



COST-BENEFIT ANALYSIS IN BUDGETING PUBLIC FUND FOR CRITICAL INFRASTRUCTURE TRANSFORMATION IN DEVELOPING WORLD

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Abstract

The study examined the cost-benefit analysis in budgeting public fund for critical infrastructure transformation in the developing world. The study adopted descriptive survey research design. The population was chosen from the staff of ministry of finance, budget office and economic planning of Imo state, Nigeria. Structured questionnaire was administered to 50 (fifty) respondents selected through purposive and simple random sampling. The statistical package for social science (SPSS) 20.0 was used as method of data analysis, and multiple (ordinary least square) regression techniques to test the explanatory variables relationship with the dependent variable. The study conducted also descriptive statistics and correlation matrix. The analysis revealed that the various variables are negative, which means the government does not consider cost-benefit analysis in the budgeting of public fund for critical infrastructural transformation. There is poor policy formulation, inefficient deployment of budget resources, execution of allocated resources. The F-stat value of 23.454 is significant at 5% as $P < 0.05$ and confirms statistical significance of the model and that significant linear relationship exists between the independent and dependent variables. The study therefore, concluded that, there was absence utilization of cost-benefit analysis in the budget formulation process and budgeting of public fund for critical infrastructural transformation in the developing world. The researchers recommended that for proper provision of critical infrastructure in the developing world, cost-benefit analysis must be considered in budgeting public fund.

Keywords: Cost-Benefit Analysis, Budget, Public Fund, Infrastructure

Background of the Study

Provision of critical infrastructure in the sub Saharan Africa has been an issue of concern. Most sub-Saharan African countries critical infrastructures have remained

at the dilapidated and decayed level since after their independence. Various governments through annual incremental budget allocation of resources, pay lips service to these infrastructures, while some budgeted funds, as a result of poor planning, official corruption and other inadequacies that beset the countries, including absence of a sustained and deliberately deployed long term development strategy and the poor implementation of reforms has not yield any benefit. Critical infrastructures such as power and energy, information and communication technology, and good road network has hindered the desired economic development in these countries. Inability of the governments to provide these needed critical infrastructures is partly due to application of cost-benefit criterion in budgeting public funds and lack of new direction in transformation plans.

According to Mgbemena, Akamobi, Ogunnobi, Ibekilo and Ekesiobi (2015) a well-developed energy, transportation and communication infrastructure networks are a prerequisite for linking less developed communities to markets in a sustainable way. Onuegbu, Onwuka and Obiah (2015) added that these essential infrastructure that connect people as an ingredient for economic growth and sustainable development (Nwaneri, Obiah & Nwachukwu, 2016; Nwadioko, 2012). Priority has not been given to these infrastructures in the policy decision recent times in our budgets, particularly by this present change administration.

Nwaneri and Obiah (2016) observed that essence of budget is to address the needs of the society in a particular year to enhance economic development. In every economy, both developed and developing economies, economic planning is of great importance to both government and corporate entities. The emerging especially required an accurate planning and reliable data to develop their economies and hence give basic social amenities and better standard of living to their citizen (Okeke, 2001). Yet, economic policy decisions we often formulated and implemented without the benefit of being informed by relevant research (Eboh, 2014); but cost-benefit for these purposes are of high priority to all governments and have to be analyzed over a period if meaningful budget planning and implementation is to be achieved. Planning and control of costs and operations are the keys to good management which then result into profitability or effective service to the citizenry.

From N6.06 trillion signed into law on 6th May 2016 to N17,4 trillion of 2022, the Vice President Prof, Yemi Osinbanjo had stated that the budget will be a zero-based budgeting, a situation where more money will be allocated on a more prioritize areas (Nwaneri & Obiah, 2016). These, according to Bushir (2016) consist of resources prioritization, prioritization of programmes of the budgeting, Ezeobi (2011) stated, involves allocation of the resources of a government on the basis of the cost-benefit Analysis (CBA) to be conducted on each of its activities. It is a budget based on the goals and activities of the present year. Most the budgets are bereft of prioritization, lack of policy direction and lack content of infrastructural roadmap. This is an

indication of misplacement of priority that also makes the budget anti-future; so did insensitivity, duplicity, greed, inefficiency, lack of vision, anti-people tendencies (Oke, 2016).

