



## **THE ROLE OF INVESTMENT APPRAISAL/CAPITAL BUDGETTING TECHNIQUES IN EVALUATING THE PROFITABILITY OF PROJECTS: A REVIEW OF LITERATURE**

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### **ABSTRACT**

Capital budgeting is a step by step process that businesses use to determine the merits of an investment project. It provides techniques which play key role for choosing worth funding projects. Any business that seeks to invest its resources in a project, without understanding the risks and returns involved, would be held as irresponsible by its owners or shareholders. Furthermore, if a business has no way of measuring the effectiveness of its investment decisions, chances are that the business will have little chance of surviving in the competitive marketplace. The aim of this paper is to examine the role of investment appraisal or capital budgeting techniques in determining the profitability of proposed projects. The paper relies heavily on journal articles, textbooks and other relevant materials for reviews and findings. Based on the extant literature, it was found out that the capital budgeting techniques commonly used in evaluating the profitability of projects are- pay-back period, accounting rate of return, net present value, internal rate of return, and profitability index. It was also found out that most companies, especially the small manufacturing firms do not make use of sophisticated investment appraisal techniques. They largely rely on the non-discounting techniques, which ignores the time value of money. Large firms are more inclined towards using sophisticated techniques rather than their small counterparts. This research adds to the body of knowledge on capital budgeting in general. It is expected to assist management in choosing the best capital budgeting technique in the evaluation of its future investment projects. Finally, useful suggestions and recommendations

were provided on how companies can improve their decisions on investment and thus their level of profitability.

**Keywords:** Investment, Investment Appraisal, Appraisal Techniques, Discounted/Non-discounted Techniques, Profitability

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## **INTRODUCTION**

Investment can be described as any business activity or decision which involves the commitment of resources with the goal of maximizing the value of the resources committed within a specified period. Therefore, knowing this ultimate goal of investment, most business organisations commit huge sum of resources in cash, time and human resource to ensure that good investments are identified and implemented or undertaken to maximize shareholders' wealth and the firm's value (Ndanyenbah & Zakaria, 2019). Profitability plays an important function in business operations and is a key measure that determines business continuity or closure (Ugwuoke, 2008; Farah & Altinkaya, 2018). Because investment decisions rank among the most critical types of managerial decisions made in a firm and can have major long-term implications, both positive and negative, for the success of a firm, managers must understand how investment decisions are made if they are to participate in improving corporate performance (Obi & Adeyemo, 2014).

Investment appraisal or capital budgeting techniques are methods used by companies to authorize capital spending on long-term projects. By using these tools, uncertainty and risk are those factors that can be minimized. Capital budgeting plays a pivotal role in any organisation's financial management strategy (Dabor & Modugu, 2013). It plays an important role in allocating resources. The realization that a business leverages its competitive advantage on its resources and on how it undertakes decisions relating to the use of its resources, such as financial resources call for managers to make informed decisions. Capital budgeting decisions thus have a long-range impact on the strategic performance of an organization and are also critical to its success or failure. Ideally, businesses should pursue all projects and opportunities that enhance shareholder value. Generally, businesses prefer to intricately study a project before taking it on, as it has a

great impact on the organization's financial performance (Awomewe & Ogundele, 2008).

Issues related to capital budgeting and investments are the subject of many studies, primarily in the field of finance, accounting, economics and management. There is no doubt that the most important part of capital budgeting is the analysis and evaluation of investment proposals and deciding which projects to undertake (Pawlak, Rapacewicz & Zarzecki, 2020). Several companies have lost their identity or liquidated due to wrong capital budgeting decision they made at one particular time or the other. It is therefore important to use effective methods to analyses investments before any decision is made (Mrongo, Iravo & Nyagechi, 2016). A firm that does not invest in long-term investment projects does not maximize stakeholder interests, especially shareholder wealth. A company grows when it invests in capital projects, such as plant and machinery, to generate future revenues that are worth more than the initial cost (Ross, 2011; Shapiro 2005; Pearce, 2019). Thus capital budgeting has a long-range impact on the firm's performance and it is crucial to the firm's success or failure.

