Asian Journal of Economics, Business and Accounting

13(2): 1-10, 2019; Article no.AJEBA.53056
ISSN: 2456-639X

Capital Budgeting Techniques: Estimation of Internal Rate of Returns

Agbeye, Seyi John[1*]

[1]Department of Accounting, Faculty of Business Administration, University of Uyo, Uyo, Nigeria.

Author's contribution

The sole author designed, analysed, interpreted and prepared the manuscript.

Article Information

DOI: 10.9734/AJEBA/2019/v13i230167
Editor(s):
(1) Dr. Vasilii Erokhin, School of Economics and Management, Harbin Engineering University, China.
(2) Dr. María-Dolores Guillamón, Department of Financial Economics and Accounting, University of Murcia, Spain.
Reviewers:
(1) Antipas T. S. Massawe, University of Dar Es Salaam, Tanzania.
(2) Imam Mukhlis, Universitas Negeri Malang, Indonesia.
(3) Emezi, Charles Nwaneri, Federal Polytechnic Nekede Owerri, Nigeria.
Complete Peer review History: http://www.sdiarticle4.com/review-history/53056

Original Research Article

Received 01 October 2019
Accepted 09 December 2019
Published 16 December 2019

ABSTRACT

The enormity of costs associated with long-term assets and the length of exposure to risk of such investments makes it essential to properly evaluate capital budgeting decisions before embarking on them. The estimation of cash flows of uncertain future period itself is problematic and to add a complex technique of project evaluation that will require trial and error could be frustrating. This study is to simplify the estimation of Internal Rate of Return (IRR) without going through the rigours of trial and error process. This study is a method article on the estimation of IRR. The study allows the estimation of IRR even when net present value at two levels are positive or the two are negative instead of the use of interpolation. Investments analysists were advised to properly evaluate projects so that investors will source for funds where the interest rate is lower than the projects' IRR.

Keywords: Capital budgeting; internal rate of return; discounted cash flow; complexity.

1. INTRODUCTION

Capital budgeting is the investment in long term assets. Firms invest in long term assets to continue to exist, grow and maximize the wealth of the owners. Investments in long term assets involve huge amount, are irreversible or expensive to reverse and exposes the

**Corresponding author: E-mail: seyiagbeye@yahoo.com;*

investment to long term risk. The success and failure of business mainly depends on how the available resources are being utilised [1]. The evaluation of capital budgeting decisions is also called investment appraisal. According to [2], investment appraisal is the evaluation of investments with regards to their profitability and/or cost of effectiveness. [3] state that capital budgeting is capital allocating because it is used to determine whether future benefits are sufficiently large to justify the initial outlays. [4] defines capital budgeting as investment in a project with the expectation of a stream of benefits extending far into the future with long term consequences involving substantial outlays that are difficult or expensive to reverse.

According to [5], Capital budgeting creates measurability and emphasizes accountability by providing financial analysis to support key business decisions. Capital budgeting decisions are very important for financial managers, since they determine the choice of investment projects that will affect company value [6]. Capital investments can be risky because of the huge outlays, uncertainty of benefits and the difficulty in reversing them [7]. There is therefore a great need to evaluate capital budgeting decisions. Capital budgeting evaluation is the process of analysing projects and deciding which ones to include in capital budget [1]. No matter how capital budgeting is defined or explained, the underlining factor is that capital budgeting involves evaluation of investment of a firm's resources in the current period so as to increase the wealth of the owners of the business and improve the well-being of the society by contributing to the expansion of the economy of the nation in which the firm operates.

The evaluation of capital budgeting decisions involve the application of some techniques often divided into traditional and discounted cash flow methods. The traditional methods are Accounting Rate of Returns (ARR) and the Payback Period (PBP) while the discounted cash flow methods are the Net Present Value (NPV) and the Internal Rate of Returns (IRR). The application of capital budgeting techniques is the art of finding assets that are worth more than they cost [8]. Capital budgeting techniques assist in identifying a project viability (economic value) and not just feasibility (technical possibility) [9].

Of all the four techniques stated earlier, the IRR is the most complex. In fact, it is more correct to say that IRR is estimated rather than calculated [10]. IRR is often estimated by interpolation after trial and error use of rates of return. This complexity makes the estimation of IRR to be dreaded by students and even investment analysists. However, previous studies emphasize that the discounted cash flow methods which are NPV and IRR are the most accurate and useful techniques. This paper is therefore an attempt at contributing to the literature on capital budgeting decisions by profiling a method of estimating the IRR of a project without resulting to trial and error method.

