

# APPRAISAL OF CAPITAL BUDGETING TECHNIQUES AND PERFORMANCE OF MANUFACTURING FIRMS IN NIGERIA

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## ABSTRACT

*Capital budgeting decisions is one of the most tasking managerial decisions taken in manufacturing firms and has been a very topical issue in the sustenance of existing firms and emerging firms in the world. This study basically appraised how capital budgeting techniques have affected the performance of manufacturing firms in Nigeria. The study adopted the cross-sectional design using a mixture of primary and secondary data. The research questions were collapsed into the questionnaire. On the whole, while a total of 76 questionnaires were administered, 72 were returned representing the entire population. The performance measures were analyzed for a seven year period (2011-2017). The study found that changes in the existing risk of a firm, utilizing good capital budgeting method and firm size will go a long way in positively affecting the specified performance measure. Also, capital intensity had a direct relationship with the specified performance measure of manufacturing industries in Nigeria. Following the findings, the study calls for the adoption from different quarters and suggests that they could affect performance positively.*

**Keywords:** Capital Budgeting Decisions, Internal Rate of Return, Net Present Value, Capital Intensity, Uncertainty, Manufacturing Firms

## INTRODUCTION

Widely circulated sentiment among researchers and specialists is that a company's future survival and achievement rely upon it getting its investment choices right (Brealey et al., 2010). Writings on investment of corporate finance practices have assisted in finding and investigating the gap between hypothesis and practice on this subject matter. Overall, these writings show that managers utilizes various techniques, some of which are hypothetically appropriate, while others are not so. The most prevalent assessment methods are the Internal Rate of Return (IRR), Payback (PB) and Net Present Value (NPV), alongside the use of sophisticated models; for example, simulation and real option (de Andrés et al., 2014). From these studies also, it has been suggested that certain characteristics of a firm such as size and educational background of managers may assist in explaining the decision of capital budgeting tools.

Corporate Performance is a measure of a firm's value generation. Generally, the economic sphere and the accounting sphere can be used to calculate performance measures of a firm. Estimating a firm's performance using the accounting sphere infers utilizing data based on the firm's financial statement. The economic sphere, on the other hand, includes estimations gotten from stock performance of a firm. In terms of measuring the performance of a firm using the aforementioned spheres, it is difficult to presume that one is superior to the other.

Justifications and reasons for applying measures from one of the two spheres can be found practically in previous studies (Alkaraan & Northcott, 2006).

Because capital budgeting decisions is one of the most tasking managerial decisions taken in manufacturing firms and has been a very topical issue in the sustenance of existing firms and emerging firms in the world, this study was carried out to appraise how capital budgeting techniques affect the performance of manufacturing firms in Nigeria. This paper is structured in the following ways: immediately after this introductory section is the literature review segment and hypothesis development. The third segment shows the collection of data and the econometric models used in the study. Hypothesis testing and results were shown and discussed in the fourth section. The study concludes with the summary of major findings and the limitations of the study.

## LITERATURE REVIEW

Literature on corporate investment practice has revealed internal rate of return (IRR) and payback (PB) as the most favored budgeting instruments of managers in many organizations (Payne et al., 1999; Graham & Harvey, 2001). These studies showed that internal rate of returns and paybacks are the most well-known instruments used by U.S managers of organizations during the 20<sup>th</sup> century. Such inclination however appear to have been inverted in certain countries because at present, the net present value (NPV) has become the most broadly utilized strategy in the UK (Alkaraan & Northcott, 2006), Canada (Bennouna et al., 2010; Baker et al., 2011a) and Australia (Truong et al., 2008). This notwithstanding, in other European nations and Asia, such as the case in Sweden (Holmen & Pramborg, 2009), Germany (Brounen et al., 2004; Sridharan & Schuele, 2008), Spain (Iturralde & Maseda, 2004), China (Hermes et al., 2007), Japan (Shinoda, 2010) and Singapore (Kester et al., 1999; Leon et al., 2008), pervasiveness of IRR and especially PB keeps on expanding. This literature seeks to clarify the gap between what is hypothetically right and what is really favored, practically speaking. Most clarifications are related to manager's inclinations and constraints. For instance, the solid inclination for IRR is clarified by the way that the data provided "fits" better with managers' psychological process (Evans & Forbes, 1993). Burns & Walker (1997) and Cohen & Yagil (2007) propose that IRR is picked on the grounds that managers are increasingly comfortable with percent values, which encourages projects comparison.