Faced with limited sources of capital, management should carefully decide whether a particular project is economically acceptable. In the case of more than one project, management must identify the projects that will contribute most to profits and, consequently, to the value (or wealth) of the firm. This, in essence, is the basis of capital budgeting (Awomewe & Ogundele, 2008). Against this background, this research directed itself towards analyzing the role of capital budgetting in evaluating the profitability of projects.

## **LITERATURE REVIEW**

### **Investment Appraisal/Capital Budgetting**

Capital budgeting is a step by step process that businesses use to determine the merits of an investment project (Gowtham & Peter, 2017). Capital budgeting, also known as investment appraisal, is the process of making planning decisions and analysis of opportunities for long-term investments in assets to produce benefits for more than one year (Lunkes et al. 2015). Capital budgeting could also be defined as a process in

which a business determines whether projects such as building a new plant or investing in a long-term venture are worth pursuing (Awomewe & Ogundele, 2008).

Capital budgeting is a major terrain in the sphere of financial management. It is defined as a set of procedures, routines, methods and techniques used for making decisions on how to allocate resources among investment projects so that corporate profitability and the financial growth of a firm is ensured (Segelod, 1998; Al-Mutairi, Naser, & Saeid, 2018; Kengatharan & Nurullah, 2018). The continuous poor performances of firms in a dynamic business environment suggest that financial managers must choose investments with satisfactory cash flows and rate of return. Financial managers should be able to decide if an investment is worth undertaking and should also have the ability to choose intelligently given other alternatives (Balarabe, 2020).

### **Techniques of Investment Appraisal**

Basically, capital budgeting techniques is divided into two categories: discounted cash flow and non-discounted cash flow techniques. Non-discounted cash flow is the method in which time value of money is not considered. The Payback Period (PBP) and the Accounting Rate of Return (ARR) are the two main types of non-discounted methods. Discounted cash flow is the vice versa of the non DCF (Ishtiaq et al. 2017). The DCF techniques also include the Net Present Value method (NPV), the Internal Rate of Return method (IRR), and Profitability Index (PI). The logic behind DCF analysis is to forecast relevant future cash flows and take the issue of time into account by discounting the cash flows back to present value. The process is performed by the help of a discount rate, representing opportunity costs and risk. The aim is to find expected present value of future income and costs, and to compare this value with projects' investment costs (Gowtham & Peter, 2017).

#### **1. Payback Period (PBP)**

The payback period method tells the duration it is expected to take to recover the principal investment from the net cash flows of an investment or project. Payback period is said to emphasize the management's concern with liquidity and the need to minimize risk through a rapid recovery of the initial investment. The use of the payback method as the only or the major method

seems to be more commonly used in small and medium-sized companies. The major deficiencies of the payback method are that it ignores cash flows after the payback period and that it does not measure the time value of money in correct manner. This method is commonly used in pure profit evaluations as a single criterion and also sometimes used when focusing on aspects such as liquidity and project time risk. The obvious cases of profitable and unprofitable investments are sorted out, when the payback method is used as the first screening device, leaving only the investments that have survived the screening process in the middle group to be scrutinized by means of more advanced and more time consuming calculation methods based on discounted cash flows (DCF), such as the Internal Rate of Return (IRR) and Net Present Value (NPV) methods. However, it should be noted that there are many companies of considerable size, where the payback period is used as the single criterion in investment evaluations (Blatt 1979; Awomewe & Ogundele, 2008).

## **2. Accounting Rate of Return (ARR)**

Also known as the average rate of return, it bases project evaluation on average income rather than the projects cash flows. Unlike the payback period, this technique produces a percentage rate of return figure which is then used to rank the alternative investments (Kitili & Nganda, 2014). The main advantages of this method are its simplicity of understanding and usage, given that the figures used in calculations are those provided by accounting reports. However, this method presents some important weaknesses. First, it does not take into account the time value of money. There is no objective way of determining the minimum acceptable rate of return. (Akalu, 2001; Afonso & Cunha, 2009).

