BEP, PV, NPV

Examples

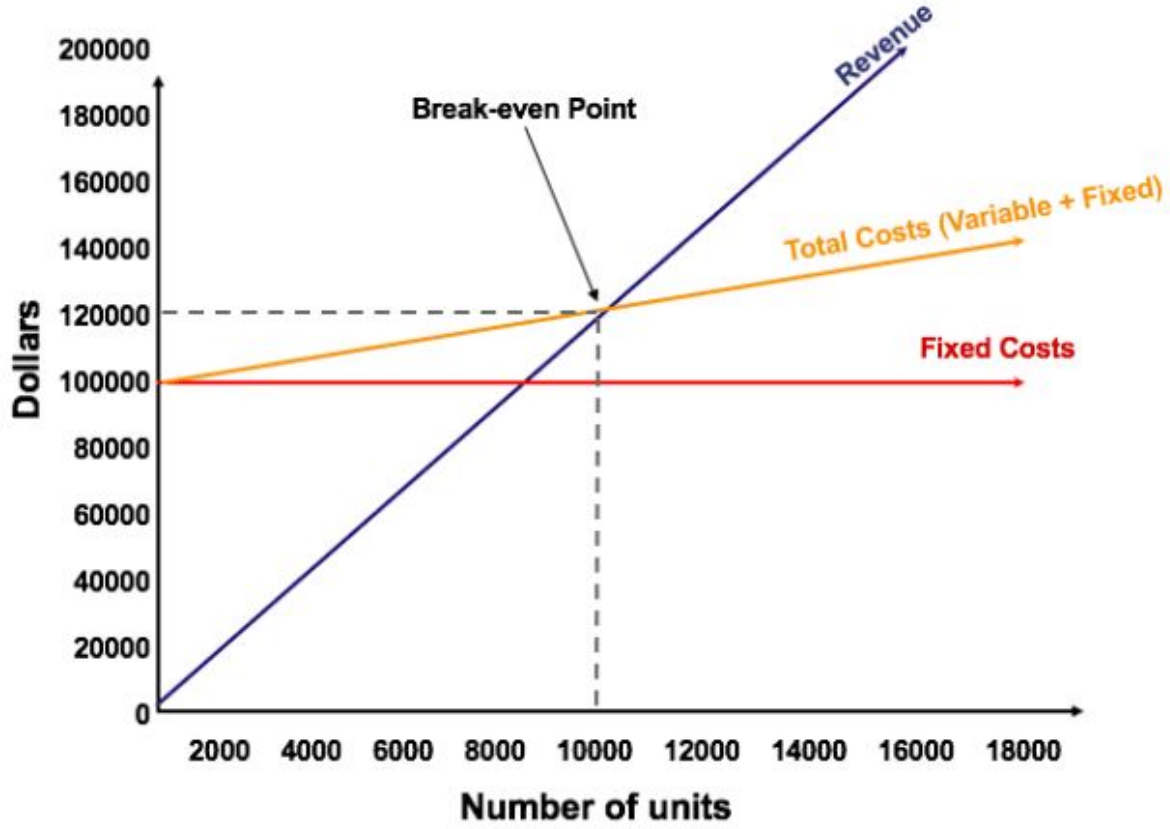
Break Even Point

Profit when **Revenue > Total Variable Cost + Total Fixed Cost**

Break-even point when **Revenue = Total Variable Cost + Total Fixed Cost**

Loss when **Revenue < Total Variable Cost + Total Fixed Cost**

Break Even Point



Break Even Point

Contribution Margin is the difference between the price of a product and what it costs to make that product.

$$\text{Contribution Margin} = \text{Price Per Unit} - \text{Variable Cost Per Unit}$$

$$\text{Gross Profit Margin} = \frac{\text{Revenue - Cost of Goods Sold}}{\text{Revenue}} \times 100$$

Break Even Point

$$\text{Break-Even Point (BEP)} = \frac{\text{Fixed Costs}}{\text{Contribution Margin}}$$

Break Even Point (Example - 1)

Sam's Sodas is a soft drink manufacturer in the Seattle area. He is considering introducing a new soft drink, called Sam's Silly Soda. He wants to know what kind of impact this new drink will have on the company's finances. So, he decides to calculate the break-even point, so that he and his management team can determine whether this new product will be worth the investment.

