

3. Sensitivity in Sales Volume

1st Approach (10%↓)

Units 1st YEAR = 18000, 2 YEAR = 27000, 3 YEAR = 27000

$$NPV = 179264$$

$$\text{Sensitivity} = \frac{310293 - 179264}{310293} \times 100 = 42.22\%$$

2nd Approach

$$20 \times x - 1000000 = 0$$

$$x = \frac{1000000}{20} = 50000 \text{ units}$$

$$\text{Sensitivity} = \frac{65514.651 - 50000}{65514.651} \times 100 = 23.68\%$$

(ii) Sensitivity in unit cost

1st Approach

$$\text{Unit cost} = ₹ 40 (10\% \uparrow) = ₹ 44$$

$$\text{NPV} = ₹ 48234$$

$$\text{Sensitivity}_Q = \frac{310293 - 48234}{310293} \times 100 = 84.46\%$$

2nd Approach

$$\text{Sensitivity in unit cost} = \frac{4.74}{40} \times 100 = 11.85\%$$

Alternative

$$20 \times \left[\frac{2x}{(1.10)^1} + \frac{3x}{(1.10)^2} + \frac{3x}{(1.10)^3} \right] - 1000000 = 0$$

$$20 \times 6.5515x = 1000000$$

$$x = \frac{1000000}{20 \times 6.5515} = \boxed{7631.84}$$

YEAR	Units	
1	(2×7631.84)	$= 15263.68$
2	(3×7631.84)	$= 22895.52$
3	(3×7631.84)	$= 22895.52$
		<u>61054.72</u>

$$\text{Sensitivity}_Q = \frac{80000 - 61054.72}{80000} \times 100 = 23.68\%$$

20000 30000 30000

(d) Sensitivity in Initial Outlays

Approach 1

$$\text{Initial Outlays} = 1000000 (10\% \uparrow) = ₹ 1100000$$

$$\text{NPV} = 210293$$

$$\text{Sensitivity} = \frac{310293 - 210293}{210293} \times 100 = 32.23\%$$

Approach 2

$$\text{Sensitivity} = \frac{310293}{1000000} \times 100 = 31.03\%$$

(e) project life

2nd Approach

Calculate Discounting PBP (1000000)

<u>YEAR</u>	<u>PV of CF</u>	<u>Cum PV of</u>
1	363636	363636
2	495868	859504
3	450789	1310293

$$\text{Disc. PBP} = 2 \text{ YEARS} + \left(\frac{1 \text{ YEAR}}{450789} \times 140496 \right)$$
$$= 2.312 \text{ YEARS.}$$

$$\text{Sensitivity} = \frac{3 - 2.312}{3} \times 100 = 22.93\%$$

1st Approach (अगर life देरवा नहीं और last में जाकर फंस गए)

project life (33.33% ↓)

$$3 \text{ YEARS} - 33.33\% = 2 \text{ YEARS}$$

$$\text{NPV} = 363636 + 495868 - 1000000 = -140496$$

$$\Delta \text{ in NPV} = \frac{310293 - (-140496)}{310293} \times 100$$

$$= 145.28\%$$
$$\text{Sensitivity} = \frac{145.28}{33.33\%} \times 100 = 43.59\%$$

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Question: 33

TYK 11

Red Ltd. is considering a project with the following Cash flows:

Years	Cost of Plant	Recurring Cost	Savings
0	10,000		
1		4,000	12,000
2		5,000	14,000

The cost of capital is 9%. Measure the sensitivity of the project to changes in the levels of plant value, running cost and savings (considering each factor at a time) such that the NPV becomes zero. The P.V. factor at 9% are as under:

Year	Factor
0	1
1	0.917
2	0.842

Which factor is the most sensitive to affect the acceptability of the project?

H.W

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Question – 33

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Which factor is the most sensitive to affect the acceptability of the project?

$$\text{P.V. of Savings} = 22792$$
$$(12000 \times 0.917) + (14000 \times 0.842)$$

$$\text{P.V. of Recurring cost}$$
$$(4000 \times 0.917) + (5000 \times 0.842)$$

$$\text{NPV} = 22792 - 7878 - 10000 = 4914$$
$$\frac{4914}{22792} \times 100 = 21.56\%$$
$$\frac{4914}{7878} \times 100 = 62.38\%$$
$$\frac{4914}{10000} \times 100 = 49.14\%$$