Issues

Capital Budgeting

Q. A project costs Rs. 25000 and is expected to generate the following cash inflows:

Year	Cash inflows
1	10,000
2	8,000
3	9,000
4	6,000
5	7,000

The cost of capital is 12%. Should the project be accepted on the basis of NPV criterion?

Solution:

Year (t)	Cash Flows (C_t)	$\frac{1}{(1+r)^t}$	$\frac{C_t}{(1+r)^t}$
1	10,000	0.893	8,930
2	8,000	0.797	6,376
3	9,000	0.712	6,408
4	6,000	0.636	3,816
5	7,000	0.567	3,969
			29,499

$$NPV = \sum_{t=1}^{n} \frac{C_t}{(1+r)^t} - \text{Initial Investment}$$

$$= 29,499 - 25,000$$

$$= 4,499$$

The project generates a positive NPV of Rs.4499. Therefore project should be accepted.

Q. A firm is considering an investment proposal which requires an initial cash outlay of Rs. 8 lakh now and Rs. 2 lakh at the end of third year. It is expected to generate cash-flows as under:

Year	Cash inflows
1	3,50,000
2	8,00,000
3	2,50,000

Apply the discount rate of 12% and calculate profitability index. Should the firm accept the project according to this criteria.

Solution:

Present Value of Cash out flows.

Year (t)	Cash-flow (C_t)	$\frac{1}{(1+r)^t}$	$\frac{C_t}{(1+r)^t}$
0	8 lakhs	1	8 lakhs.
1	0	—	—
2	0	—	—
3	2 lakhs	0.712	1.424 lakhs.
			9.424 lakhs.

Present value of Cash inflows

Year (t)	Cash-flow (C_t)	$\frac{1}{(1+r)^t}$	$C_t \times \frac{1}{(1+r)^t}$
1	3,50,000	0.893	3.1255 lakhs
2	8,00,000	0.797	6.376 lakhs
3	2,50,000	~~0.656~~ 0.712	1.78 lakhs
			11.2815 lakhs.

$$P.I = \frac{\text{Total of present value of cash inflows}}{\text{Total of present value of cash outflows}}$$

$$= \frac{11.2815}{9.424}$$

$$= 1.197$$

Since, the profitability index of the project is greater than 1, it should be accepted.

Q. A project requires an initial outlay of Rs. 1,00,000. It is expected to generate the following cash inflows:

Year	Cash inflows
1	50,000
2	50,000
3	30,000
4	40,000

Calculate ~~the~~ IRR of the project?

Solution:

Assume the discount rate to be 20% and calculate the present value of cashflows

$$PV \text{ of cashflows} = \frac{50,000}{(1+\cdot 2)} + \frac{50000}{(1+\cdot 2)^2} + \frac{30,000}{(1+\cdot 2)^3} + \frac{40,000}{(1+\cdot 2)^4}$$

$$= 41,666\cdot 67 + 34,722\cdot 22 + 17,361\cdot 11 + 19,290\cdot 12$$

$$= 113,040\cdot 12$$

Assume the discount rate to be 30%. and calculate the present value of cash flows,

Present value of cash-flows.

$$= \frac{50,000}{(1+.3)} + \frac{50,000}{(1+.3)^2} + \frac{30,000}{(1+3)^3} + \frac{40,000}{(1+.3)^4}$$

$$= 38,461.54 + 29,585.8 + 13,654.98 + 14,005.12$$

$$= 95,707.44$$

Since the initial investment of Rs 1,00,000 lies between 95,707.44 (30%) and 1,13,040.12 (20%) the IRR by interpolation

Since the ~~internal investment~~

$$IRR = 20 + \left(\frac{1,13,040.12 - 1,00,000}{1,13,040.12 - 95,707.44} \right) \times 10$$

$$= 20 + \left(\frac{13,040.12}{17,332.68} \times 10 \right)$$

$$= 20 + (0.7524 \times 10)$$

$$= 27.52\%$$