Empirical studies have shown that a company's capital budgeting practices depend upon its industry (Block, 2005; Rayo et al., 2007), size (Brounen et al., 2004; Danielson & Scott, 2006; Sridharan & Schuele, 2008), uncertainty sources (Verbeeten, 2006) or the economic development of the home nation (Hermes et al., 2007). Alongside these firm qualities, managers' profile is likewise found to impact capital budgeting. Age (Graham and Harvey, 2001; Hermes *et al.*, 2007), education (Graham and Harvey, 2001; Brounen et al., 2004) and inclusion in the basic decision-making process (Rayo et al., 2007) are three of the factors which demonstrate the best illustrative power.

Agboh (2011) examined the extent to which capital budgeting is being utilized as a tool for optimum investment analysis in manufacturing companies in Enugu and Anambra States. Survey research design was adopted for the study. Five hundred and fifty two (552) management staff of the 138 registered manufacturing companies operating in Enugu and Anambra States constituted the population of the study. Stratified random sampling technique was used to select a total of 336 management staff of 84 manufacturing companies which therefore constituted the

sample. The structured questionnaire with a rating scale of 5-point was proven valid by five professionals; two from the Vocational Teacher Education Department, University of Nigeria, Nsukka; two from the Department of Accounting, University of Nigeria, Enugu Campus and one professional Accountant from Bursary Department of the University of Nigeria, Nsukka. Their suggestions were incorporated to improve the final draft of the instrument used for the study. The study concluded that manufacturing companies utilized non discounted investment evaluation techniques to a great extent for investment decisions. A study conducted by Hayajneh & Yassine (2011) investigated the variables that affect working capital necessity in the banking industry. The study revealed that by and large, working capital prerequisite is directly connected with working cycle, return on assets, Tobin's (Q proportion) and industry however contrarily corresponded with firm size.

## Hypotheses Development

The following four hypotheses were developed to guide this study:

*H<sub>01</sub>: There exists no significant relationship between the use of non-discounted capital budgeting techniques return adopted by manufacturing industries and the enhancement of the performance of manufacturing companies in Nigeria.*

*H<sub>02</sub>: There exists no significant relationship between the adoption of net present value (NPV) method of investment appraisal and the enhancement of the performance of manufacturing companies in Nigeria*

*H<sub>03</sub>: There exists no significant relationship between the use of internal rate of return (IRR) and the enhancement of the performance of manufacturing companies in Nigeria.*

*H<sub>04</sub>: There exists no significant relationship between the characteristics of capital budgeting of project and the performance of manufacturing companies in Nigeria.*

## MATERIALS AND METHODS

### Questionnaire Survey

The data analyzed were obtained through responses to questionnaires which were administered on some randomly selected manufacturing companies quoted on the Stock Exchange, such as; Nigerian Bags Manufacturing Company; paper/forest products; paints and coatings manufacturers; Ashaka Cement Plc, Dangote cement Plc; First Aluminum Nigeria Plc; Flour Mills Nig. Plc; Nigeria bottling Co Plc; Dangote Sugar refinery Plc; Dangote flour mills Plc; 7-up bottling company Plc etc. The questionnaire elicited information from the companies on:

- a) The techniques adopted for project evaluation in their companies;
- b) The extent to which the same capital budgeting techniques are used in evaluating investment opportunities; and
- c) The effects of risks, uncertainties and estimates of projects/investments on corporate performance of manufacturing industries.

In order to get a fair representation companies were selected from those quoted on the Stock Exchange. Companies on the Stock Exchange were used because of easy access to their

financial statements. All copies of the questionnaire were posted and directed to the finance division of each of the companies for filling/answering of the questions and personal interviews were also made to ensure the cooperation of the respondents. By adopting this procedure, a high response rate was anticipated. Seventy-two (72) out of the 76 administered questionnaires were received, giving a responses rate of 95% with four selected manufacturing companies considered. Also used as secondary data were Financial Statements of the selected companies for ten years. Information extracted from these financial statements were; (i) Operating assets which are defined as Gross Fixed Assets plus current assets was used because of differences in depreciation policies of their companies and their effects on the book values of assets; and (ii) Operating income which is defined as earnings before interest and taxes plus depreciation and non-recurring items. Again the definition is used for the following reasons: depreciation policies vary; both interest paid and taxes are part of a firm's return and their exclusion will distort the time performance; the inclusion or exclusion (as the case may be) of non-recurring items would distort the performance of company; and this was also done in order to place income on the same basis as assets.

### Research Design

Since testing the hypotheses developed has to be confirmed through respondents' responses, the survey was intended to accommodate all the pertinent questions that will either demonstrate or expose the hypotheses. Some of the questions are close-ended in structure while others are open ended and scaled.

