

# Break-Even

From "Know Your Numbers,  
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Break-Even is when you have zero profit or loss. Understanding this and being able to calculate Sales required to get to break-even will *help you to determine how much in sales you need to cover increases in expenses.*

**Break-even analysis** is a crucial financial concept used to determine the point at which a business neither makes a profit nor incurs a loss. It's a valuable tool for understanding the financial viability of a product, project, or business endeavor. Break-even analysis is primarily associated with cost and revenue information and is typically used to make informed decisions about pricing, production, and overall business strategy.

**Break-Even Point:** The break-even point is the level of sales or revenue at which total costs (both fixed and variable) are exactly equal to total revenue, resulting in zero profit or loss. In other words, it's the level of output or sales volume where a business covers all its expenses but doesn't generate any profit.

## Key Components for Break-Even Analysis:

- **Fixed Costs (FC):** Fixed costs are expenses that remain constant regardless of the level of production or sales. They include items like rent, salaries, insurance, and depreciation. Fixed costs do not change with fluctuations in production or sales volume.
- **Variable Costs (VC):** Variable costs are expenses that vary in direct proportion to changes in production or sales volume. Examples include raw materials, labor directly tied to production, and commissions on sales.
- **Total Costs (TC):** Total costs are the sum of fixed and variable costs. It represents the total expenses incurred by a business at a given level of production or sales.
- **Total Revenue (TR):** Total revenue is the income generated from selling products or services. It is calculated by multiplying the selling price per unit by the number of units sold.

The calculation is:

Fixed Costs divided by Gross Profit Margin percentage equals Break-Even.

$$\text{FC/Gross Profit Margin \%} = \text{BE}$$

## Total Operating Expenses are the Fixed Costs.

Here are key points about operating expenses:

### 1. Nature of Operating Expenses:

- **Routine Costs:** Operating expenses are regular, recurring costs that a business faces in its normal course of operations.
- **Non-Production Costs:** Unlike the cost of goods sold (COGS), which represents the direct costs of producing goods or services, operating expenses relate to the supporting activities necessary to keep the business running.

## 2. Types of Operating Expenses:

- Examples: Common operating expenses include salaries and wages, rent, utilities, insurance, office supplies, marketing and advertising expenses, maintenance costs, legal and accounting fees, and depreciation of assets used in operations.
- Variability: Operating expenses can be categorized as either fixed (e.g., rent, salaries) or variable (e.g., utilities, office supplies). Fixed expenses remain relatively constant, while variable expenses may fluctuate with changes in business activity.

## 3. Importance of Operating Expenses:

- Profitability Assessment: Operating expenses are subtracted from a company's revenue on the income statement to calculate operating profit (also known as operating income or EBIT - earnings before interest and taxes).
- Investor and Lender Analysis: Investors, lenders, and analysts closely examine a company's operating expenses to assess its financial performance and sustainability. A significant increase in operating expenses without a corresponding increase in revenue can raise concerns.

## 4. Impact on Profitability:

- Operating Profit: Operating expenses have a direct impact on a company's operating profit. Higher expenses reduce operating profit, while lower expenses increase it.
- Net Profit: After accounting for interest, taxes, and non-operating items, operating profit contributes to a company's net profit, which is the bottom-line profit or net income.

## 5. Managing Operating Expenses:

- Cost Control: Effective management of operating expenses is vital for maximizing profitability. Businesses often seek ways to control and reduce operating costs without compromising quality or customer service.
- Budgeting: Budgeting and forecasting operating expenses help businesses plan for future financial needs and set performance goals.

## 6. Reporting and Analysis:

- Income Statement: Operating expenses are typically presented on a company's income statement, where they are deducted from total revenue to calculate operating profit.
- Trend Analysis: Companies analyze trends in their operating expenses over time to identify areas for improvement or cost-saving opportunities.

In summary, operating expenses encompass the ongoing costs associated with a business's regular operations. These expenses are crucial for assessing a company's financial performance, profitability, and sustainability. Effective management of operating expenses is essential for maintaining a healthy bottom line and achieving long-term success.

# Contribution Margin

Contribution margin is a financial metric that plays a key role in understanding the profitability of individual products, services, or business segments. It represents the portion of a company's revenue that is available to cover fixed costs and contribute to the company's net profit after covering variable costs. Contribution margin is a valuable tool for making pricing decisions, assessing product profitability, and guiding resource allocation. Here's a detailed explanation of contribution margin:

Contribution Margin Formula: The contribution margin is calculated using the following formula:

$$\text{Contribution Margin} = \text{Revenue} - \text{Variable Costs}$$

## 1. Understanding the components:

- a. Revenue: The top-line revenue represents the total income generated from sales.
- b. Variable Costs: These costs include expenses such as direct materials, direct labor, and variable overhead directly tied to the production or sale of a product or service.

## 2. Interpretation of Contribution Margin:

- a. Positive Contribution Margin: A positive contribution margin indicates that the product or service is generating more revenue than its variable costs, contributing to covering fixed costs and potentially generating profit.
- b. Negative Contribution Margin: A negative contribution margin means that the product or service's variable costs exceed its revenue, which can lead to losses that need to be covered by other products or business segments.

