

**COMPARISON BETWEEN NET PRESENT VALUE AND INTERNAL RATE OF RETURN****Dr. Balaram Bora**

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**ABSTRACT:**

Decisions in capital investment will have major impact on the future well-being of the firm. Normally NPV and IRR measurements to evaluate projects often results in the same findings. However, there are a number of projects for which using IRR is not as effective as using NPV to discount cash flows. This study objective is to analyze conflicting areas between NPV and IRR.

In analyzing conflicting areas between NPV and IRR, this paper has been divided into seven parts. In the first part Introduction, Second part objectives, Third part Review of literature, Fourth part theoretical aspects of NPV and IRR, Fifth part types of investment decisions, in the sixth part Comparison between NPV and IRR and in the last part conclusion. The conclusion is both NPV and IRR methods are equivalent as regards the acceptance or rejection of independent conventional investments. Investment projects in the case of lending, Higher rate earned project is preferable, Whereas in the case of borrowing Lower rate paid project is preferred. The IRR rule may also lead multiple rates of return for non-conventional project and fails to work under varying cost of capital conditions. Under a number of situations (at timing of cash flows, scale of investment, or project life span), the IRR rule can give a misleading signal for mutually exclusive projects. Since the IRR violates the value additivity principle; since it may fail to maximise wealth under certain conditions; and since it is cumbersome, the use of the NPV rule is recommended. In case of mutually exclusive projects having unequal lives, project can be selected on the basis of Annualized NPV and the project which is having higher Annualized NPV( based on Cash Inflows) or lower Annualized NPV(based on Cash Outflows) should be selected. Even though All do not accept, Advocates of reinvestment assumption calculates terminal values of the project to prove their point through Modified Internal Rate of Return. There is no problem in using the NPV method when the opportunity cost of capital varies over time. Cash flows should be adjusted to accommodate the inflation factor so that the capital budgeting decisions reflect the true picture.

**Keywords:** Net Present Value(NPV), Internal Rate of Return(IRR), Benefit cost ratio (BCR), Payback period (PB), Accounting rate of return (ARR), Modified Internal Rate of Return (MIRR), Incremental approach.

**Introduction:**

Capital investment decisions, which involve commitments for large outlays whose benefits (or drawbacks) extend well into the future, are of great significance to a firm. Decisions in these areas will therefore have major impact on the future well-being of the firm<sup>1</sup>. In capital budgeting, there are a number of different approaches that can be used to evaluate any given project, and each approach has its own distinct advantages and disadvantages. Investment criteria fall into two categories: discounting criteria and non-discounting criteria. Net present value (NPV), Benefit cost ratio (BCR), and Internal Rate of Return (IRR), are the most popular discounting criteria. Payback period (PB) and Accounting rate of return (ARR) are the major non-discounting criteria<sup>2</sup>. NPV and IRR are the most important criteria in practice with ARR

and PB being used as supplementary criteria. All other things being equal, using NPV and IRR measurements to evaluate projects often results in the same findings. However, there are a number of projects for which using IRR is not as effective as using NPV to discount cash flows. IRR's major limitation is also its greatest strength: it uses one single discount rate to evaluate every investment.

### Objectives of the study:

The purpose of this study is to develop a technique enabling objective decisions under the conflict of results obtained through employment of the NPV and of IRR methods.

- (i) To learn the system of NPV and IRR.
- (ii) Review the preference of authors to NPV than IRR.
- (iii) Access the gap and facts between NPV and IRR.

### Review of literature:

There are Graham and Harvey<sup>3</sup> surveyed 392 CFO's about financial policies used by the financial decision makers. They conducted a survey of CFO's about the application of financial theory in the use of capital budgeting, cost of capital, and capital structure decision making. He find that 75.7% (297) of survey respondents use IRR and 74.9% (294) of survey respondents use NPV to make capital budgeting decisions. Thus, most corporate financial decision makers use both IRR and NPV in making capital budgeting decisions. The use of both capital budgeting decision techniques may lead to conflicting answers when a time disparity and mutually exclusive conflict occurs.