The responses were entered using Likert five point scales, which ranges from "Strongly agree to strongly disagree". Below are the points awarded to each response:

Strongly disagree	-	1 point
Disagrees	-	2 points
Undecided	-	3 points
Agree	-	4 points
Strongly agree	-	5 points

### Study population

This study covered the corporate practices and performance of manufacturing sector of the Nigeria economy. The entire population for the purpose of this study consisted of all manufacturing companies quoted on the Nigeria Stock Exchange between year 2011 and 2017.

### Tools for data analysis

The questionnaire was aimed at obtaining the demographic data of the respondents such as their gender, marital status, educational qualification, ages to better characterize the sample. It also served as a major instrument for obtaining answer to the research questions and hypotheses.

In order to provide for the rejection or acceptance of the hypotheses posited, the data collected was tested by the use of the Chi-square ( $X^2$ ) Statistical Techniques. The Chi-Square is a more suitable test for determining how well an observed set of data fits an expected set.

### Reliability testing

In evaluating the reliability of the instruments used in this study, the test re-test strategy was utilized and it involved administering similar test twice to a similar group of respondents chosen for the study. Since individual items can't have a Cronbach's alpha internal consistency dependability, the reliability coefficient of the test-retest was determined based on individual item. For the instruments to be dependable, the Cronbach's alpha estimation of 0.7 on the pretest instrument was attained before use.

## RESULTS AND DISCUSSION

### Demographic Survey

A total of 76 questionnaires were administered, 72 were returned representing a response rate of 95% while 4 representing 5% were not returned. While none of the respondent was under 18 years of age, 30 (41.7%) of the total respondents are between the ages of 18 to 30 years. Furthermore, 20 (27.8%) and 22 (30.5%) of the total respondents, fell within 31 to 40 years of age and above 40 years of age respectively. The gender analysis showed that 38 (52.8%) of the total respondents were male while 34 (47.2%) of the respondents were Female. While 22 (30.5%) of the total respondents were single, 48 (66.7%) and 2 (2.8%) of the total respondents were married and divorced respectively. The respondents were all found to have been educated above the secondary school level.

Similarly, 28 (39%) of the total respondents had polytechnic or its equivalent educational background, thirty-six 36 (50%) and 8 (11%) of the total respondents had university degree or its equivalent and other qualifications respectively.

### Effect of Non-Discounted Capital Budgeting Techniques Corporate Performance

Result from the study showed that 22 (30.56%) of the total respondents strongly agreed with the notion that "Non-discounted capital budgeting techniques, such as payback period, accounting rate of return adopted by manufacturing industries, has a negative statistical influence on their corporate performance". While 25 (34.72%) of the total respondent agreed, it was also discovered that 10 (13.89%) and 8 (11.11%) of the respondents disagreed and strongly disagreed respectively with the same notion. Seven 7 (9.72%) were found to be undecided on the issue.

The cumulative of those that strongly agreed and agreed with the notion is 47 (66.28%) of the total respondents implying that "non-discounting method of capital budgeting techniques, adopted by manufacturing industries, has negative statistical influence on their cooperate performance". Majority of the respondents agreed that manufacturing companies prefer to use payback method when they evaluate investment opportunities, despite its criticism. Table 1, shows that 9 (12.5%) and 4 (5.56%) of the total respondents agreed and strongly agreed respectively with the notion that "Net present value (NPV) method of investment or in investment decision making of projects of manufacturing companies" On the other hand, 40 (55.6%) and 18 (25%) of the total respondents disagreed and strongly disagreed respectively with same notion and 1(1.39%) of the respondents were undecided on the same issue.

At  $P > 0.05$ , using the Chi-square value statistical tool, the null hypothesis was rejected and the alternative hypothesis "the utilization of non-discounted capital budgeting tools, such as

Pay-back period, accounting rate of return adopted by manufacturing industries has significant influence on corporate performance” accepted. This result is in line with the findings of (Siyanbola, 2013; Mohammed & Ali, 2013; Pimpong & Laryea, 2016) in their research but it is in contrast to the findings of Tromp (2009) where he pointed out that, there is little or no relationship between capital budgeting and firms’ performance. Also, at  $P > 0.05$ , the null hypothesis was rejected and the alternative hypothesis that “the use of Net present value (NPV) method of investment appraisal enhances corporate performance” was accepted. This result is similar to the findings of Imegi & Nwokoye (2015).