## **3. Net Present Value (NPV)**

Net Present Value (NPV) is the present value of the cash flows at the required rate of return of your project compared to your initial investment. For instance, in computing the projects net present value, the cash flows occurring at different points in time are adjusted for the time value of money using a discount rate that is the minimum rate of return required for the project to be acceptable. Projects with positive net present values (or values at least equal to

zero) are acceptable and projects with negative net present values are unacceptable. In case the project is rejected, it is rejected because cash flows will also be negative. The NPV compares the value of the dollar today to the value of that same dollar in the future taking inflation and returns into account (Awomewe & Ogundele, 2008).

The advantages of the net present value method is that it is consistent with the theory of wealth maximization, it considers the time value of money, and also makes use of all the project cash flows throughout the duration of the projects life (John & Nwokoye, 2015). The disadvantages are that it requires estimates of cash flows which is cumbersome to calculate. The biggest disadvantage to the NPV method is that it requires some guesswork about the firms cost of capital. Assuming a cost of capital that is too low will result in making suboptimal investments, and assuming a cost of capital that is too high will result in forgoing too many good investments.

#### **4. Internal Rate of Return (IRR)**

The internal rate of return (IRR) is the discount rate often used in capital budgeting that makes the net present value of all cash flows from a certain project equal to zero. This in essence means that IRR is the rate of return that makes the sum of present value of future cash flows and the final market value of a project (or investment) equals its current market value. The internal rate of return provides a simple hurdle, whereby any project should be avoided if the cost of capital exceeds this rate.

According to Maher et.al, (1997), McWatters et.al. (2001), Umair (2015), the internal rate of return is that discounted rate at which the presented value of projected future cash flows calculated for each project, equal to present value of initial investment and it causes the net present value equal to zero. IRR and NPV are best but conflicting results arise when we do ranking of mutually exclusive projects. When time and cash flows of projects differ with one another then conflicts arises. If IRR is less than the required rate of return then project must be rejected because it will give the negative NPV (Umair, 2015).

## **5. Profitability Index (PI)**

Profitability Index (PI) is the ratio of the present value of future cash benefits at the required rate of return to the initial cash outlay, and thus referred to as “Benefits-Cost Ratio” Project is considered to accept if Profitability index is greater and equal to 1 (Umair, 2015). The advantages of PI is that it recognizes time value of money, and it is also consistent with wealth maximization principle. The disadvantages are that it requires estimates of cash flows which is cumbersome to calculate. At times, it fails to indicate the correct choice between mutually exclusive projects (Saleh, 2005).

### **Importance of Capital Budgeting**

Capital budgeting plays an important role in allocating resources in enterprises (Dabor & Modugu, 2013). Through a well-structured process of capital budgeting done by individual divisions, an enterprise can compare the profitability of its divisions, assess the feasibility of new business proposals, decide which projects to expand, construct a corporate portfolio to maximize returns, such as return on asset (ROA), return on equity (ROE) and risk adjusted return of capital (RAROC), and minimize risk (Wong, 2009; Dabor & Modugu, 2013). Capital budgeting decisions are among the most important decisions to be made by organizations, essential to their survival and success in the long term, besides being one of the most difficult decisions to be made by managers (Carmona et al., 2011; Lunkes et al., 2015). The reason is that, firstly, capital expenditures typically require large amount of resources. Secondly, the companies must determine the best way to obtain and return such resources. Thirdly, most of the capital budgeting decisions demand long term commitments, and finally, the time of decision is crucial (Lunkes et al., 2015). Capital budgeting is extremely important because the decision made involve the direction and opportunity for future growth of the organisation (Awomewe & Ogundele, 2008).

Capital budgeting decision is an important decision for the firms’ survival as profitability centers on capital expenditures, especially the major ones. Firms exist to earn profit except for non-profit organizations. Profitable capital investment leads to the growth and prosperity of an economy. If profitability is low, investment will

shrink. The investor needs tools to predict the profitability of proposed investments. Therefore, capital budgeting is very important for any firm as it impacts the growth and prosperity of the firm in the long term. It creates accountability and measurability (Balarabe, 2020).

