

How to Calculate NPV

- Real Cash flows should be discounted with Real discounting Rate.
- Nominal Cash flows should be discounted with Nominal discounting Rate.

Eg

Cost of project = ₹ 100000

Cash flows

1	70000
2	50000
3	40000

Discounting Rate = 10% p.a.

① Calculate NPV assuming
No Inflation.

RCF & RDR

$$\begin{aligned} \text{NPV} &= \frac{70000}{(1.10)^1} + \frac{50000}{(1.10)^2} \\ &+ \frac{40000}{(1.10)^3} - 100000 \\ &= \boxed{35011} \end{aligned}$$

$$\begin{aligned} \text{NPV} &= (70000 \times 0.909) + (50000 \times 0.826) \\ &+ (40000 \times 0.751) - 100000 \\ &= 34970 \end{aligned}$$

② Suppose Inflation Rate 5% p.a.
Calculate NPV using NCF & NDR

1 Nominal Cash flows

<u>YEAR</u>	<u>NCF</u>
1	73500
2	55125
3	46305

② NDR

$$\text{NDR} = (1.10 \times 1.05) - 1 \\ = 15.5\% \text{ p.a.}$$

$$\text{NPV} = \frac{73500}{(1.155)^1} + \frac{55125}{(1.155)^2} + \frac{46305}{(1.155)^3} - 100000 = \boxed{35044}$$

$$\text{NPV} = (73500 \times \underline{0.866}) + (55125 \times \underline{0.750}) \\ + (46305 \times \underline{0.649}) - 100000 = 35047$$

$$10\% \text{ RDR} \quad \frac{0.909}{(1.05)} \quad \frac{0.826}{(1.05)^2} \quad 0.757$$

Eg

<u>YEAR</u>	<u>NCF</u>
1	40000
2	30000
3	25000

Cost of project = ₹ 50,000

Inflation Rate = 5% p.a.

PVF (RDR) =

1	0.890
2	0.792
3	0.704

Calculate NPV
using NCF & RDR

YEAR Factor (RDR)

1 $0.890 / 1.05 = 0.848$

2 $0.792 / (1.05)^2 = 0.718$

3 $0.704 / (1.05)^3 = 0.608$

$$\begin{aligned} \text{NPV} &= (40000 \times 0.848) + (30000 \times 0.718) \\ &\quad + (25000 \times 0.608) - 50000 \\ &= 20660 \end{aligned}$$

Question: 44

(TYK 17)

A firm has projected the following cash flows from a project under evaluation:

Year	₹ lakhs
0	(70)
1	30
2	40
3	30

NCF

The above cash flows have been made at expected prices after recognizing inflation. The firm's cost of capital is 10%. The expected annual rate of inflation is 5%.

Show how the viability of the project is to be evaluated.

IN·N·I Calculation
of NDR

$$\text{NDR} = \left[(1.10)(1.05) \right] - 1$$
$$= 15.5\%$$

Calculation of NPV (NCF & NDR) (Lakhs)

	YEAR	PVF (15.5%)	Amt	P.V.
Cash outflows Cost of project	0	1.000	70	70
				<u>70</u>
Cash Inflows NCF	1	0.866	30	25.98
	2	0.750	40	30.00
	3	0.649	30	19.47
				<u>75.45</u>
NPV				<u>5.45</u>

project is
Viable due
to positive
NPV