On another side it was describes that NPV and IRR differ in two ways. First, NPV assumes that cash inflows are reinvested at required rate of return, whereas IRR assumes that cash inflows are reinvested at computed IRR. To reinvest at required rate of return is more realistic and provide reliable results when comparing mutually exclusive projects. Second NPV measures profitability in absolute manner and IRR measures in relative manner (Heitger, Mowen, & Hansen <sup>4</sup>). On the other place it was also argued that in some cases IRR is better and in some cases NPV is better but concluded with superiority of NPV. For independent project NPV and IRR reaches the same result, if projects are mutually exclusive and different in size than NPV is best because it selects the project that maximizes the value. At conclusion it was said that NPV is better than IRR for competitive projects (Brigham, Daves<sup>5</sup>)

In a study of the capital budgeting practices of fourteen medium to large size companies in India, it was found that all companies , except one, used payback. With payback and /or other techniques, about two-thirds of companies used IRR and about two-fifths NPV. IRR was found to be the second most popular method<sup>6</sup>. A survey of corporate finance practices in india by manoj anand revealed that the IRR 85%, PB 67.5%, NPV 66.3%, Break even analysis 58.2% and PB 35.1% are followed by companies to evaluate investment proposals<sup>7</sup>.

Two criteria for choosing between capital investment projects are net present value (NPV) and internal rate of return (IRR). Sometimes they provide inconsistent rankings. This inconsistency sparked a debate about which criterion is better. The debate has lasted more than 100 years. Michael J. Osborne<sup>8</sup> describes a new approach to the debate. The time value of money equation is a polynomial, and a polynomial of order  $n$  does not have a single root. It has  $n$  roots. The result of taking into account the  $n$  solutions for IRR is a new equation for NPV that suggests a resolution to the debate.

Capital budgeting plays an essential role in a firm's long-term viability and survival. The capital budgeting process includes: identification of potential projects, prediction of possible outcomes, project selection, financing and implementation of the chosen project, and monitoring project performance (Mukherjee and Henderson, 1987). Although economic

considerations should govern the capital budgeting decision, individual opinions and preferences often become primary factors affecting project selection (C.S. Agnes Cheng, D. Kite, R. Radtke<sup>9</sup>)

It is well known that internal rate of return (*IRR*) and net present value (*NPV*) rankings of mutually exclusive investments are sometimes inconsistent. This inconsistency, when it occurs, requires decision makers to choose between the two ranking methods. The purpose of this paper is to deduce sufficient conditions for consistent *IRR* and *NPV* investment rankings of mutually exclusive investments. Lindon J. Robison<sup>10</sup> in their paper suggests the appropriate criteria for selecting a particular method for ranking mutually exclusive investments.

### Theory of Net Present Value (NPV) and Internal Rate of Return (IRR):

NET PRESENT VALUE: Net Present Value method is one of the discounted cash flow techniques, which takes into account the time value of money. Net Present Value refers to the difference between the present value of all cash inflows and present value of all cash out flows associated with the project<sup>11</sup>. The present value is ascertained using the firm's overall cost of capital as the discount rate. The formula for the net present value can be written as follows:

$$NPV = \left[ \frac{C_1}{(1+k)} + \frac{C_2}{(1+k)^2} + \frac{C_3}{(1+k)^3} + \dots + \frac{C_n}{(1+k)^n} \right] - C_0$$

$$NPV = \sum_{t=1}^n \frac{C_t}{(1+k)^t} - C_0$$

Here  $C_1, C_2, C_3, \dots, C_n$  = annual cash inflows,  $K$  = Discount factor;  $t$  = time period (year numbers) and  $C_0$  = initial investment (cash out flow).