2. CONCEPT OF INTERNAL RATE OF RETURNS

The Internal Rate of Returns (IRR) which is also called discounted cash flow yield method is the rate of returns that equates the present values of cash inflows to the present value of cash outflows from a project. In a nutshell, IRR is the breakeven rate of return on a project. When the IRR is applied on a project, the project generates net present value of zero. The IRR of a project is the discounted rate of return on the investment [10]. IRR is also called time-adjusted rate of return because it is used to evaluate projects by determining the percentage return on the investment.

IRR is used by managers as a result of its ability to rank projects as well as being able to inform managers of the increase or otherwise in the company's value from an investment [11]. There is evidence that large companies use IRR in their investment appraisal more importantly, companies with high growth opportunities, high leverage and high dividend pay-out [12,6]. IRR has a major advantage over the NPV in that it can be estimated without a known cost of capital (COC) for the company and subsequently compared with the cost of fund sourced for the project but NPV requires a COC before it can be calculated. IRR as one of the classified sophisticated capital budgeting techniques provide superior decisions for firms [13]. It is therefore, important that IRR be made easy to derive so that the benefits of its use can be enjoyed.

In the discounted cash flow methods of project evaluation, the NPV has a known cost of capital or rate of return that will generate NPV to be used in the evaluation of the project but IRR sort for the rate that will generate NPV of zero [14]. The determination of IRR requires two steps of first calculating NPV using any chosen discount rate and subsequently, choose (and keep trying)

a lower or higher rate to have NPV equal to zero, depending on whether the initial NPV is positive or negative [14]. [3] suggest a process of averaging by dividing cumulative cash flows by the life of the project. Thereafter, divide the investment by the average to derive present value factor that will give an idea of the range for the IRR from the annuity factor table. This process can be described as guess work and will still require trial and error.

Malomo [15] states that IRR is the expected earning rate of an investment and that if the IRR of a project exceeds the company's target rate of return for investments, the project should be considered viable. IRR is therefore a benchmark for determining viability of projects in comparison with what is expected from the project by firm owners. Malomo [15] states how to estimate IRR by first computing ARR and use the value gotten as the base for determining the rate to use. Subsequently, a trial and error is introduced with the following formula to be applied:

IRR=lower COC + Positive NPV/ Positive NPV + Negative NPV in absolute value x Difference in rates

Akinsulire [16] describes IRR as the cut off rate as it is the rate that break-even the cost of capital. A striking point by [16] is that if a company borrows at a rate higher than the IRR estimated, the project will eventually be rendered unviable. Consequently, the proper estimation of IRR is necessary such that investors should avoid expensive funds that will render their projects unviable.

IRR represents the yield on an investment and it is a discounted cash flow technique which takes account of the magnitude and timing of cash flows [17]. [17] posits that IRR depends solely on the outlay and proceeds associated with the investment and not on any rate determined outside the investment. The technique is called IRR because the rate of return depends on the project's cash flows rather than any outside factor [17]. The IRR represents the true interest rate earned on any investment over the course of its economic life and it is the maximum cost of capital that can be applied to finance a project without causing harm to the shareholders [18].

Drury [18] separates estimation of IRR of projects with even cash flow from projects with uneven cash flows. Cash flows are even if the same cash flows are generated annually over the entire life of the project. He posits that IRR of projects with even cash flows can be estimated simply by the following formula:

IRR = Investment cost/ Annual cash flows

The figure derived here can then be checked up from the annuity factor table.

For example, if XYZ Ltd has the following investment proposal:

Initial outlay is N100,000 while the annual cash flow is N40,000 for four years.

The IRR can be determined as follows:

Discount rate = 100,000/40,000
= 2.5

2.5 for year 4 lies between 21% and 22%. Consequently, these rates will be compared with the company's cost of capital (COC). As long as 21% is higher than the company's cost of capital, a decision can be taken on the viability of the project. As simple and straight forward as this process is, it is certain that cash flows from a project cannot be same over the entire life of the project. Consequently, attention should be focussed on uneven cash flows.

