Internal Rate of Return – Shortcut

IRR calculation is always a little bit uncomfortable to students as it involves lengthy calculations. The below referred six steps may help you to arrive at the IRR in a shortest way.

We have worked out a sample problem to understand how to use these steps. The problem has been framed /written by me on my own and all the explanations are my views only please use them only for studying purpose . Please do not commercialize.

You may refer the below you tube lectures for more clarity

http://www.youtube.com/watch?v=mc7qcLqzh8M

http://www.youtube.com/watch?v=Sgw2vqxW6Sw

Question :

The Managing Director of Smart Xerox & Scan Company is thinking of two **mutually exclusive projects** for his company .

Project 1:

Designing of a Machine with printing & Faxing option.

Project 2:

Designing of a Machine with the options of Printing, Scanning, Faxing & Xerox

After the designing the company is planning to manufacture 50 machines of any one of them and provide the same on rental basis
to various users. The rent will be decided based on the usage of the machines at the clients place. All machines in a particular
user's place will be linked with a server which will be accouting the usage details of the machines. To facilitate this accounting of
usage the Smart Xerox & Scan company has to install a computer device which will be recording the details . The cost of each
such device is Rs. 25000/- There will be a need of 10 such devices for both the projects. As per the

Income tax provisions

the computer device is fully depreciable in the year in which it is put to use.
All these devices are installed at the year 0. Taxation 33% . Comment which project should be selected and why.

The rate of capitalization of the company is 16%

There is no solvage value for the computer device at the end of the project

The additional cash flows of both the projects are as below

Year	Description	Project 1	Project 2
0	Exclusive development Expenses	100000	165000
1	Cash Inflow after tax	45000	165000
2	Cash Inflow after tax	55000	112000
3	Cash Inflow after tax	88000	99000
4	Cash Inflow after tax	99000	72000
5	Cash Inflow after tax	110000	62000
6	Cash Inflow after tax	150000	40000

Solution using the Six steps : for Project 2

6 Steps to find IRR in a shortest way

Step 1 **Find** $\frac{\text{Average Cash In Flow}}{\text{Cash Outlay}}$ **X 0.5 X 100**

$\frac{105417}{415000}$ X .5 X 100 = 12.70

Step 2 **The Rate found in the previous step should be rounded up to the Next integer and Calculate the NPV using this rate**

Rounded off to 13.00 %

Year	Cash Flow	Pv Factor @ 13.00	Present Value
1	82500	0.8850	73009
1	165000	0.8850	146018
2	112000	0.7831	87712
3	99000	0.6931	68612
4	72000	0.6133	44159
5	62000	0.5428	33651

6	40000	0.4803	19213
			472374
T = 0	Less: Cash outlay	1	415000
	NPV		57374

Step 3 **Find** $\frac{\text{NPV found in Step 2}}{\text{Outlay}}$ **X 100**

Round this % up to the next integer. Here we have to ignore the sign (-/+)

$$\frac{57374}{415000} \quad X\ 100 * 0.5 = \quad 6.91$$

Round the result to 7.00 %

Step 4 **The % found in Step 3 should be deducted / added with the rate found in the step 2 depending upon the -/+ sign of the NPV we got in Step 2**

As we have got " + NPV" in step 2 we have to add 7 % to 13 %

We get 20.00 %

Step 5 **Find the NPV using the rate got in Step 4**

		Pv Factor @	
Year	**Cash Flow**	**20.00**	**Present Value**
1	82500	0.8333	68750
1	165000	0.8333	137500
2	112000	0.6944	77778
3	99000	0.5787	57292
4	72000	0.4823	34722
5	62000	0.4019	24916
6	40000	0.3349	13396
	Total		**414354**
T = 0	Less : Cash outlay	1	415000
	NPV		-646

Step 6 **Use interpolation method to find the IRR**

$$X = X1 + \frac{X2-X1}{Y2-Y1} \times (Y-Y1)$$

	Rate	NPV	
X1	13	57374	Y1

X2	20	-646	Y2

$$X = 13 + \frac{20-13}{-646-57374} \times (0 - 57374)$$

13 6.92

= 19.92

(here the " - " sign in " -646" should be considered)

IRR = 19.92 % (approx)

As per excel calculation we may get 19.9 % as IRR

Rgs

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