



Brian Walters and Associates ***Management Consulting Services***

PURPOSE

The ability to calculate the break-even sales volume provides management of any small company with a financial tool that is useful in developing sales and pricing strategies and making decisions regarding capital purchases. The purpose of this article is to explain the break-even calculation and to describe some of its applications.

APPROACH

To assist with your understanding of the calculation and its uses, some key definitions will now be stated.

- Variable Expenses – also referred to as direct expenses, these are expenses that rise or fall proportionally with the rise or fall of sales. Direct labor and material purchases are the most obvious examples of variable expenses.
- Fixed Expenses – Also referred to as indirect expenses, these are expenses that will remain relatively constant regardless of the level of sales. Officer salaries and building rental expenses are examples of fixed expenses.
- Contribution Margin - Sales minus variable expenses. This is also referred to as gross margin or gross profit.
- Contribution Margin Percentage - Contribution margin divided by sales.
- Break-even Sales Volume - That level of sales which generates a contribution margin that is large enough to cover all of the fixed expenses.

CALCULATION

The break-even sales volume is determined by dividing the fixed expenses by the contribution margin percentage. Stated in formula format, the equation would read:

- A. Sales minus Variable Expenses = Contribution Margin
- B. Contribution Margin divided by Sales = Contribution Margin %
- C. Fixed Expenses divided by the Contribution Margin % = Break-even Sales

This calculation will clearly be different for each company, and for each period being assessed. For your own company's calculations, use the financial statements (Profit and Loss) from the most recent fiscal year as a basis.



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Sales	A
Variable Expenses	B
Contribution Margin	A - B
Contribution Margin %	$(A - B)/A$
Fixed Expenses	C
Break-even Sales	$C/(\text{Contribution Margin})$

NB- the calculation of the breakeven point is made infinitely easier by the use of an Excel spreadsheet. For assistance in creating such a spreadsheet, please contact the author of this document.

APPLICATIONS OF BREAKEVEN ANALYSIS

For these examples, we will assume the following for your company:

Annual revenues: \$2 Million	Indirect Expenses: \$700,000
Direct Expenses: \$1.2 Million	Net Profit: \$100,000
Contribution Margin: \$800,000 or 40%	Breakeven Sales: \$1.75 Million

Application A: Assume that your company needs to purchase a some new equipment, the total cost of which is \$50,000. How much additional sales would need to be generated to support such a purchase?

The temptation is strong to assume that \$50,000 in additional revenues would support a purchase of that dollar amount. However, recall that, from the discussion of the contribution margin $((\text{revenues} - \text{direct expenses})/\text{revenue})$, there are expenses that are incurred to produce \$50,000 in revenue. So a more accurate method of assessing this issue is by determining the amount of revenue that would be needed to produce \$50,000 worth of Net Profit.

This figure is determined by dividing the target additional profit by the contribution margin. So, for example, if your company's contribution margin is 40%, you would need to generate an additional \$125,000 in revenue to create an additional \$50,000 in profits, which can then be used to make capital purchases.



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Application B: How does a reduction in fixed expenses – rent, for example- impact the breakeven point? It is clear that a reduction in rent of \$10,000 would increase profitability by that exact amount, all other expenses and revenues being held constant, but what effect does it have on the break-even point?

A decrease in rent of \$10,000, would lower the breakeven point by an amount equal to the amount of the reduction divided by the contribution margin. To continue our example from above, if the company's contribution margin is 40%, the breakeven point would be lowered by \$25,000 ($\$10,000/.4$). This means that decreasing a fixed expense by \$10,000 decreases the amount of revenue that you need to break even by \$25,000.

Application C: What effect does a reduction in variable costs – getting a discount on materials purchases, for example- have on the breakeven point?

Assume a decrease in direct costs of \$200,000 to \$1 million. Also assume that all other revenues and expenses remain the same. The contribution margin and net profit will both increase by \$200,000, but how does the breakeven point change?

With the decrease in direct costs, the contribution margin is now \$1 million, and the contribution margin percent is 50%. With indirect costs of \$700,000, the new breakeven point is now \$1.4 million, a decrease of \$350,000 from the old breakeven point. This means that a decrease in direct expenses of \$200,000 decreases the revenue that you need to be able to break even by \$350,000.

SUMMARY

The break-even calculation can be used as a financial tool for making decisions on pricing, on purchasing capital equipment and on many other types of financial decisions. Since break even relates to revenue volume, a weekly or monthly break even point can be calculated to establish objectives for the company. The break even analysis should be performed at least on an annual basis to ensure continuing progress toward the financial goals of your company.