The acceptance rule of NPV is accept the project when NPV is positive ( $NPV > 0$ ); reject the project when NPV is negative ( $NPV < 0$ ) and may accept the project when NPV is zero ( $NPV = 0$ ).

The advantages are (i) it considers all cash flows, (ii) it is a true measure of profitability, (iii) it is based on the concept of the time value of money, (iv) it satisfies the value additive principle. (i.e., NPV's two or more projects can be added.) and (v) it is consistent with the shareholder's wealth maximization principle. The disadvantages are (i) it requires estimates of cash flows which is a tedious task, (ii) it requires computation of opportunity cost of capital which poses practical difficulties and (iii) it is sensitive to discount rates value of money.

INTERNAL RATE OF RETURN:

Internal Rate of Return is that rate at which the sum of discounted cash inflows equals the sum of discounted cash out flows. It is rate of return which equates the present value of cash inflows to present value of cash out flows. Here in this method discount rate may not be known but cash inflows and out flows are known. That rate has to be found that is IRR. This also implies that the rate of return is the discount rate which makes  $NPV = 0$ . The formula for the Internal Rate of Return can be written as follows:

$$C_0 = \left[ \frac{C_1}{(1+k)} + \frac{C_2}{(1+k)^2} + \frac{C_3}{(1+k)^3} + \dots + \frac{C_n}{(1+k)^n} \right]$$

$$C_0 = \sum_{t=1}^n \frac{C_t}{(1+k)^t}$$

$$\sum_{t=1}^n \frac{C_t}{(1+k)^t} - C_0 = 0$$

The acceptance rule of IRR is If  $IRR > \text{cost of capital (k)}$  then project will be accepted. If  $IRR < \text{cost of capital (k)}$  then project will be rejected, and If  $IRR = \text{cost of capital (k)}$  then project will not get profits and will not incurred losses also.

The advantages of IRR is (i) it considers all cash flows, (ii) it is a True measure of profitability, (iii) Based on the concept of time value of money, and (iv) Generally, consist with wealth maximization principle. The disadvantages are (i) Requires estimates of cash flows which is a tedious task, (ii) Does not hold the value additive principle. (i.e., IRRs two or more projects does not add.) (iii) At times fails to indicate correct choice between mutually exclusive projects, (iv) At time yields multiple rates and (v) it is Relatively difficult to compute.

NPV vs IRR:

The methods of net present value (NPV) and of internal rate of return (IRR) are among the ones most frequently employed in the evaluation of investment projects based on discounted cash flow. The methods have a universal character, strong methodological basis and broad application in the areas of investment project evaluation. Somewhere, the degree of reliability of the methods is equal; therefore, sometimes only one of them is used, with the decision adopted on the basis of a single indicator. The strengths and weaknesses of both NPV and IRR can be seen from the Table-1.

**TABLE-1: STRENGTHS AND WEAKNESSES OF THE NPV AND IRR METHODS<sup>12</sup>:**

STRENGTHS	WEAKNESSES
<b>NPV METHOD</b>	
One of the key and most widespread methods of investment evaluation, which means that most analysts and investors are aware of it and understand it.	As an absolute indicator, it does not show the profitability (effectiveness) of an investment project.
Reflects the return on capital investments in the best and clearest way.	High dependence of the indicator on the discount rate selected. With a high discount rate, future cash flows have little influence on the NPV. In addition, one cannot always determine the discount rate objectively.
Shows the present value of money, taking account of the effect of the time factor expressed in the form of discount rate.	Discount rate is usually set the same for the entire project implementation period even though it may be subject to change if the market situation changes in the future.
Uses the entire life cycle of an investment project in calculations, taking account of cash flows generated in different periods of time.	Requires reliable long-term forecasts.
A scientifically substantiated indicator enabling an objective evaluation of projects.	The indicator is not very suitable for analysing projects with the same NPV but with different initial investments.
Presents a forecast change in business value upon completion of the investment project.	Does not reflect the investment project's security reserve.
Additive feature of the indicator (possibility to sum the NPV of individual projects to evaluate the project portfolio).	The NPV indicator shows the absolute value of the effect, i. E. The size of alternative investments is not taken into account.

