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# Cost-Volume-Profit (CVP) Analysis

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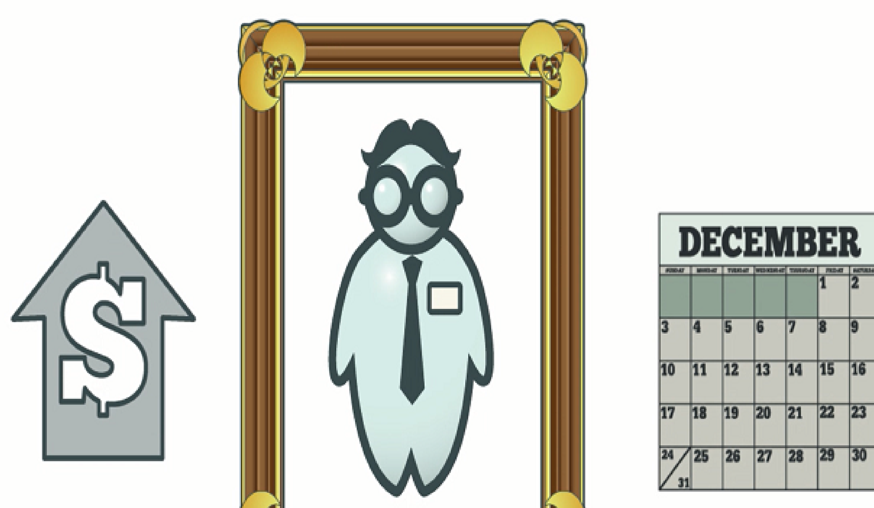
## What Is Cost-Volume-Profit (CVP) Analysis?

Cost-volume-profit (CVP) analysis is a method of cost accounting that looks at the impact that varying levels of costs and volume have on operating profit.

**KEY TAKEAWAYS**

- Cost-volume-profit (CVP) analysis is a way to find out how changes in variable and fixed costs affect a firm's profit.
- Companies can use CVP to see how many units they need to sell to break even (cover all costs) or reach a certain minimum profit margin.
- CVP analysis makes several assumptions, including that the sales price, fixed and variable cost per unit are constant.




Cost-Volume Profit Analysis

## Understanding Cost-Volume-Profit (CVP) Analysis

The cost-volume-profit analysis, also commonly known as breakeven analysis, looks to determine the breakeven point for different sales volumes and cost structures, which can be useful for managers making short-term business decisions. CVP analysis makes several assumptions, including that the sales price, fixed and variable cost per unit are constant. Running a CVP analysis involves using several equations for price, cost, and other variables, then plotting them out on an economic graph.

The CVP formula can be used to calculate the breakeven point. The breakeven point is the number of units that need to be sold, or the amount of sales revenue that has to be generated, in order to cover the costs required to make the product. The CVP breakeven sales volume formula is:

$$\text{Breakeven Sales Volume} = \frac{FC}{CM}$$

$$\textbf{where:}$$

$$FC = \text{Fixed costs}$$

$$CM = \text{Contribution margin} = \text{Sales} - \text{Variable Costs}$$

To use the above formula to find a company's target sales volume, simply add a target profit amount per unit to the fixed-cost component of the formula. This allows you to solve for the target volume based on the assumptions used in the model.

CVP analysis also manages product contribution margin. The contribution margin is the difference between total sales and total variable costs. For a business to be profitable, the contribution margin must exceed total fixed costs. The contribution margin may also be calculated per unit. The unit contribution margin is simply the remainder after the unit variable cost is subtracted from the unit sales price. The contribution margin ratio is determined by dividing the contribution margin by total sales.

The contribution margin is used in the determination of the breakeven point of sales. By dividing the total fixed costs by the contribution margin ratio, the break-even point of sales in terms of total dollars may be calculated. For example, a company with $100,000 of fixed costs and a contribution margin of 40% must earn revenue of $250,000 to break even.

Profit may be added to the fixed costs to perform CVP analysis on the desired outcome. For example, if the previous company desired a profit of $50,000, the necessary total sales revenue is found by dividing $150,000 (the sum of fixed costs and desired profit) by the contribution margin of 40%. This example yields a required sales revenue of $375,000.

## Special Considerations

CVP analysis is only reliable if costs are fixed within a specified production level. All units produced are assumed to be sold, and all fixed costs must be stable in a CVP analysis. Another assumption is all changes in expenses occur because of changes in activity level. Semi-variable expenses must be split between expense classifications using the high-low method, scatter plot, or statistical regression.

## How Is Cost-Volume-Profit (CVP) Analysis Used?

Cost-volume-profit analysis is used to determine whether there is an economic justification for a product to be manufactured. A target profit margin is added to the break-even sales volume, which is the number of units that need to be sold in order to cover the costs required to make the product, to arrive at the target sales volume needed to generate the desired profit. The decision-maker could then compare the product's sales projections to the target sales volume to see if it is worth manufacturing the product.

## What Assumptions Does Cost-Volume-Profit (CVP) Analysis Make?

The reliability of CVP lies in the assumptions it makes, including that the sales price and the fixed and variable cost per unit are constant. The costs are fixed within a specified production level. All units produced are assumed to be sold, and all fixed costs must be stable. Another assumption is all changes in expenses occur because of changes in activity level. Semi-variable expenses must be split between expense classifications using the high-low method, scatter plot, or statistical regression.

## What Is Contribution Margin?

The contribution margin can be stated on a gross or per-unit basis. It represents the incremental money generated for each product/unit sold after deducting the variable portion of the firm's costs. Basically, it shows the portion of sales that helps to cover the company's fixed costs. Any remaining revenue left after covering fixed costs is the profit generated. So, for a business to be profitable, the contribution margin must exceed total fixed costs.

*Selvaraju Santhalingam*

## Related Terms

### Breakeven Point (BEP)
In accounting and business, the breakeven point (BEP) is the production level at which total revenues equal total expenses. more

### What Is Operating Leverage?
Operating leverage is a cost-accounting formula that measures the degree to which a firm can increase operating income by increasing revenue. more

### What Is a Variable Cost?
A variable cost is an expense that changes in proportion to production or sales volume. more

### Break-Even Analysis
Break-even analysis calculates a margin of safety where an asset price, or a firm's revenues, can fall and still stay above the break-even point. more

### Full Costing Definition
Full costing is a managerial accounting method that describes when all fixed and variable costs are used to compute the total cost per unit. more

### Managerial Accounting Definition
Managerial accounting is the practice of analyzing and communicating financial data to managers, who use the information to make business decisions. more

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