3. ESTIMATING IRR OF PROJECTS WITH UNEVEN CASH FLOWS

If IRR is the rate of returns that yields zero NPV when applied on an investments' cash flows, it means then that IRR lies between the rate that yields positive NPV and the rate that yields negative NPV. NPV has an inverse relationship with cost of capital; the higher the cost of capital, the lower the NPV. Lower cost of capital is therefore expected to yield positive NPV while higher cost of capital will yield negative NPV. Consequently, by interpolation, the mid-rate that will yield zero NPV can be estimated. This rate that yields zero NPV is the IRR. It must be noted that the closer the two rates chosen to the IRR, the less the error in estimation of IRR, hence, the continuous trial of rates.

Case Study 1:

The following information about a project is given as follows:

The initial outlay of the project is N106,000 while the net cash flows for the four years that the

project will last are; N34,000; N50,000; N32,000 and N24,000 respectively. The minimum desirable rate of returns for projects in the company is 11%.

Determine the viability of the project using IRR.

To begin with, generate NPV of 11% rate of returns as follows:

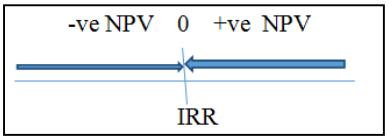

Fig. 1. Demonstration of the movement of NPV towards zero level

Source: Developed by Author (2019) from Literature Review

Please, note that the evaluation starts from year zero. Year zero here represents the beginning of the project. It is tagged year zero so that the discount factor will be one (1/1.11° = 1). The basis for this is that when considering time value of money, the value of the money with the investor at the beginning of the project remains what it is.

The NPV of the project at 11% is positive N4,418. Since this NPV is positive a rate of return higher than 11% should be applied to generate a negative NPV. It must be noted that N4,418 is a way from N0. However, consideration must be given to the relationship between the initial outlay and the NPV; the wider the gap, the closer is the NPV to zero. In this instance, the NPV is 4.17% of the initial outlay. As a result, I will select a rate of return of 13% to generate another NPV. This is as follows in Table 2.

From this, computation, 13% rate of return yields positive NPV of N143 although, very close to zero. Consequently, there is a need to use a higher rate of return. This is why it is called, trial and error. Since this NPV is close to zero, 14% rate of return will be expected to yield a negative NPV. Using 14% rate of return is presented in Table 3.

Table 1. Computation of NPV at 11% rate of return

Years	Cash flows	Discount factor @ 11%	Present values
0	(106,000)	1.0000	(106,000)
1	34,000	0.9009	30,631
2	50,000	0.8116	40,580
3	32,000	0.7312	23,398
4	24,000	0.6587	15,809
		NPV	**4,418**

Source: Author's Computation (2019)

Table 2. Computation of NPV at 13% rate of return

Years	Cash flows	Discount factor @ 13%	Present values
0	(106,000)	1.0000	(106,000)
1	34,000	0.8850	30,090
2	50,000	0.7831	39,155
3	32,000	0.6931	22,179
4	24,000	0.6133	14,719
		NPV	**143**

Source: Author's Computation (2019)

Table 3. Computation of NPV at 14% rate of return

Years	Cash flows	Discount factor @ 14%	Present values
0	(106,000)	1.0000	(106,000)
1	34,000	0.8772	29,825
2	50,000	0.7695	38,475
3	32,000	0.6750	21,600
4	24,000	0.5921	14,210
		NPV	**(1,890)**

Source: Author's Computation (2019)

Now that I have a negative NPV close to zero, by interpolation, the IRR can be estimated as follows:

$$IRR = 13 + \frac{143}{143 + 1890} \times (14 - 13)$$
$$= 13 + \frac{143}{2033} \times 1$$
$$= 13 + 0.0703$$
$$= 13.07\%$$

Decision: Since the IRR of 13.07% is higher than the COC of 11%, the project can be considered viable. This is because additional returns of 2.07% (13.07% - 11.00%) in excess of desirable returns will be earned.

4. JUSTIFICATION OF THE IRR

NPV at the internal rate of return of 13.07% is zero. This is the breakeven rate of returns. This rate must be equal to or greater than the company's cost of capital for the project to be viable.

Case Study 2:

It is also possible that the first two rates applied yield negative NPVs such as follows:

XYZ proposes to engage in the manufacture a product for household use. It is believe that the products from this project will be available in the market in the next five years. The initial outlay is N200,000 while outlay in year one is projected to be N120,000. Annual net cash flows in the next four years are estimated to be N50,000; N80,000; N120,000 and N150,000. The cost of capital for the company is 15%.

Determine the viability of the project using IRR.

5. COMPUTATION OF IRR

Since the NPV is negative, a lower rate of returns should be applied to generate positive NPV.

