or her business.

As a management tool, objective profitability measures such as the ones shown here are invaluable tools for financial management. They are also important to the small business owner because these common profitability measures will be used by others, such as bank loan officers, investors, or merger and acquisition specialists to evaluate the management skill and potential for success of a company.

Profitability Ratios

- Has your gross profit margin been stable over the last few periods? If not, why?
- What common size ratios are most important to your business?
- Did you consult at least one source of compiled financial ratios to evaluate how your ratios compare to others in your industry?

Break-Even Analysis

- Did you include depreciation and overhead as fixed costs?
- Do all the variable costs you listed truly vary with sales volume?

Return on Assets and Return on Investment

- When you calculated return on assets and return on investment, did you use net profit before tax?
- Is your company producing a return on investment that's acceptable to you, given the resources employed and the rates of interest you could earn on alternative investments?

resources

Books and Websites

Zions Business Resource Center, www.resources.zionsbank.com

Healthy Business Guide, Zions First National Bank

Edward Lowe Foundation, www.edwardlowe.org

Sources of Information on Profitability Analysis

How to Read and Interpret Financial Statements. American Management Association, 1992.

Budgeting and Finance (First Books for Business) by Peter Engel. (McGraw-Hill, 1996).

The Credit Process: A Guide for Small Business Owners by Tracy L. Penwell. (Federal Reserve Bank of New York, 1994).

Sources of Information on Financial Ratios

RMA Annual Statement Studies. RMA The Risk Management Association. Data for 325 lines of business, sorted by asset size and by sales volume to allow comparisons to companies of similar size in the same industry. The "common size" (percentage of total assets or sales) is provided for each balance sheet and income statement item.

Almanac of Business and Industrial Financial Ratios, annual, by Leo Troy. (Prentice-Hall, Inc.) Information for 150 industries on 22 financial categories. Data is usually three years prior to the publication date.

Financial Studies of the Small Business by Karen Goodman. (Financial Research Associates.) Focusing on business with capitalizations under \$1 million, providing financial ratios and other information.

Industriscope: Comprehensive Data for Industry Analysis. (Media General Financial Services.) Compare company-to-company, company-to-industry & industry-to-industry; 215 industry groups; over 9,000 companies grouped within their industry; over 40 key items listed on each company & industry; price, price change & relative price data; shareholdings data; revenue, earnings & dividend data; ratio analysis; historical archives available back to May 1973.

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