Enables evaluation of projects requiring multiple investments.	
<b>STRENGTHS</b>	<b>WEAKNESSES</b>
<b>IRR METHOD</b>	
Results of its application are informative, objective and independent of the size of alternative investments.	Not suitable as a criterion for the rating of projects according to absolute profitability.
Shows the minimal guaranteed limit of profitability of an investment project.	Calculations are difficult without IT tools.
Enables comparison of projects with different risk levels – a project with a higher risk must have a higher IRR value.	Highly sensitive to the accuracy and reliability of calculation of future cash flows from the project.
Shows the investment project's security reserve much better than NPV.	Additional difficulties related to project selection when the result of calculations shows more than one IRR value.
Enables rating projects according to their relative economic effectiveness.	Not suitable for projects with a non-typical distribution of cash flows.
Most suitable for comparisons with the results of both alternative investment projects and alternative investments in deposits, government securities, etc.	Calculation is based on the non-linear function, therefore, it has no additive feature (no possibility to sum IRRs of several projects).
Shows the limit borrowing costs at which the project remains profitable.	Selection of a too high limit of desired profitability by the investor can result in rejection of part of effective projects.
	Reflects the effectiveness of a project appropriately, provided that the profit from the project is reinvested at the same profitability rate, which occurs quite infrequently in practice – part of the profit is allocated for dividend, part is invested in another project which bears a lower risk but is less profitable at the same time.

Source: Jonas Mackevičius and Vladislav Tomašević (2010)

Normally, priority is given to the IRR method which is more understandable and obvious to investors as an indicator demonstrating the limit profitability of the project. In most cases, the results of both NPV and IRR analyses are the same; however, conclusions may differ in case of evaluation of non-typical investment projects. A situation where the project evaluation indicators produce opposite results is called a conflict of the IRR and NPV methods. It is under these cases that a choice between the two criteria has to be made.

#### **TYPES OF INVESTMENT DECISIONS:**

There are many ways of to classify investments. One classification is Expansion of existing or new business and Replacement and Modernization. Another useful way is to classify investments is Independent, Mutually Exclusive Projects and contingent projects.

a) Independent Projects: The acceptance or rejection of one does not directly eliminate other projects from consideration or cause the likelihood of their selection. Examples would include (i) The introduction of a new product line (soap) and at the same time the replacement of a machine, which is currently producing a different product (plastic bottles)(ii)The installation of a new air conditioning system and the commissioning of a new advertising campaign for a product currently sold by the firm.

b) Mutually Exclusive Projects: The acceptance of one prevents the acceptance of an alternative proposal. That is, two or more projects cannot be pursued simultaneously. Example would include: A firm may own a block of land, which is large enough to establish a shoe manufacturing business or a steel fabrication plant. The selection of one will exclude the acceptance of the other. The NPV method can be used to select between mutually exclusive projects; the one with the higher NPV should be selected.

c) Contingent Projects: The acceptance or rejection of one is dependent on the decision to accept or reject one or more other projects. Contingent projects may be complementary or substitute. Example The decision to start a pharmacy may be contingent upon a decision to establish a doctors' surgery in an adjacent building. The cash flows of the pharmacy will be enhanced by the existence of a nearby surgery and *vice versa*.

### COMPARISON BETWEEN NPV AND IRR<sup>13</sup>:

It is important to distinguish between conventional and non-conventional investments in discussing the comparison between NPV and IRR methods. A *conventional investment* has cash flows the pattern of an initial cash outlay followed by cash inflows. Conventional projects have only one change in the sign of cash flows; for example, the initial outflow followed by inflows, i.e.  $- + + +$ . A *non-conventional investment*, on the other hand, has cash outflows mingled with cash inflows throughout the life of the project. Non-conventional investments have more than one change in the signs of cash flows; for example,  $- + + + - + + - +$ .

