

Question: 25

If Investment proposal costs ₹ 45,00,000 and risk free rate is 5%, calculate net present value under certainty equivalent technique.

Year	Expected cash flow (₹)	Certainty Equivalent coefficient
1	10,00,000	0.90
2	15,00,000	0.85
3	20,00,000	0.82
4	25,00,000	0.78

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3. Other Techniques

- ① Sensitivity Analysis
 - ② Scenario Analysis
 - ③ Simulation
 - ④ Decision Tree
- 

Sensitivity Analysis

Eg Cost of project = 120000
CFAT = 45000
life = 5
COC = 10% p.a.

Calculate NPV

Calculate Sensitivity

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COP = 42.16%

CFAT = 29.66%

life = 34.80%

COC = 154.30%

Sensitivity

① Cost of project

Let assume Cost of project be x
at which NPV should be "0"

$$(45000 \times 3.791) - x = 0$$

$$x = 170595$$

$$\text{Sensitivity in COP} = \frac{170595 - 120000}{120000} \times 100$$
$$= 42.16\%$$

FORMULA

$$\text{Sensitivity in COP} = \frac{\text{NPV}}{\text{COP}} \times 100$$

② Annual CFAT

Let assume Annual CFAT be x at which NPV should be "0"

$$(x \times 3.791) - 120000 = 0$$

$$x = \frac{120000}{3.791} = ₹ 31654$$

$$\text{Sensitivity in CFAT} = \frac{45000 - 31654}{45000} \times 100 = 29.66\%$$

FORMULA

$$\text{Sensitivity in CFAT} = \frac{NPV}{PVCAT}$$

$$= \frac{50595}{45000 \times 3.791} = 29.66\%$$

3. Life of project

Assume life of project be 4 YEARS

$$NPV = (45000 \times 3.170) - 120000 = 22650$$

(PVAF, 10%, 4)

Life 3 YEAR

$$NPV (45000 \times 2.487) - 120000 = (8085)$$

(PVAF, 10%, 3)

Interpolation

4 YEARS

3 YEARS

1 YEAR

$$\begin{array}{r} 22650 \checkmark \\ (8085) \end{array} \rightarrow \begin{array}{l} 22650 \\ 0 \text{ NPV} \end{array}$$

$$\underline{30735}$$

$$\text{Life} = 4 \text{ YEARS} - \left(\frac{1}{30735} \times 22650 \right)$$
$$= 3.26 \text{ YEARS}$$

Sensitivity in life

Discounting PBP (120000)

YEAR	PVCFAT (10%)	CumCFAT
1	40909	40909
2	37190	78099
3	33809	111908
4	30736	
5	27941	

$$3 \text{ YEARS} + \left(\frac{1}{30736} \times 8092 \right)$$
$$= 3.26 \text{ YEARS}$$

$$\text{Sensitivity in life} = \frac{5 \text{ YEARS} - 3.26 \text{ YEARS}}{5 \text{ YEARS}} \times 100 = 34.8\%$$

④ Sensitivity in CoC

Discounting Rate at which NPV = 0

10% = 50595

20% = 14577

25% = 1018

28% = (6060)

25%

28%

3%

1018 + 1018

(6060)

7078

$$IRR = 25 + \left(\frac{3}{7078} \times 1018 \right)$$

$$= 25.43\%$$

25.66%

25.33% - 25.85%

$$\text{Sensitivity in CoC} = \frac{25.43 - 10}{10} \times 100$$

$$= 154.30\%$$