Break-Even Point and Margin of Safety

Break-even volume and revenue from fixed costs, selling price and variable cost per unit, with contribution margin, profit at a planned volume and margin of safety.

Method: Cost–volume–profit analysis (management accounting)

Input parameters

Unit system: SI

Parameter	Value	Unit
Fixed costs per period	2,000,000	
Selling price per unit	500.00	
Variable cost per unit	300.00	
Planned volume (units per period)	15,000	

Calculated results

Parameter	Value	Unit
Break-even volume (units)	10,000	
Break-even revenue	5,000,000	
Contribution margin ratio (p − v)/p	40.000	%
Profit at the planned volume	1,000,000	
Margin of safety (share of planned volume above break-even)	33.333	%

Formula and method

$$Q_{BE} = \frac{F}{p - v}, \quad R_{BE} = p\,Q_{BE}, \quad CM = \frac{p - v}{p}$$

$$\Pi = Q(p - v) - F, \quad MOS = \frac{Q - Q_{BE}}{Q}$$

Variables

F	Fixed costs per period	-
p	Selling price per unit	-
v	Variable cost per unit	-
Q	Planned volume (units per period)	-
Q_{BE}	Break-even volume (units)	-
R_{BE}	Break-even revenue	-
CM	Contribution margin ratio (p − v)/p	-
Π	Profit at the planned volume	-
MOS	Margin of safety (share of planned volume above break-even)	-

Method and standards

Cost–volume–profit analysis with linear costs: each unit sold contributes price less variable cost towards the fixed costs.

Assumptions and limits

- Linear costs and prices over the range.
- The margin of safety is not shown when the planned volume is zero.

References

• Cost–volume–profit analysis (management accounting)

Report details

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Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

This calculator online

https://calc.firecad.com/general/economics/break-even-point

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Reopens the calculator with the inputs of this report.