### CASE OF CONVENTIONAL INDEPENDENT PROJECTS:

In case of conventional investments, which are economically *independent* of each other, NPV and IRR methods result in same accept-or-reject decision if the firm is not constrained for funds in accepting all profitable projects. Thus, we find that NPV and IRR methods are equivalent as regards the acceptance or rejection of independent conventional investments.

### LENDING AND BORROWING TYPE PROJECTS:

NPV of the project declines as the discount rate increases. It may not be true in the case of all projects. Investment projects may have the characteristics of lending or borrowing or both. Consider the following situations. Project with initial outflow followed by inflows is a *lending type project (X)*, and project with initial inflow followed by outflows is a *borrowing type project (Y)*, Both are conventional projects.

TABLE-2: LENDING AND BORROWING TYPE PROJECTS

PROJECT	Cash flows(Rs.)		NPV			IRR
	CO	C1	10%	20%	30%	
X	-100	120	9	0	-7.7	20%
Y	100	-120	-9	0	7.7	20%

For project-X , the NPV declines as the discount rate increases. The NPV is zero at 20%, and it is

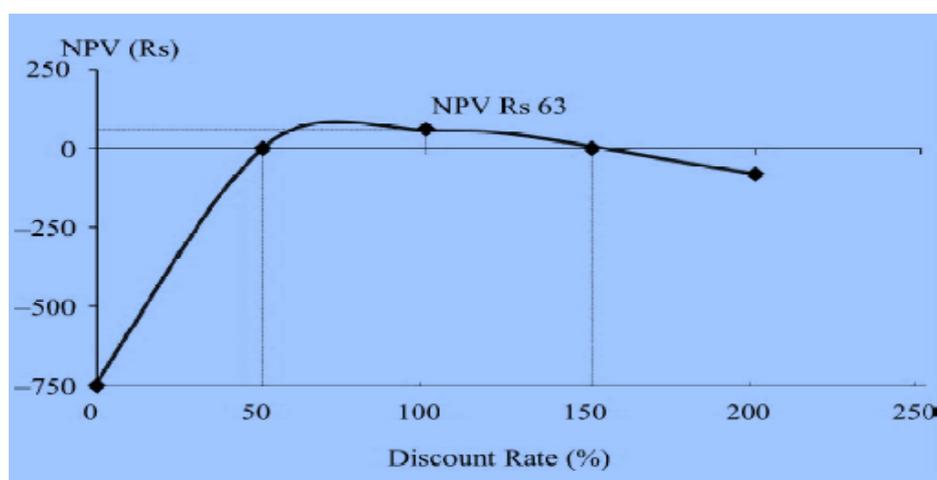
positive for rates lower than 20% and negative for rates higher than 20%. In this case, Higher rate earned project is preferred. Whereas For project-Y it is opposite and in this case the Lower rate paid project is preferred.

### NON-CONVENTIONAL INVESTMENTS:

**PROBLEM OF MULTIPLE IRRs:** A project may have both lending and borrowing features together. IRR method, when used to evaluate such non-conventional investment can yield multiple internal rates of return because of more than one change of signs in cash flows.

**TABLE-3: LENDING AND BORROWING TYPE PROJECTS**

PROJECT	Cash flows(Rs.)			NPV				
	CO	C1	C2	0%	50%	100%	150%	200%
I	-1000	4000	-3750	-750	0	63	0	-63



**Figure: 1. Problem of Multiple IRRs.**

At zero rate of discount, the NPV of the project is simply the difference of undiscounted cash flows. As the discount rate increases, the negative NPV diminishes and becomes zero at 50%. The positive NPV increases as discount rate exceeds 50%, but after reaching a maximum it starts decreasing and at 150% it again becomes zero. The above project combines the features of both lending and borrowing. The first part of the figure has an upward slope typical of a loan; the second part has a downward slope typical of an ordinary investment (lending). Since the NPV curves cuts the horizontal axis twice, the project has two rates of return, 50 and 150 percent. Which of the two rates is correct? None. The project would be worthwhile only when the opportunity cost of the capital falls between these two rates. The straight forward alternative is to use the NPV rule.