Fixed Costs = $2,000 (total, for the month)

Variable Costs = .40 (per can produced)

Sales Price = $1.50 (a can)

Break Even Point (Example - 1)

Calculating the Break-Even Point in Units

BEP = Fixed Costs ÷ (Sales price per unit – Variable costs per unit)

= $2000/($1.50 – $.40)

= $2000/1.10

= 1818 units

This means Sam needs to sell just over 1800 cans of the new soda in a month, to reach the break-even point.

Break Even Point (Example - 1)

Calculating The Break-Even Point in Sales Dollars

Profit Margin = ($1.50 – $0.40) / $1.50 * 100%

= 73.33%

BEP = Fixed Costs / Profit Margin

= $2000/.7333

= $2727

This means Sam's team needs to sell $2727 worth of Sam's Silly Soda in that month, to break even. Anything after that amount, will be profit for the company.

To confirm this figure: you can take the 1818 units from the first calculation, and multiply that by the $1.50 sales price, to get the $2727 amount.

Break Even Point (Example - 2)

A company has $10,000 in fixed costs per month, and their product has an average selling price (ASP) of $100, and the variable cost is $20 for each product

Fixed Costs per Month = $10,000

Average Selling Price (ASP) = $100.00

Variable Cost per Unit = $20.00

Contribution Margin = $100.00 - $20.00 = $80.00

Break-Even Point (BEP) = $10,000 / $ 80 = 125 Units

Future Value (Example - 3)

Suppose you deposit 1,000 taka today in a bank which pays 10 percent interest compounded annually, how much will the deposit grow to after 8 years and 12 years?

Future Value (Example - 3)

Suppose you deposit 1,000 taka today in a bank which pays 10 percent interest compounded annually, how much will the deposit grow to after 8 years and 12 years?

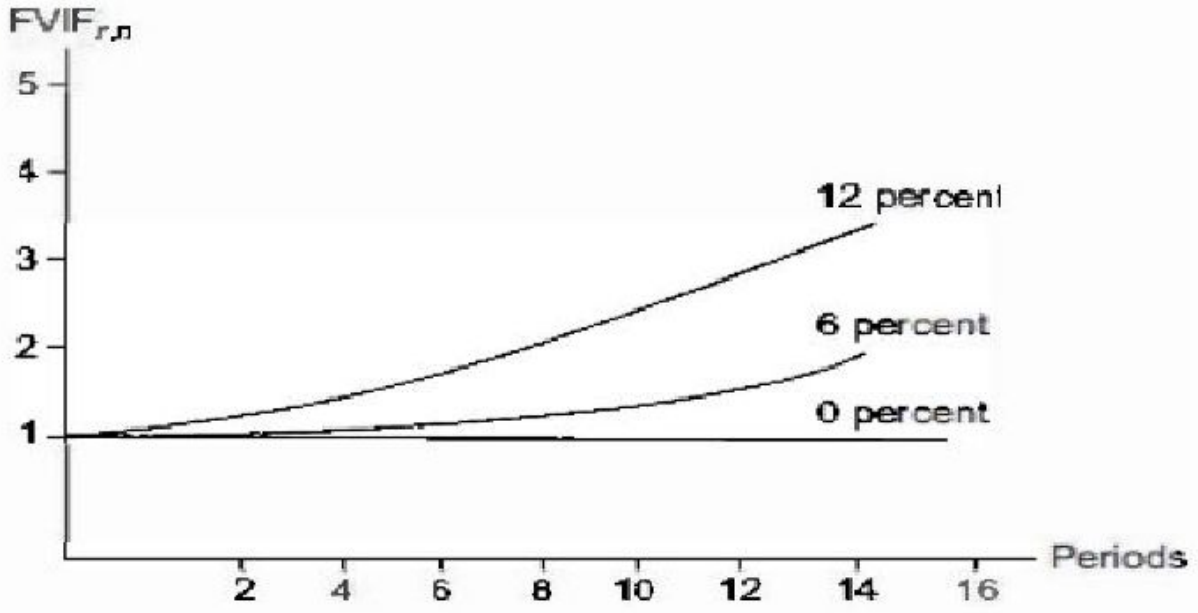
$$₹1{,}000\ (1.10)^8 = ₹1{,}000\ (2.144)$$
$$= ₹2{,}144$$