6. USING RATE OF RETURN OF 14%

Since 14% rate of returns yields a negative NPV, there is a need to use a lower rate of return so as to generate a positive NPV.

$$IRR = 13 + \frac{8,259}{8,259 + 845} \times (14 - 13)$$
$$= 13 + \frac{8,259}{9,104} \times 1$$
$$= 13 + 0.907$$
$$= 13.9\%$$

Decision: This project is not viable because the IRR is lower than the COC. If executed, a negative return of 1.1% will be incurred thereby, eroding the capital of the firm.

Table 4. Computation of NPV at 13.07% rate of return

Years	Cash flows	Discount factor @ 13.07%	Present values
0	(106,000)	1.0000	(106,000)
1	34,000	0.8844	30,070
2	50,000	0.7822	39,110
3	32,000	0.6918	22,137
4	24,000	0.6118	14,683
		NPV	0

Source: Author's Computation (2019)

Table 5. Computation of NPV at 15% rate of return

Years	Cash flows	Discount factor @ 15%	Present values
0	(200,000)	1.0000	(200,000)
1	(122,000)	0.8696	(106,091)
2	80,000	0.7561	60,488
3	100,000	0.6575	65,750
4	150,000	0.5718	85,770
5	170,000	0.4972	84,524
		NPV	**(9,559)**

Source: Author's Computation (2019)

Table 6. Computation of NPV at 14% rate of return

Years	Cash flows	Discount factor @ 14%	Present values
0	(200,000)	1.0000	(200,000)
1	(122,000)	0.8772	(107,081)
2	80,000	0.7695	61,560
3	100,000	0.6750	67,500
4	150,000	0.5921	88,815
5	170,000	0.5194	88,298
		NPV	**(845)**

Source: Author's Computation (2019)

Table 7. Computation of NPV at 13% rate of return

Years	Cash flows	Discount factor @ 13%	Present values
0	(200,000)	1.0000	(200,000)
1	(122,000)	0.8850	(107,970)
2	80,000	0.7831	62,648
3	100,000	0.6931	69,310
4	150,000	0.6133	91,995
5	170,000	0.5428	92,276
		NPV	**8,259**

Source: Author's Computation (2019)

7. MODEL FOR ESTIMATING IRR WITHOUT TRIAL AND ERROR

Estimation of IRR in this model requires NPV at two levels but will not require the use of interpolation or trial and error. The procedures for the estimation of IRR using this model is as follows:

(1) Compute NPV using two rates of return. Their results whether positive and positive or negative and negative do not matter.
(2) Compute the NPV of 1% rate of return as follows:

    Difference in NPV of the Two Rates/Difference in the two rates

(3) Compute the ratio of NPV of any of the rates earlier used to the NPV of 1% rate of return computed in step (2).
(4) The addition of ratio of NPV of any of the two rates to the rate chosen will yield the IRR if the NPV was positive:

    Rate + NPV of Rate ÷ Difference in NPV of the two rates/ Difference in the two rates

(5) If however, the NPVs are negative, deduct the ratio of NPV of the rate chosen to NPV of 1% from the chosen rate of return to derive the IRR:

    Rate – NPV of Rate ÷ Difference in NPV of the two rates/ Difference in the two rates

8. DEMONSTRATION OF THE MODEL

Using the examples earlier used to confirm the veracity of model:

The initial outlay of the project is N106,000 while the net cash flows for the four years that the project will last are; N34,000; N50,000; N32,000 and N24,000 respectively. The minimum desirable rate of returns for projects in the company is 11%. Estimate the viability of the project using IRR.

To begin with, generate NPV of 11% rate of returns as follows:

NPV at 11% is 4,418 and NPV at 13% is 143.

The NPV of 1% COC is determined as follows:

$$\frac{\text{Difference in NPV/ } (4418 - 143)}{\text{Difference in Rates } (13 - 11)} = \frac{4{,}275}{2} = 2{,}137.5$$

Therefore, the rate that will generate NPV of zero can be derived by adding ratio of NPV of 13% to NPV of 1%

NPV of 1% COC = 143/2,137.5
= 0.0669

+ IRR = 13 + 0.0669
= 13.07%

This is the same rate generated when interpolation was used through trial and error. The decision on the viability or otherwise of the project remains the same as earlier stated.

The lower rate can also be used to estimate the IRR with the same result.