### CASE OF RANKING MUTUALLY EXCLUSIVE PROJECTS:

Investment projects are said to be mutually exclusive when only one investment could be accepted and others would have to be excluded. Ex: In order to distribute its products, a company may decide either to establish its own sales organisation or engage outside distributors. Two independent projects may also be mutually exclusive if a financial constraint is imposed. Ex: If limited funds are available to accept either project-A or project-B, this would be an example of capital rationing or financial exclusiveness. In case of Independent projects,

ranking is not important because all profitable projects will be accepted. Ranking of projects becomes crucial in mutually exclusive projects.

The NPV and IRR rules give conflicting ranking to the Mutually exclusive projects under the following conditions: (i) The cash flow pattern of the projects may differ. That is, the cash flows of one project may increase over time, while those of others may decrease or *vice-versa*. (ii) The cash outlays (initial investment) of the projects may differ, and (iii) The projects may have different expected lives.

#### (i) TIMING OF CASH FLOWS:

The most commonly found condition for the conflict between the NPV and IRR methods is the difference in the timing of cash flows. Let us consider the following two Projects, M and N.

**TABLE-4: TIMING OF CASH FLOWS**

PROJECT	Cash flows (Rs.)				NPV at 9%	IRR
	C0	C1	C2	C3		
M	-1,680	1,400	700	140	301	23%
N	-1,680	140	840	1,510	321	17%

Which project should we choose between projects M and N? Both projects generate positive NPV at 9% cost of capital. Therefore, both are profitable. But project N is better since it has a higher NPV. The IRR rule indicates that we should choose project-N, as it has higher IRR. If we choose project-N following the NPV rule, we shall be richer by an additional value of Rs 20. Should we have the satisfaction of earning a higher rate of return, or should we like to be richer? The NPV rule is consistent with the objective of maximizing wealth. When we have to choose between mutually exclusive projects, the easiest procedure is to compare the NPVs of the projects and choose the one with the larger NPV.

#### INCREMENTAL APPROACH:

It is argued that the IRR method can still be used to choose between mutually exclusive projects if we adapt it to calculate rate of return on the incremental cash flows. If we prefer to project-N to project-M there should be incremental benefits in doing so. To see this let us calculate the incremental cash flows of project-N over project-M. We obtain the following cash flows:

**TABLE-5: INCREMENTAL APPROACH:**

Project	Cash flows(Rs)				NPV at 9%	IRR
	C0	C1	C2	C3		
(M-N)	0	-1260	140	1370	20	10%

Project N is better than M despite its lower IRR because it offers all benefits that project M offers plus the opportunity of an incremental investment at 10% a rate higher than the required rate of return of 9%. It may be noticed that the NPV of the incremental flows is the difference of the NPV of the project N over that of project-M; this is so because of the value additively principle. The incremental approach is a satisfactory way of salvaging the IRR rule. But the series of incremental cash flows may result in negative and positive cash flows. This would result in multiple rates of return and ultimately the NPV method will have to be used.

#### (ii) SCALE OF INVESTMENT:

Another condition under contradictory ranking to the projects under NPV and IRR, is when the cash outlays are of different sizes.

**TABLE-6 : SCALE OF INVESTMENT**

Project s	Cash flows(Rs)	NPV at 10%	IRR
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	C0	C1		
A	-1000	1500	364	50%
B	-100000	120000	9091	20%
(B-A)	-99000	118500	8727	19.7%

As the IRR gives ambiguous results, NPV of project-B is high, it should be accepted. The same results will be obtained if we calculate the IRR on the incremental investment. The incremental investment of Rs. 99,000 will generate cash inflow of Rs. 1,18,500 after a year. Thus the return on the incremental investment is 19.7%, which is in excess of the 10% required rate of return. We should therefore prefer project-B to project-A.