### **Review of Empirical Studies**

Findings from the study of Otekunrin et al. (2018) on Investment Decision and Profitability in Brewery Industry (A Case Study of Nigeria Brewery Plc.) revealed that various types of investment decisions are open to a company and that investment projects are carried out based on the cost and the funds available to the company. Also, there are various techniques for measuring the payoffs from these projects. Similarly, Imegi & Nwokoye (2015) studied The Effectiveness of Capital Budgeting Techniques in Evaluating Projects' Profitability in Rivers State and was able to find out that the various capital budgeting techniques used in evaluating the profitability of a project are pay-back, accounting rate of return, net present value, internal rate of returns, profitability index, and net terminal value. It also found out that the most effective capital budgeting technique for evaluating the profitability of risk-free projects is the net present value.

Obi & Adeyemo (2014) in their study on Evaluation of Capital Budgeting and Investment Decisions in Nigeria disclosed that though the sampled firms understand the obvious advantages of the net present value and the other sophisticated investment appraisal techniques over the payback method, they still adopt the later because of the nature of their economic environment, their size, lack of sufficiently qualified personnel, paucity of funds and their weak organizational structure. Another study by Pawlak, Rapacewicz & Zarzecki (2020) on Investment Appraisal Practice in the Biggest Companies in Poland confirmed the popularity of NPV application in the largest public companies in Poland, as all surveyed entities use this method. It is also no surprise that as many as 93.3% of the surveyed companies use IRR. What is surprising, however, is the frequency of using the payback period commonly criticized in the theory as a project evaluation criterion. This method is used by 80.0% of the largest public companies.



A study by Balarabe (2020) on Capital Budgeting Decision and its Implication to Firm's Growth in Nigeria 2018 being the year free from recession revealed that acquisition of fixed asset, investment and outsourcing long-term debt has positive and insignificant relationship with return on asset of the sampled firms. Therefore, the study concluded that capital budgeting decision has no any impact on firms' growth in Nigeria.

Pearce (2019) investigated The Impact of Capital Budget Decision on Financial Performance of Commercial Banks in Sierra Leone and was able to find out that the implementation of the payback period technique in capital budgeting decision is highly correlated with commercial banks performance followed by three other techniques except for the internal rate of return technique that was negative and insignificant in both the correlation and regression results.

From the study conducted by Ndanyenbah & Zakaria (2019) on the Application of Investment Appraisal Techniques (IAT) by Small and Medium Enterprises (SMEs) Operators in the Tamale Metropolis Ghana, it was revealed that SME operators in the Tamale Metropolis had significant knowledge in the various basic IATs. There was also a significant application level of the IATs by the SME operators. Although the SME operators demonstrated significant knowledge and application level in the various IATs, it was discovered that they did not use the theoretical mathematical formulae of the IATs in appraising their investments. It was also discovered that operator's knowledge in an IAT had insignificant influence on its' application by the operator. The choice of the IATs by the SME operators was found to be significantly influenced by the SME Operator's gender, educational level and risk behaviour and the investment size and the business or industry type.

Kengatharan & Nurullah (2018) examined Capital Investment Appraisal Practices in the Emerging Market Economy of Sri Lanka. From the study, it was deduced that the most popular capital investment appraisal techniques used in Sri Lanka encompass Net Present Value (NPV), followed by Internal Rate of Return (IRR), Payback (PB), Accounting Rate of Return (ARR) and Discounted Payback (DPB). As for the capital investment appraisal tools incorporating risks, Sri Lankan firms prefer uncertainty absorption in cash flows, followed by sensitivity analysis, probability analysis, scenario analysis, and adjusting the required returns.

Farah & Altinkaya (2018) studied Capital Budgeting Decisions and Profitability in Manufacturing Firms in Uganda and the findings also revealed that there is significant and positive correlation between five dimensions of capital budgeting decisions and profitability of the organizations. The findings set up that there was relationship between the independent variables of capital budgeting decisions and profitability and were positive relationships between capital budgeting and profitability of the firms under the study.

Awomewe & Ogundele (2008) studied The Importance of the Payback Method in Capital Budgeting Decision and from their findings, it became evident that the payback method is still often used in organizations all over the world despite its criticism by the academicians, making inference from the analysis of companies in Europe, America and Africa. The importance of the payback method, which includes but not limited to its simplicity, liquidity and risk assessment have made the method to be gaining more awareness in appraising investment opportunity by practicing manager.