Question	Label/rating	Frequency	Percentage (%)
Do you think Net present value (NPV) method of investment appraisal needs support in evaluating investments or in investment decision making of projects?	Strongly Agree (5)	4	5056
	Agree (4)	9	1205
	Undecided (3)	1	1.39
	Strongly Disagree (2)	18	25.00
	Disagree (1)	40	55.56
Total		72	100

### **Internal Rate of Return (IRR) Method of Investment**

Generally, the respondents disagreed that NPV methods needed support of other methods of investment appraisals in decision making. Result obtained in this study showed that 20 (27.78%) and 34 (47.22%) of the total respondents agreed and strongly agreed respectively with the notion that “internal rate of return (IRR) method of investment has role in ranking mutually exclusive projects/investments of manufacturing industries”. On the other hand, 4 (5.56%) and 10 (15.89%) of the total respondents disagreed and strongly disagreed respectively with the same notion. However, 4 (5.55%) of the respondent were undecided on the same issue. The opinions of the respondents confirmed that there was an agreement that internal rate of return (IRR) method of investment analyzes has role in ranking mutually exclusive projects/investments of manufacturing industries.

Similarly, the null hypothesis at  $P > 0.05$ , was rejected and the alternative hypothesis that says “the use of internal rate of return (IRR) method of investment analysis in ranking mutually exclusive project enhances, corporate performance” was accepted. Also, the null hypothesis “The characteristics of capital budgeting of project/investments, such as; uncertainties, risk, size and capital intensity, influences corporate performance” at  $P > 0.05$ , was rejected, however, the alternative hypothesis was accepted. This result is also in line with the findings of Imegi & Nwokoye (2015).

### **Characteristics of Capital Budgeting of Projects/Investments**

The questionnaire survey further showed that 12 (16.67%) and 12 (11.11%) of the total respondents agreed and strongly agreed respectively with the notion that “the characteristics of capital budgeting of projects/investments, such as; uncertainty; risk; size and capital intensity; has no influence on the performance of a corporate organization visa-vise manufacturing industries.

On the other hand, 23 (31.94%) and 25 (34.72%) of the total respondents disagreed and strongly disagreed respectively with the notion and 4 (5.56%) of the respondents were undecided on the same issue. The characteristics of capital budgeting of projects/investments such as; uncertainty, risk, size and capital intensity were found to have no influence on the performance of a corporate organization visa-vis manufacturing industries. 20 (27.78%) and 34 (47.22%) of the total respondents agreed and strongly agreed respectively with the notion that “Is the same capital budgeting technique used in their companies for evaluating projects/investments for: Replacement; Expansion and projects for new products”. Similarly, 8 (11.11%) and 10 (13.89%) of the total respondents disagreed and strongly disagreed respectively with the same notion. However, none of the respondents was undecided on the issue.

### **Influence of Management View of Uncertainty/Risk in Capital Budgeting**

In the same vein, 12 (16.67%) and 10 (13.89%) of the respondents agreed and strongly agreed respectively with the notion “that management of their company, have uncertainties/risks handling measures or procedure of their investments within the period under consideration. Similarly, 18 (2.5%) and 24 (33.33%) of the total respondents disagreed and strongly disagreed respectively with the same notion. However, respondents who were undecided on the issue were 8 (11%). Table 2 indicates that respondents agreed that management of their company has uncertainties/risks handling measures or procedures of their investments within the period under consideration.

<b>Likert Scale</b>	<b>Rate</b>	<b>Response</b>	<b>fx</b>
Strongly Agree (5)	5	22	110
Agree (4)	4	25	100
Undecided (3)	3	7	21
Strongly Disagree (2)	2	8	16
Disagree (1)	1	10	10
Total		72	257
		Mean	3.57

Source: Author’s Computational Result (2018).

The questionnaire survey also showed that 20 (27.8%) and 25 (34.72%) of the total respondents agreed and strongly agreed respectively with the notion “there is involvement in the analysis of their organization corporate investments within the period”. Similarly, 8 (11.11%) and 14 (19.44%) of the total respondents disagreed and strongly disagreed respectively with the same notion, and respondents who were undecided in the same issue were 5 (6.94%). About 10 (13.89%) and 18 (25.05) of the total respondents agreed and strongly agreed respectively with the notion “that their company have a separate division and at last one staff assigned fulltime to capital budgeting”. On the other hand, 20 (27.77%) and 22 (30.56%) of the respondents disagreed and strongly disagreed with the notion and respondents who were undecided on the issue were 2 (2.78%).

## CONCLUSION

The study investigated the extent to which capital budgeting decision affects the performance of manufacturing industry in Nigeria. The study show that changes in the existing risk of a firm, firm size and the use of sophisticated capital budgeting method go a long way in positively affecting performance measures. It was also observed that capital intensity has direct relationship with the specified performance measure of manufacturing industries in Nigeria. Most firms in Nigeria were found to use non-sophisticated method irrespective of their size, risk and capital intensity, and changes do not appear to have occurred in capital budgeting methods to the extent of reflecting on the level of performance. The normal practice with regards to utilizing "Efficiency" markers, for example, payback (PB) and internal rate of return (IRR), to enhance the NPV technique was observed to be misplaced, given that such measures confound as opposed to enhance the choice procedure.

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