### (iii) PROJECT LIFE SPAN:

Difference in the life spans of two mutually exclusive projects can also give rise to the conflict between the NPV and IRR rules. To illustrate, let us consider two mutually exclusive projects X and Y of significantly different expected lives.

**TABLE-7 : SCALE OF INVESTMENT**

Projects	Cash flows (Rs)						NPV@10%	IRR
	C0	C1	C2	C3	C4	C5		
X	-10,000	12000	-	-	-	-	909	20%
Y	-10,000	0	0	0	0	20,120	2,493	15%

Thus two methods rank the projects differently. The NPV rule can be used to choose between the projects since it is always consistent with the wealth Maximization principle. Thus, project-Y should be preferred since it has higher NPV. In case of mutually exclusive Projects having unequal lives, 'Annualized NPV' criterion should be used and the project having higher Annualized NPV (based on Cash Inflows) or lower Annualized NPV (based on Cash Outflows) should be selected. Annualized NPV can be calculated by NPV divided by cumulative present value of rupee per annum @cost of capital for the project or Present value of annuity @cost of capital and no. of years.

### REINVESTMENT ASSUMPTION:

The NPV and IRR rule are sometimes assumed that rest on an underlying implicit about reinvestment cash flows generated during the lifetime of the projects. It is contended that the source of conflict between the two techniques lies in their different implicit reinvestment rates<sup>14</sup>. The IRR method is assumed to imply that the cash flows generated by the project can be reinvested at its internal rate of return, whereas the NPV method is thought to assume that the cash flows are reinvested at the opportunity cost of capital. Advocates of reinvestment assumption calculate terminal values of the project to prove their point. This is a Modified Internal Rate of Return (MIRR). All do not accept the implicit reinvestment assumption because the source of the implicit reinvestment assumption lies in the use of compounding the cash flows to the terminal date of a project, instead of the use of discounting the starting date<sup>15</sup>. Anyhow the profitability of the project under consideration currently remains unaffected by such reinvestments of cash flows. The reason for the ranking- conflict between the IRR and NPV rules lies in the different timing of the projects' cash flows, rather than in the wrongly conceived reinvestment assumption.

### VARYING OPPORTUNITY COST OF CAPITAL:

The opportunity cost of capital remains constant over time may not be true in reality. If the opportunity cost of capital varies over time, the use of IRR rule creates problems, as there is not a unique benchmark opportunity cost of capital to compare with IRR. There is no problem in

using the NPV method when the opportunity cost of capital varies over time. with several opportunity costs do we compare the IRR to accept or reject an investment project is a difficult task . It is however, much easier to calculate the NPV with several opportunity costs.

### INFLATION AND CAPITAL BUDGETING<sup>16</sup>:

The capital budgeting results would be unrealistic if the impact of inflation is not correctly factored in the analysis. The cash flow estimates will not reflect the real purchasing power. Therefore cash flows should be adjusted to accommodate the inflation factor so that the capital budgeting decisions reflect the true picture. Real cash flows are cash flows discounted/deflated to reflect effect of inflation on nominal cash flows. Real cost of capital is cost of capital adjusted for inflation effect. When estimates of Cash Flows After Taxes(CFAT) and cost of capital include inflation, they are said to be expressed in nominal terms, when such estimates exclude the impact of inflation , they are said to be shown in real terms .

