

How to Analyze Profitability

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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 also started your business to generate profits. This training guide 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. But we've tried to explain the terminology and concepts as they are introduced. Where appropriate, we've pointed you to additional sources of information.

WHAT YOU SHOULD KNOW BEFORE GETTING STARTED

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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.) In the following pages we will introduce you to 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

Watch Out For... 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 information below 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 high school 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 [[top](#)]

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

- Gross Profit Margin Ratio.
- Operating Profit Margin Ratio.
- Net Profit Margin Ratio.
- Other Common Size Ratios

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

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

As a reminder, here is a definition of gross profit, operating profit and net profit. (As you will see, the definitions build on one another, reflecting the way net sales are affected by increasing expense components.)

Gross profit = Net sales minus the costs of goods sold.

(As a reminder — Net sales = gross sales less any returns and discounts.)

Operating profit = Gross margin minus 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)
minus any additional expenses and minus 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 costs of goods sold. Operating profit is the difference between sales and the costs 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 that ratios are expressed as percentages. This makes it easy to compare your company's results at different time periods. It also allows you to compare your company's results with those of your peers or competitors, and with industry "benchmark" ratios (which will be discussed in more detail below.)

It's easier to discuss these ratios using actual numbers, so we've included the following income statement for the fictional Doobie Company. Look at line numbers 3, 9, and 14. We will use the Doobie Company's gross profit (line 3), operating Income (line 9) and net income (line 14) numbers to compute the three profitability ratios.

**Doobie Company Income Statement
for the period ending December 31, 200x**

Item	\$\$
1. Sales	\$200,000
2. Cost of goods sold	130,000
3. Gross Profit	70,000
4. Operating expenses:	
5. Selling expenses	22,000
6. General expenses	10,000
7. Administrative expenses	4,000
8. Total operating expenses	36,000
9. Operating income	34,000
10. Other income	2,500
11. Interest expense	500

12. Income before taxes	36,000
13. Income taxes	1,800
14. Net profit	34,200

Gross Profit Margin Ratio

Gross profit is what is left after the costs 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 looking at. 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.)

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:

$$\text{Gross profit margin ratio} = \text{Gross profit/sales} \times 100\%$$

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

Let's use the income statement data for the fictitious Doobie Company and compute the gross margin ratio for the company:

Doobie Company Gross Margin Ratio:

$$\$70,000/200,000 = .35$$

$$.35 \times 100\% = 35\%$$

The gross profit margin ratio for the Doobie Company is 35%.

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 costs 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 affect the costs 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:

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

Using the income statement data for the Doobie Company, we can compute the following operating profit margin:

Doobie Company Operating Profit Margin Ratio:

$$\$34,000/200,000 = .17$$

$$.17 \times 100\% = 17\%$$

The operating profit margin ratio for the Doobie Company is 17%.

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. (However, as you will see, this is not true for the Doobie Company. Given the small amount paid in taxes, the gross profit margin and the net profit margin ratios are nearly identical.)

Net Profit Margin Ratio

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

- **Net Profit Margin Ratio = Net Income/Sales x 100%**

Doobie Company Net Profit Margin Ratio:

$$\$34,200/200,000 = .17$$

$$.17 \times 100\% = 17\%$$

The net profit operating margin ratio is 17%.

Now that you know how to calculate the gross profit margin ratio, the operating profit ratio, and 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" may be unfamiliar to you, but it is simple in concept and just as simple to create. You just 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 at the Doobie Company were \$70,000, while sales were \$200,000. So the common size ratio for cost of goods sold was $70,000/200,000$, or .35. Multiplied by 100%, that's 35%.

Here is what a common size income statement looks like for the Doobie Company.

**Doobie Company
Common Size Income Statement
for the period ending December 31, 200x**

Sales	\$ 200,000	100%
Cost of goods sold	130,000	65%
Gross Profit	70,000	35%
<hr/>		
Operating expenses		
Selling expenses	22,000	11%
General expenses	10,000	5%
Administrative expenses	<u>4,000</u>	<u>2%</u>
Total operating expenses	36,000	18%
<hr/>		
Operating income	34,000	17%
Other income	2,500	1%
Total income	36,500	18%
<hr/>		
Interest expense	500	0%
Income before taxes	36,000	18%
Income taxes	1,800	1%
<i>Net income</i>	<i>34,200</i>	<i>17%</i>

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 soon 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 usefulness to you of the other ratios calculated from the income statement will vary depending on the specific line item and the type of business you are in.

