CSS - 2024 . | Business Administration | IRR Assignment

CSS - 2005

Q. Star corporation is considering a project with a cost of Rs. 40,000/= net investment and net operating cash inflows of Rs. 11,652/= each year for the next five years. The firm uses 10% discount rate for projects with similar risks.

(a) What is projects net present value? (7)

(b) What is its initial rate of return? (7)

CSS – 2013

Q.9. Sapphire Corporation is considering cash outlay of $800,000 for acquisition of new equipment. The useful life is four years and the firm assesses zero residual value at the end of four years. After-tax cash inflow of $200,000 is expected in year 1, $250,000 in year 2, $300,000 in year 3, $400,000 in year 4. The company falls in the tax bracket of 50%.

(i) If the required rate of return is 15 percent, what is the net present value of the project? Is the project acceptable?

(ii) What is the internal rate of return?

CSS – 2018 (A & A)

ABC Company is considering a new product line to supplement its range line. It is anticipated that the new product line will involve cash investment of Rs. 700,000 at Time 0 and Rs. 1.0 million in year 1. After tax cash inflows of Rs. 250,000 are expected in year 2, Rs 300,000 in year 3, Rs. 350,000 in year 4, and Rs. 400,000 each Year thereafter through year 10. Through the product line might be viable after Year 10, Company prefers to be conservative and end all calculations at that time.

Required:

(a) if the required rate of return is 15% what is the net present value of the Project. Is it acceptable?

(b) What is its internal rate of return?

Example # 1

Find the IRR of an investment having initial cash outflows of Rs.213000, The cash inflow during the first , second , third and fourth years are expected to be Rs. 65,200 , Rs.96,000 , Rs.73,100 and Rs.55,400 respectively

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Example # 2

A company is deciding whether to purchase new equipment that costs Rs.500,000. Management estimates the life of the new asset to be four years and expects it to generate an additional profit of Rs.160,000 each year. In the fifth year, the company plans to sell the equipment for its salvage value of Rs.50,000. Meanwhile, investment can generate 10% return. Calculate IRR.

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Business Administration

IRR Assignment

CSS-2005

NPV = PV of inflows - PV of outflows

* Formula for Present Value = $\frac{\text{Future Value}}{(1+r)^n}$

n	Outflow	r_a	Inflows	PV_a	r_b	PV_b
0	(40,000)					
1		10%	11652	10592.7	20%	9710
2		10%	11652	9629.7	20%	8091.66
3		10%	11652	8754.32	20%	6743
4		10%	11652	7958.47	20%	5619
5		10%	11652	7234.97	20%	4682.7
	PV of inflows	=		44170.16		34846.5

NPV_a = 44170.6 - 40,000
= 4170

NPV_b = 34846.53 - 40,000
= -5153.46

The Net Present Value of the project is 4170 @ 10% rate of return.

b- $IRR = r_a + \frac{NPV_a}{NPV_a - NPV_b}(r_a - r_b)$

$= 10\% + \frac{4170}{(4170) + (-5153.46)}(10\%$

IRR = 14.47%

CSS- 2013

n	Outflow	Inflow	r_b	PV	r	PV
0	(800,000)					
1		200,000	15%	173913	5%	190476
2		250,000	15%	189036	5%	226757
3		300,000	15%	197255	5%	259151
4		400,000	15%	228701	5%	329081
PV of inflows. =				788905		1005465

Formula used for calculation of Present Value:

$$= \frac{\text{Future Value}}{(1+r)^n}$$

NPV_b = PV of cash inflows − PV of cash outflows

$= 788905 - 800{,}000$

$\boxed{NPV_b = -11095}$ @ $\boxed{r_b = 15\%}$

$NPVa = 1005465 - 800{,}000$

$\boxed{NPV_a = 205465}$ @ $\boxed{r_a = 5\%}$

$$IRR = r_a + \frac{NPV_a}{NPV_a - NPV_b}(r_b - r_a)$$

$$= 5\% + \frac{205465}{205465 + 11095}(10\%)$$

$$\boxed{IRR = 14.48\%}$$

The project is not acceptable at 15% rate of return as it is expected to result in loss considering the time value of money.

CSS-2018 (A&A)

n	Outflows	Inflows	r_b	PV_b	r_a	PV_a
0	(700,000)		15%		5%	
1	(1000,000)		15%	(869565)	5%	(1952381)
2		250,000	15%	189036	5%	226757
3		300,000	15%	197255	5%	259151
4		350,000	15%	200114	5%	287946
5		400,000	15%	198871	5%	313411
6		400,000	15%	172931	5%	298486
7		400,000	15%	150375	5%	284273
8		400,000	15%	130761	5%	270736
9		400,000	15%	113705	5%	257844
10		400,000	15%	98874	5%	245565
PV of inflows				1451922		2444169

NPV_b = PV of inflows − PV of outflows

= 1451922 − (700,000 + 869565)

NPV_b = −117643

NPV_a = 2444169 − (1652381)

NPV_a = 791788

$$IRR = r_a + \frac{NPV_a}{NPV_a \mp NPV_b}(r_b - r_a)$$

$$IRR = 5\% + \frac{791788}{(791788 + 117643)}(10\%)$$

IRR = 13.706%

- The project is not acceptable at 15% required rate of return because the amount recovered is less than the amount invested according to time value of money.

Example #01

* Assuming initial rate of return @ 10%

n	Outflow	Inflow	r	PV	r	PV
0	(213000)					
1		65200	10%	59272	20%	54333
2		96000	10%	79338	20%	66667
3		73100	10%	54921	20%	42303
4		55400	10%	37839	20%	26717
PV of inflows				231370		190020

$NPV_a = 231370 - 213000$

$\boxed{NPV_a = 210{,}000}$ @ $r_a = 10\%$

$NPV_b = 190020 - 21300$

$\boxed{NPV_b = -22980}$ @ $r_b = 20\%$

$$IRR = r_a + \frac{NPV_a}{NPV_a - NPV_b}(r_b - r_a)$$

$$IRR = 10\% + \frac{210{,}000}{210{,}000 + 22980}(10\%)$$

$$\boxed{IRR = 19.01\%}$$

Example # 02

n	Outflow	Inflow	r_a	PV_a	r_b	PV_b
0	(500,000)					
1		160,000	10%	145455	20%	133,333
2		160,000	10%	132231	20%	111,111
3		160,000	10%	120210	20%	92593
4		160,000	10%	109282	20%	77161
5		50,000	10%	31046	20%	20094
PV of inflows				538224		434292

NPV_a = PV of inflows − PV of outflows

= 538224 − 500,000

$\boxed{NPV_a = 38224}$ @ $\boxed{r_a = 10\%}$

NPV_b = PV of inflows − PV of outflows

= 434292 − 500,000

$\boxed{NPV_b = -65708}$ @ $\boxed{r_b = 20\%}$

$$IRR = r_a + \frac{NPV_a}{NPV_a - NPV_b}(r_b - r_a)$$

$$= 10\% + \frac{38224}{38224 + 65708}(10\%)$$

$\boxed{IRR = 13.67\%}$