What that is essential is the appropriation or allocation of public funds to the critical infrastructural facilities as a strategy that will build resilience in the economy, guarantee that the contemporary challenges did not confront the sub-Saharan Africa's future generations. One of the key things also is that the government should look at its socio-economic infrastructure (Umoru, Ovuakporie & Agbakwuru, 2016; Fabunmi, 2016). Placing priority and efficiency in the allocation of budget resources and effective implementation will be possible with cost-benefit criterion. The idea can only help to diversify the sub-Saharan Africa economy and boost production capacity in manufacturing sector, which will make us to go out from the mono-economy that they operate today.

Research Problem

The place of public choice, priority and alternatives may be important in the allocation of public funds in the budget system. The cost-benefit criterion is an effective measure in taking decision for the public choice. Policy plans and budget should be based on cost-benefit (CB) criterion. Therefore, prioritization intervention and established obtainable objectives with useful measurement of progress helps sub-Saharan Africa with limited resources make decisions about allocating their funds. The agenda-base had been ignored in the allocation of resources in the budget system, even as CB helps a decision maker to arrive at a good decision by helping to determine the alternative with the highest socio-economic benefit.

According to Ademolekun (1983) cited in Obiajulu and Obi (2004), in a CB study, the objective or goals of public expenditure are made explicit, alternative ways of achieving this objective are explored and the results of the analysis are available for all to inspect. The CB approach aims to provide the public decision makers with a selection procedure called the CB criterion. In spite of good reasons adduced for using CB, most critics blamed CB for damaging the political system. Some argue that politics is superior to analysis because of the wider scope of ideas and concepts the people practicing politics can fathom. Yet, some argue that analysis on franchise unelected policy analysts and disenfranchises those who do not understand, do not believe, or cannot use analysis to make their arguments to government (Nwaneri & Obiah, 2016). Such a situation, they further noted creates a loss of confidence in government institutions at the very least, and more fundamentally, subverts democratic government. To this group, as long as CB does not sacrifice political rationality on the altar of economic rationality, it is not a realistic tool for policy formulation and analysis. Citizens economic benefits are important in consideration of cost in budgetary system. As Dryzek (1993) points out, all that matters is how

much of the decision making process of budget formulation not as the deciding factor but as a technique to identify infrastructurally efficient policies, one of many quantitative and qualitative and quantitative factors in political decision making. Therefore, the question is how can CB helps to prioritize government public expenditure on budgeting infrastructures to achieve socio-economic utility? The budget resides on the infrastructure's effects cost saving, inventive new uses for the public good, and competition with cost reduction in competing forms of goods the public supported, the ultimate cost of such project, both as to cost of construction and maintenance, to public commercial interests involved, and the expense of others. It requires Ministries, Departments and Agencies (MDAs) to consider all significant costs and benefit even unquantifiable ones, as well as alternatives in the formulation and implementation of budgets.

With the huge sums of money budgeted every year for the provision of infrastructure in the sub-Saharan Africa, extant literature reveals that critical infrastructures such as road network, power supply, information and communication technology and other essential amenities are still inadequate in the countries. Most of the factors denoted for these are: poor policy formulation, absence of utilization of cost-benefit criterion in the budget process, efficient deployment of budget resources and execution of the allocated resources. The paper will qualitatively and quantitatively explore all these factors to suggest how best to guarantee budgeting of public funds for the transformation of critical infrastructure in the sub-Saharan Africa. Studies have shown that infrastructure can have a significant impact on output, income, employment, global trade and quality of life (Oyedele, 2012).