Ratio of NPV of 11% to NPV of 1%
= 4,418/2,137.5
= 2.0669

+ IRR = 11 + 2.0669
= 13.0669
= 13.07%

9. ESTIMATION OF IRR WHEN NPVS ARE NEGATIVE AND NEGATIVE

The IRR can also be estimated even when the two NPVs are negative:

Using case study 2 earlier applied under trial and error:

XYZ proposes to engage in the manufacture a product for household use. It is believe that the products from this project will be available in the market in the next five years. The initial outlay is N200,000 while outlay in year one is projected to be N120,000. Annual net cash flows in the next four years are estimated to be N50,000; N80,000; N120,000 and N150,000. The cost of capital for the company is 15%.

Determine the viability of the project using IRR.

Since the NPV is negative, a lower rate of returns should be applied to generate positive NPV.

10. USING RATE OF RETURN OF 14%

Estimation of NPV of 1% rate of return is as follows:

$$\frac{\text{Difference in NPV}}{\text{Difference in CoC}} = \frac{(9{,}561) - (845)}{15 - 14}$$
$$= \frac{(8{,}716)}{1}$$
$$= (8{,}716)$$

Ratio of NPV of 14% to NPV of 1%
= (859)/(8,716)
= 0.0986

+ IRR = 14 - 0.0986
= 13.9%

The decision will remain the same as when interpolation was used as the IRR are the same.

Table 8. Computation of NPV at 11% rate of return

Years	Cash flows	Discount factor @ 11%	Present values
0	(106,000)	1.0000	(106,000)
1	34,000	0.9009	30,631
2	50,000	0.8116	40,580
3	32,000	0.7312	23,398
4	24,000	0.6587	15,809
		NPV	**4,418**

Source: Author's Computation (2019)

Table 9. Computation of NPV at 13% rate of return

Years	Cash flows	Discount factor @ 13%	Present VALUES
0	(106,000)	1.0000	(106,000)
1	34,000	0.8850	30,090
2	50,000	0.7831	39,155
3	32,000	0.6931	22,179
4	24,000	0.6133	14,719
		NPV	**143**

Source: Author's Computation (2019)

Table 10. Computation of NPV at 15% rate of return

Years	Cash flows	Discount factor @ 15%	Present values
0	(200,000)	1.0000	(200,000)
1	(122,000)	0.8696	(106,091)
2	80,000	0.7561	60,488
3	100,000	0.6575	65,750
4	150,000	0.5718	85,770
5	170,000	0.4972	84,524
		NPV	**(9,559)**

Source: Author's Computation (2019)

Table 11. Computation of NPV at 14% rate of return

Years	Cash flows	Discount factor @ 14%	Present values
0	(200,000)	1.0000	(200,000)
1	(122,000)	0.8772	(107,081)
2	80,000	0.7695	61,560
3	100,000	0.6750	67,500
4	150,000	0.5921	88,815
5	170,000	0.5194	88,298
		NPV	**(845)**

Source: Author's Computation (2019)

The IRR can also be gotten using 15% as follows:

Ratio of NPV of 14% to NPV of 1%
= (9,561)/ (8,716)
= 1.0969

+ IRR = 15 – 1.0969
= 13,9%

11. DISCUSSION OF FINDINGS

It was discovered that IRR is a veritable tool for the evaluation of long term investments but made cumbersome to estimate thereby, losing its importance. IRR like interest rates is easily understood by non-finance managers and uneducated investors but the use of trial and error process makes it boring and cumbersome.

This study revealed that IRR generates NPV of zero when applied to evaluate a project thereby, justifying the assertion that it is a breakeven rate of return. This is in line with the finding in the study of Oki and Sivaruban [14]. The implication of this is that the IRR must not be lower than the minimum desirable rate of returns by investors in the firm.

It was discovered that most large firms apply IRR in their project evaluation in line with the findings of Graham and Harvey [12]. However, the use of trial and error makes the estimation complex. Small firm that cannot employ the services of experts and consultants lose the benefits of the use of IRR in their project estimation. Small firms need IRR more than the large firms because of the fact that it can easily be understood by the owners of these small firms since it is a rate like interest charge on funds borrowed.

It was revealed that IRR does not require the determination of cost of capital before its estimation unlike the NPV. This finding is in conformity with the assertion by Malomo [15]. This makes it easy for use by small firms that are not quoted on the Stock Exchange that might find cost of capital difficult to calculate. However, the prolong process of estimation through trial and error makes its estimation uninteresting to small firms.