### CONCLUSION:

We find that NPV and IRR methods are equivalent as regards the acceptance or rejection of independent conventional investments. Investment projects in the case of lending , Higher rate earned project is preferable, Whereas in the case of borrowing Lower rate paid project is preferred. The IRR rule may also lead multiple rates of return for non-conventional project and fails to work under varying cost of capital conditions. Under a number of situations (at timing of cash flows, scale of investment, or project life span), the IRR rule can give a misleading signal for mutually exclusive projects. Since the IRR violates the value additively principle; since it may fail to maximise wealth under certain conditions; and since it is cumbersome, the use of the NPV rule is recommended. In case of mutually exclusive projects having unequal lives, project can be selected on the basis of Annualized NPV and the project which is having higher Annualized NPV( based on Cash Inflows) or lower Annualized NPV(based on Cash Outflows) should be selected. Even though All do not accept , Advocates of reinvestment assumption calculates terminal values of the project to prove their point through Modified Internal Rate of Return. There is no problem in using the NPV method when the opportunity cost of capital varies over time. Cash flows should be adjusted to accommodate the inflation factor so that the capital budgeting decisions reflect the true picture.

### REFERENCES:

- [1] Weaver Samuel C. & Weston J Fred.(2009), "Strategic Corporate Finance", 2nd Indian Reprint., *South Western(Cengage Learning)*, New Delhi. pp.284-320
- [2]. Chandra Prasanna,(2011), "Financial Management-Theory and Practice", 8th Edition, *Tata Mcgraw Hill Publishing Company Limited*, New Delhi. Pp.281-304
- [3] Graham, John R. and Campbell R. Harvey. (2001) "The Theory and Practice of Corporate Finance: Evidence from the Field," *Journal of Financial Economics*, 60, pp. 187-243.
- [4]Heitger.D.L, Mowen.M.M, and Hansen.D.R, (2007). *Fundamental Cornerstones of Managerial Accounting* (p. 651). USA: Cengage Learning.
- [5] Brigham P. D. Daves, & Daves, (2012).*Intermediate Financial Management* USA: Cengage Learning.
- [6] Pandey, I.M., (jan.1989) *Capital Budgeting Practices of Indian Companies*, MDI Management Journal, Vol.2, No.1.
- [7] Manoj Anand , (*October-December 2002* ), *Corporate Finance Practices in India: A Survey Vikalpa* Vol. 27, No. 4, pp.29-56
- [8] Michael J. Osborne (2010) "A resolution to the NPV-IRR debate?", *The Quarterly Review of Economics and Finance*, Volume 50, Issue 2, May 2010, Pages 234-239
- [9] C.S. Agnes Cheng, D. Kite, R. Radtke, (1994) "The Applicability and Usage of NPV and IRR capital budgeting techniques", *Managerial Finance*, Vol. 20 Iss: 7, pp.10 - 36

- [10] Lindon J. Robison , Peter J. Barry , Robert J. Myers , (2015) "Consistent IRR and NPV rankings", *Agricultural Finance Review*, Vol. 75 Iss: 4, pp.499 - 513
- [11]. Tulsian. P.C. (2010) *Financial Management*, 2nd Revised Edition, , *S.Chand & Company Ltd*, New Delhi. Pp.3.1-3.164
- [12] Jonas Mackevičius and Vladislav Tomašević (2010) "Evaluation of Investment Projects in Case of Conflict between the Internal Rate of Return and the Net Present Value Methods" *Ekonomika* Vol. 89(4) , pp.116-130.
- [13]. Pandey I M, (2010), "Financial Management", 10th Edition, *Vikas Publishing House Private Limited*, New Delhi.pp158-188.
- [14]Rangarajan, C. and Paul Mampilly, Net Present Value vs Internal Rate of Return, *Economic and Political Weekly*, Nov.27,1971,pp.M-153-56 and Gupta, L.C, A comment, , *Economic and Political Weekly*,Feb.27,1972, and "Further Comment", May 6,1972.
- [15] Gupta,op.cit.,1972.
- [16]. Khan M Y & Jain P K, (2004), "Financial Management- Text, problems and Cases", 4th Edition, *Tata Mcgraw Hill Publishing Company Limited*, New Delhi. p.p 11.1-11.51.