The future value, 12 years hence, will be:

$$₹1{,}000\ (1.10)^{12} = ₹1{,}000\ (3.138)$$
$$= ₹3{,}138$$

Future Value

Exhibit 7.3 *Graphic View of Compounding*



Present Value (Example - 4)

What is the present value of $1,000 receivable 20 years hence if the discount rate is 8%?

$$₹1{,}000\left(\frac{1}{1.08}\right)^{20} = ₹1{,}000\left(\frac{1}{1.08}\right)^{10}\left(\frac{1}{1.08}\right)^{10}$$

$$= ₹1{,}000\,(PVIF_{8\%,10})(PVIF_{8\%,10})$$

$$= ₹1{,}000\,(0.463)(0.463) = ₹214$$

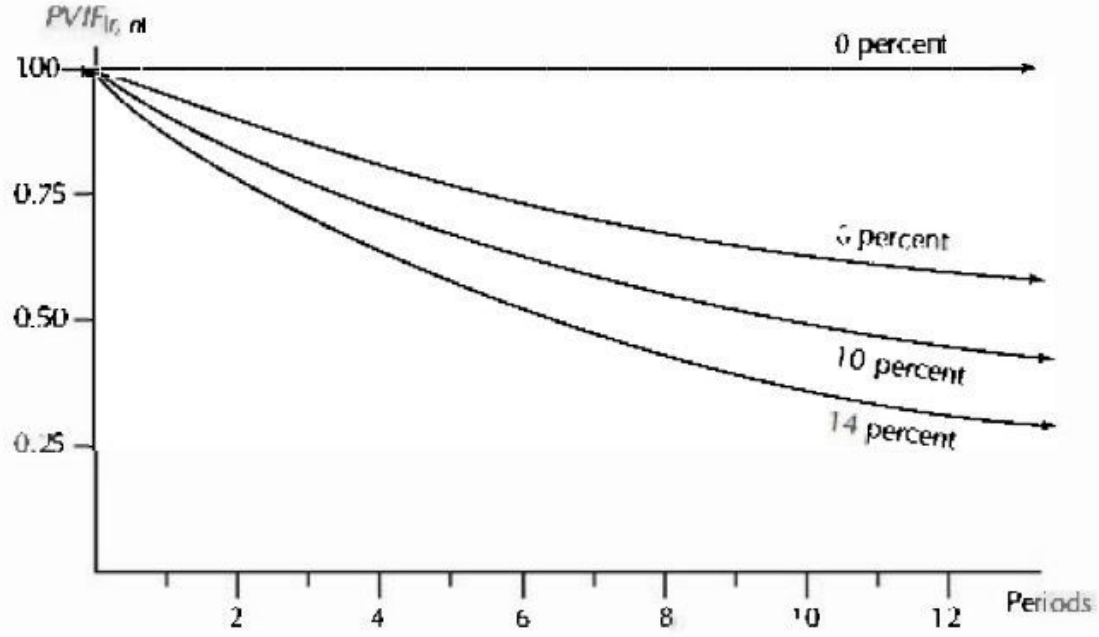
Present Value (Do Yourself)

- Suppose someone promises to give you 1,000 taka three years hence. What is the present value of this amount if the interest rate is 10 percent?

- What is the present value of 1,000 receivable 6 years hence if the rate of discount is 10 percent?

Present Value

Exhibit 7.6 *Graphic View of Discounting*



Net Present Value (Example - 5)

Year	Cash Flow
0	(10,00,000)
1	2,00,000
2	2,00,000
3	3,00,000
4	3,00,000
5	3,50,000

The cost of capital, r, for the firm is 10 percent. Find the net present value of the project.

Net Present Value (Example - 5)

$$NPV = -\frac{1,000,000}{(1.10)^0} + \frac{200,000}{(1.10)^1} + \frac{200,000}{(1.10)^2} + \frac{300,000}{(1.10)^3} + \frac{300,000}{(1.10)^4} + \frac{350,000}{(1.10)^5} = ₹5,27$$

Net Present Value (Do Yourself)

Suppose, you invested $10,000 in a business. It gives you the following cash flows in successive years. Find the Net Present Value.

Year	Cash Flow (₹)
1	1,000
2	2,000
3	2,000
4	3,000
5	3,000
6	4,000
7	4,000
8	5000

Ans. $3,376