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 most important? What line 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 [[top](#)]

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

Remember that 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, also 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 that are defined as "fixed" do not vary with sales. They 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 expenses, on the other hand, *do* vary with sales. 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 three pieces of information — fixed expenses, variable expenses, and sales — you can plug the 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

$$S = F + V$$

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 the Doobie Company would calculate the break-even point for their business, using data taken from the income statement above. Their first decision is to separate fixed costs from variable costs. The Doobie Company's only variable cost 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 the Doobie Company, the formula — **Sales at the break-even point = Fixed Expenses + Variable Expenses — expressed as a % of sales** — translates into the following:

$$\text{Sales at the break-even point} = 36,000 + .65S$$

(Fixed expense of 36,000 is calculated based on data from the Doobie Company's income statement: Selling expense = \$22,000, General expense = \$10,000, Administrative expense = \$4,000. These expenses total \$36,000.)

Variable expense for the Doobie Company is the cost of goods sold as a percentage of sales. Looking at the Doobie Company common size income statement, we see that the cost of goods sold is \$130,000, or .65 of sales.

Now we have to solve the equation

$$S = 36,000 + .65S$$

where "S" stands for "Sales at the break-even point."

Move the ".65S" to the other side of the equal sign. (As you may remember from algebra class, it becomes a negative .65S when you move it to the other side of the equation.) So now we have, on one side of the equation, 1S minus .65S, as shown below:

$$1S - .65S = 36,000$$

or

$$.35S = 36,000$$

Now we can easily solve for S (which here stands for "Sales at the break-even point") by dividing .35S into 36,000.

$$S = \$102,857$$

The Doobie Company is at its break-even point when sales total \$102,857. 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 we understand how to calculate the break-even point, we can make one small adjustment to the break-even analysis formula so we 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 almost certainly also 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. We just 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 the Doobie Company have a goal of, say, \$50,000 in net income before taxes, and want to know what level of sales will be required to generate that. They just make the following calculation:

$$\text{Sales at the break-even point} = 36,000 + .65S + 50,000$$

Using our handy high school algebra again, we solve the formula in these steps:

$$S = 36,000 + .65S + 50,000$$

$$S = 86,000 + .65S$$

$$1S - .65S = 86,000$$

$$35S = 86,000$$

$$S = 245,714$$

The Doobie Company must generate sales of \$245,714 to produce a net income before taxes of \$50,000.

Use break-even analysis to calculate a specified amount of net income for your business.

Break-Even Analysis for Units Sold

Depending on what kind of business you are in, it may be useful for you 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 that 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 divided by (Unit sales price minus 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 (for the Doobie Company it is \$20.00 per unit) you can compute the unit variable expense, using the variable expense as a percentage of sales; we developed that figure earlier in this guide.

For the Doobie Company, the variable expense was .65. So the unit variable sales expense is \$20 multiplied by .65, which equals \$13. What this means is that each unit has a variable cost of \$13.

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

Break-even for units to be sold = Fixed expenses divided by (Unit sales price minus Unit variable expenses)

Let S = Break-even for units to be sold

$$S = 36,000 / (20 - 13)$$

$$S = 36,000 / 7$$

$$S = 5,142$$

The Doobie Company must sell 5,142 units to break even. If it sells only 5,141, it is not yet generating any profits. On the 5,143d unit it sells, part of the revenue from the sale of that unit will contribute to profits.

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 [[top](#)]

The final two types of profitability analysis we will discuss in this manual are:

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. You compute it using data from both the income statement and the balance sheet.

Let's use an abridged balance sheet for the Doobie Company to see how these ratios are calculated and used:

Doobie Company Balance Sheet

For the year ending December 31, 200x

Assets

Current Assets	\$ 65,000
Fixed Assets	115,000
Total Assets	180,000

Liabilities

Current Liabilities	40,000
Long-term Liabilities	100,000
Owner's Equity	40,000
Total Liabilities and Assets	180,000

The formula for computing return on assets is as follows:

$$\text{Return on assets} = \text{Net income before taxes} / \text{Total assets} \times 100$$

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

Doobie Company's Return on Assets:

$$(36,000/180,000) \times 100 = 20\%$$

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 by many executives to be the most important profitability ratio. It measures the return on the owner's investment (or owners', if there are more than one.) 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:

$$\text{Return on investment} = \text{Net profit before Tax} / \text{Net worth}$$

Return on Investment for the Doobie Company:

$$36,000/40,000 = .90$$

Doobie Company return on investment = 90%.

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 below.) How do your ratios compare to others in your industry?

CHECKLIST [[top](#)]

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 outsiders, such as bank loan officers, investors, and, even, 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 [[top](#)]

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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About This Item

Category: Financial Management

Subcategory: Ratio Analysis

Keywords: Income Statements, Operating Ratios, Profit & Loss Statement (P&L Statement), Profitability, Ratio Analysis

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The Edward Lowe Foundation was created by Ed and Darlene Lowe in 1985 to "champion the entrepreneurial spirit." Headquartered near Cassopolis, Michigan, the foundation works with entrepreneur support organizations nationwide to encourage peer learning among second-stage business owners. Before his death in 1995, Ed Lowe, the creator of Kitty Litter, had become an advocate for entrepreneurship as the key to the success of the free-enterprise system.

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