It was revealed that IRR can help firms to determine where to source for funds as a comparison between IRR and interest rates can be used to determine the viability or otherwise of the project. In fact, where IRR is not higher than the interest rate, the project will incur a loss. This is in agreement with the assertion of Akinsulire [16]. This model will therefore ensure that IRR is made easy to

estimate so as to enjoy the benefits associated with its use.

12. CONCLUSION

The need to make the world an easy one should be the desire of every living being. The need to be sure of the viability of investment of any investor cannot be over emphasised. A wrong step taken at the beginning of any project will be carried for a long period of time. This makes the proper evaluation of projects very essential. One of the techniques for project evaluation is IRR which has become a challenge to students and investment analysts even when it is claimed to be widely used by large and growing companies [6]. Hence, the need for a simplifying method of estimation of the IRR of projects. This study provides a model for the estimation of IRR. Investment analysts must take time to estimate the IRR of projects so that investors can source for funds that will not jeopardise their investments. Any fund whose interest rate is higher than the IRR of the project will render the project unviable.

ACKNOWLEDGEMENT

The author appreciates management and students of Summit Accountancy Tutors more especially performance management class for their contributions towards making this model a reality. The assistance of Mr. Sola Victor Agbeye in proof reading the manuscript and the encouragement from Deaconess Veronica Agbeye is recognized in this work.

COMPETING INTERESTS

Author has declared that no competing interests exist.

REFERENCES

1. Ruchi J. Capital budgeting: An investment decision method; 2016.
   Available:www.slideshare.net
2. Konstatin P, Konstatin M. Investment appraisal methods. Power and Energy Systems Engineering Economics. 2018;39-64.
3. Block SB, Hirt GA. Foundations of financial management. 9th Edition. McGraw-Hill Higher Education, USA. 2000;344-352.
4. Chandra P. Financial management: Theory and practice. 5th Edition, Tata McGraw-Hill Publishing Company Ltd, New Delhi. 2001;201-214.
5. Chartered Professional Accountants-Canada; 2017.
   Available:https//www.cpacanada.ca/en/career-and-professional-development/webinars/care-areas/management-accounting/planning-budgeting-and-forecasting/capital-budgeting-effectively-analysing-business-decisions
6. Daunfeldt S, Hartwig F. What determines the use of capital budgeting methods? Evidence from Swedish listed companies. Journal of Finance and Economics. 2014;2(4):101-112.
7. Alkaraan I, Hopper T. Capital budgeting: Theory and practice; 2005.
   (Retrieved on 22/11/2019)
   Available:www.researchgate.net
8. Pike RH. A review of recent trends in formal capital budgeting process. Accounting and Business Research. 1983;13(51):201–208.
9. Al-Mutairi A, Naser K, Saeid MH. Capital budgeting practices by non-financial companies listed on Kuwait Stock Exchange (KSE). Cogent Economics & Finance. 2018;6(1).
   DOI: 10.1080/23322039.2018.1468232
10. Institute of Chartered Accountants of Nigeria. Strategic financial management. Emile Woolf International, Berkshire, United Kingdom. 2014;101–127.
11. Maroyi V, Van der Poll HM. A survey of capital budgeting techniques used by listed mining companies in South Africa. 2012;6(32):9279–9292.
12. Graham JR, Harvey CR. The theory and practice of corporate finance: Evidence from the field. Journal of Financial Economics. 2001;60(2-3):187-243.
13. Gupta D. Capital budgeting decisions and the firm's size. International Journal of Economic Behavior and Organization. 2016;4(6):45-52.
   DOI: 10.11648/j.ijebo.20160406.11
14. Oki F, Sivaruban S. Capital budgeting and cost evaluation techniques: A conceptual analysis. International Journal of Science and Research. 2016;1553–1557.
15. Malomo M. Management accounting with application of quantitative techniques. Chinedum Publishers Ltd, Lagos, Nigeria. 1999;371.
16. Akinsulire O. Financial management. 4th Edition. Ceemol Nigeria Ltd, Lagos, Nigeria. 2006;78.

17. Pandey IM. Financial management. 9th Edition, Publishing House PVT Ltd, New Delhi. 2005;145.

18. Drury C. Management and cost accounting. 8th Edition, Chagman and Hall, London, UK. 2012;307–309.

Peer-review history:
The peer review history for this paper can be accessed here:
http://www.sdiarticle4.com/review-history/53056