Break-Even Analysis

Break-even is one of the most commonly used methods for evaluating a new business enterprise or new product line or manufacturing facility. It's a tool for analyzing how sales revenue, profit and expenses vary with changes in one of the variables. The break-even point is an equalibrium where sales revenue is equal to costs. At the break-even point, no profits are earned and no losses are incurred. Break-even is a cash flow tool (so we will not consider non-cash expenses in the calculation) that is easy to calculate. It is widely used in production management and by cost and management accountants and can prove useful in determining whether to make an investment in a new plant, a specific piece of equipment or a whole business entity.

One of the drawbacks of the break-even analysis is the assumption that nothing changes. That is, the model assumes that the conditions that were present during the calculation do not change. Of course, everything changes constantly. Sales prices are affected by overall sale volumes and costs of raw materials, labor and transportation costs. The relationship between Therefore, the break-even must be recalculated on a regular basis in order to keep the information relevant and useful.

In order to compute the break-even point, we need to know the following variables:

- Annual Sales Revenue
- Gross Profit Margin
- Operating Expenses (less depreciation)
- Annual Debt Service

With these figures in hand, we can caluate the various components of break-even.

Break-Even Sales: $\frac{\text{(Operating Expenses + Annual Debt Service)}}{\text{Gross Pofit Margin \%}}$

Break-Even Gross Margin: $\frac{\text{(Operating Expenses + Annual Debt Service)}}{\text{Sales}}$

Break-Even Operating Exp.: Sales × Gross Pofit Margin %

Break-Even Worksheet

Using the following data for a ficticious company, calculate the break-even components.

Sales:	$1,000,000
Gross Profit:	250,000
Operating Expenses:	170,000
Debt Payment:	2,500

Break-Even Sales: (Fixed Costs + Annual Debt Service) ÷ Gross Margin %

Fixed Costs = $170,000
Annual Debt Service = $2,500 × 12 = $30,000
Gross Margin % = $250,000 ÷ $1,000,000 = .25 × 100 = 25%

($170,000 + $30,000) ÷ 25% = $200,000 ÷ .25 = **$800,000**

Break-Even Margin: (Fixed Costs + ADS) ÷ Sales

Fixed Costs = $170,000
Annual Debt Service = $2,500 × 12 = $30,000

($170,000 + $30,000) ÷ $1,000,000 = $200,000 ÷ $1,000,000 = 0.20 = **20.0%**

Break-Even Operating Expenses: Sales × Gross Margin %

Gross Margin % = $250,000 ÷ $1,000,000 = .25 × 100 = 25%

$1,000,000 × 25% = $1,000,000 × .25 = **$250,000**