## 3. Use Cases for Contribution Margin:

- a. Pricing Decisions: Businesses can use contribution margin to determine appropriate pricing strategies. Products or services with higher contribution margins can support lower prices, while those with lower contribution margins may require higher prices to maintain profitability.
- b. Product Line Analysis: It helps businesses assess the profitability of different product lines or individual products. By comparing contribution margins, companies can identify which products contribute most to their overall profit.
- c. Cost Control: Understanding variable costs is essential for cost control efforts. Businesses can analyze and attempt to reduce variable costs to increase contribution margins.
- d. Break-Even Analysis: Contribution margin is a critical component in break-even analysis. It helps determine the sales volume needed to cover both variable and fixed costs, resulting in a break-even point.

## 4. Contribution Margin vs. Gross Margin:

- a. Gross Margin: Gross margin represents the difference between revenue and the cost of goods sold (COGS). It focuses solely on the direct costs of producing goods, while contribution margin considers variable costs beyond COGS, such as sales and marketing expenses.

## 5. Contribution Margin and Fixed Costs:

- a. After covering variable costs, the contribution margin is used to contribute to covering fixed costs (e.g., rent, salaries, utilities). Any remaining contribution margin contributes to net profit.

In summary, contribution margin is a valuable financial metric that helps businesses assess the profitability of products, services, or business segments. It provides insights into how much revenue is available to cover fixed costs and generate profit after accounting for variable costs. By understanding contribution margin, businesses can make informed pricing decisions, improve profitability, and allocate resources effectively.

## Profit & Loss Statement - XYZ Company

Sales	Year total	Percent of Sales
Products	\$19,000	
Services	\$6,000	
<b>Total Sales</b>	<b>\$25,000</b>	<b>100%</b>
<b>Cost of Goods Sold</b>	<b>\$3,600</b>	<b>14%</b>
<b>Gross Profit</b>	<b>\$21,400</b>	<b>86%</b>
<b>Expenses</b>		
Advertising		
Accounting		
Bad Debts		
Bank Charges		
Car Rental		
Phone	\$1,200	5%
Cleaning		
Commissions		
Consulting		
Contract Labor		
Credit Card Fees		
Donations		
Dues & Subscriptions		
Education		
Employee Benefits		
Freight		
Garbage	\$600	17%
Gas (Vehicle)		
Insurance		
Internet	\$600	2%
Inventory Purchases		
Loan Interest	\$7,182	29%
Office Supplies	\$240	7%
Outside Services		
Payroll Hourly	\$12,000	48%
Payroll Salary		
Payroll Taxes (12%)	\$1,440	6%

Sales	Year total	Percent of Sales
Parking		
Postage		
Printing		
Real Estate Taxes		
Refunds		
Rent/Lease	\$3,600	14%
Repairs/Maintenance		
Research & Development		
Security System		
Shop Supplies	\$300	1%
Snow Plowing		
Tools		
Travel		
Utilities	\$3,600	14%
Other		
<b>Total Expenses</b>	<b>\$31,362</b>	<b>125%</b>
<b>Net Profit</b>	<b>\$(9,962)</b>	<b>-40%</b>

If we take the Total Expenses number of \$31,362 and divide it by the Gross Profit Margin of 0.856

$\$31,362 / 0.856 = \$36,637$  is the Sales needed to Break Even.

### Proving it Works

$\$36,637 - \$25,000$  (current SALES) = \$11,637 INCREASE IN SALES to Break Even

$\$11,637 * 0.856 = \$9,962$  loss

If rent for XYZ Company goes up by \$2,000 per year, how much do Fixed Costs and Break Even Sales change?

Let's illustrate the concept of break-even with a simple example:

**Scenario:** Imagine you're starting a small business that manufactures and sells handcrafted wooden tables. You've estimated your initial costs and variable costs per table and set a selling price for your tables. Your goal is to determine at what level of sales you will break even, meaning your total revenue equals your total costs, resulting in zero profit or loss.

**Key Assumptions:**

- Fixed Costs (monthly): \$2,000 (rent, utilities, insurance, etc.)
- Variable Cost per Table: \$50 (includes materials and direct labor)
- Selling Price per Table: \$150

Calculating the Break-Even Point based on number of units:

$$\text{Fixed Cost} / (\text{Selling Price per Unit} - \text{Variable Cost per Unit}) = \text{Break-Even (in units)}$$

Substituting the values,  $\$2,000 / (\$150 - \$50) = 20$  units

**Interpretation:** Your break-even point is 20 units. This means you need to sell 20 tables to cover all your costs (fixed and variable) and reach a point where your total revenue equals your total costs. Below this level of sales, you would incur a loss; above it, you would generate a profit.

**Profitability Analysis:**

- If you sell fewer than 20 tables in a month, you would operate at a loss because your revenue would be less than your total costs.
- If you sell exactly 20 tables, your revenue would be \$3,000 (20 tables x \$150 each), and your costs would be \$2,000 in fixed costs and \$1,000 in variable costs (20 tables x \$50 each), resulting in zero profit or loss.
- If you sell more than 20 tables, your revenue would exceed your total costs, and you would start making a profit.

This break-even analysis provides you with a clear understanding of the level of sales you need to achieve to cover your costs and avoid losses in your table-making business. Beyond the break-even point, each table you sell contributes to your profit.