Olawale, Olumuyiwa & George (2010) assessed the Impact of Investment Appraisal Techniques on the Profitability of Small Manufacturing Firms in the Nelson Mandela Bay Metropolitan Area, South Africa. The results from the study indicated that small firms mostly do not make use of sophisticated investment appraisal techniques. In addition, the results indicated that the use of investment appraisal techniques has a positive impact on profitability.

## **Theoretical Background**

For the purpose of this study, the researcher considered Tobin's 'Q' theory of investment and real options theory

### **1. Tobin's Q Theory of Investment**

Q theory, also known as Tobin's Q theory, relates to the rate of investment as a function of Q, where Q is the ratio of the market value of new additional investment goods to their replacement cost (Tobin, 1969). Tobin argued that investments by the firms depend on whether 'q' is greater or less than one. When q-ratio is greater than one, it implies that the stock market places a higher value on firms installed capital than its replacement cost. This provides

incentive to the firms to add to its installed capital stock. However, if 'q' is smaller than one, the company should sell its assets rather than attempting to put them to use.

In practice, companies usually delay their expansion or contraction plans for some time- people do not respond as soon as they see  $q > 1$  or  $q < 1$ , and tend to wait until q remains considerably below or above unity (one).

## **2. Real Options Theory**

Real options theory is a modern theory on how to make decisions regarding investments when the future is uncertain. It is based on logical financial options in capital investments in the sense that they create a certain level of valuable flexibility. Real options theory is a major framework in the theory of investment decision-making which modifies the NPV theory. It assumes that companies have some choice regarding when to invest- their proposed project is similar to an option; there is an opportunity, which is not an obligation, to approve it and go ahead.

## **METHODOLOGY**

The methodology focus on the approach used in carrying out the study in order to achieve the objectives of the study. This is a conceptual paper which relies heavily on journal articles, textbooks and other relevant materials for reviews and findings. A conceptual paper synthesizes knowledge from previous work on a particular topic, and presents it in a new context to provide a springboard for new research that will fill knowledge gaps.

## **FINDINGS**

The present study sought to unearth the role of capital budgeting in evaluating the profitability of projects. Results indicate that the use of investment appraisal techniques has a positive impact on profitability. There are a number of ways to evaluate and invest an underlying project and selecting the methods to assess capital budgets depends on various factors. In general, the application of the techniques is determined by the manager's individual preferences and the environment in which

decisions are made. It is also indicated that small firms mostly do not make use of sophisticated investment appraisal techniques. They largely rely on the non-discounting technique, which ignores the time value of money. Small firms are less ready to use sophisticated capital budgeting techniques due to less access to human capital, which causes sophisticated methods to be more difficult. The application of sophisticated budgeting is more complex and entails a substantial cost, time and effort. Large firms are more inclined towards using sophisticated budgeting practices rather than their small counterparts. Although the use of non-discounting technique as the primary method for projects evaluation by large firms has decreased in the past years, it is still used as an important complementary tool.

## **CONCLUSION**

In regard to the literature review, findings and discussions, the study concluded that the use of investment appraisal techniques has a positive impact on profitability. Therefore, sensible investment decisions are vital to the profitability and financial performance of firms. The research contributes to existing literature by exploring the relationship between capital budgeting decisions and projects profitability.

## **RECOMMENDATIONS**

In view of the research findings, the following recommendations are made:

1. There should be adequate deliberation when making investment decision to ensure that objective and realistic decisions are taken since the future performance of the firm is largely dependent upon it. Companies should also ensure that investment decision on capital projects are reviewed from time to time to avoid over or under investment, in order to make maximum use of the scarce resources of the organization.
2. It is important for the owners of small firms to get involved in training and skill development. Low levels of financial literacy can impact the degree to which entrepreneurs use sophisticated investment appraisal techniques.
3. Financial institutions, such as banks and lending institutions should require evidence of investment appraisal before any decision to give credit or financial

assistance is taken. This will help to minimize investment failures thereby reducing credit defaults to the banks or financial institutions. In addition, the provision of and access to, impartial and expert financial advice can help entrepreneurs. Accountants are in an excellent position to provide this advice. Government should consider subsidizing accountancy advice for small firms

4. Further studies could investigate if industry differences and the age of the firm could have a major impact on the use of investment appraisal techniques.

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