Research Objectives

The broad objective of the study is to investigate whether cost-benefit criterion are used in budgeting public funds for critical infrastructural transformation. The specific objectives are:

- Examine if there is poor policy formulation in the budgeting of public fund for critical infrastructural transformation.
- Determine if there is efficient deployment of budget resources in the budgeting of public fund for critical infrastructural transformation.
- Ascertain if there is a significance difference between the absence of utilization of cost- benefit criterion in the budget process and budgeting of public fund for critical infrastructural transformation.

Research Questions

- Can the poor policy formulation affect the budgeting of public fund for critical infrastructural transformation?

- How can there be efficient deployment of budgeted resources in the budgeting of public fund for critical infrastructural transformation?
- What is the difference between the absence of cost-benefit criterion and the budgeting of public fund for critical infrastructural transformation?

Statement of Hypotheses

1. **H₀**: There is no poor policy formulation in the budgeting of public fund for critical infrastructural transformation.
H₁: There poor policy formulation in the budgeting of public fund for critical infrastructural transformation.
2. **H₀**: There is no efficient deployment of budget resources in the budgeting of fund for critical infrastructural transformation.
H₁: There is efficient deployment of budget resources in the budgeting of fund for critical infrastructural transformation.
3. **H₀**: There is no significant difference between the absence of cost-benefit criterion and the budgeting of public fund for critical infrastructural transformation.
H₁: There is significant difference between the absence of cost-benefit criterion and the budget of public fund for critical infrastructural transformation.

Review of Related Literature

Conceptual Review

Cost-Benefit

Cost simply means the resources used in achieving a particular objective measured in money terms (Harper cited in Nweze, 2004). It is defined as a sacrifice forgone measured in standard monetary terms for a specific objective. Elsewhere, Nweze (2016) sees cost objective as the technical name for the purpose for which cost are incurred and measured, which must be carefully stated and clearly understood. According to Ekwe (2003), cost could be looked as an exchange price made to secure a given benefit or goods) services, it must be quantified in monetary terms. As a consequence, it involves a reduction of assets or incurrence of liabilities at the time the benefits are acquired Nwoha & Ekwe, 1999). Benefit is simply a performance given to raise funds for some cause. Therefore, cost-benefit (CB) refers to the collection and organization of data relevant to a government leader's decision to intervene when market fails, through public projects, programmes or regulatory regimes (Musgrave, 1969). It is also a form of evaluation research concerning either continuing or discontinuing a project, project strategy, a technique or an improvement or allocating resources among competing projects (GAO, 1991 as cited in Nwaneri & Obiah, 2016). Evaluation criteria include effectiveness of a project's

performance in light of specified objectives, efficiency in maximizing value of minimizing cost through technological, economic or productivity analysis, adequacy of the project in the degree to which the project eliminates a problem, appropriateness or worth of the project objectives, and project responsiveness to the needs and desires of users. However, CB idea represents or tradeoff between efficiency and equality in social and economic affairs.

Despite its straightforward, initiative nature, CB rests on difficult choices about what are costs and what are benefits. In comparing the costs, benefits, risks and timing of government action-policy consequences can inform decision by policy analysts on what should contain in the budget. Again, the net benefit analysis steers government decision makers in pursuing government action. Hence making good decisions demand that the decision maker should have a good understanding of consequences before choosing the best alternative that can effectively solve the sub-Saharan critical infrastructural problem as contained in the budget.

Budget

Budget is a form of tool for planning and controlling resources in an estimation of cost, revenue and expenses over a periodic basis. According to the Chartered Institute of Management Accountants (CIMA) as cited in Nweze (2004), budget is defined as a plan quantified in monetary terms, prepared and approved prior to a defined period of time, usually showing planned income to be generated and expenditure to be incurred during that period and the capital to be employed to attain a given objective. Budgets are based on predetermined objectives and represents what is most likely to happen after a careful consideration of the priorities and constraints of the government (Nzotta, 2004). In the CB criterion, the priority areas should be on critical infrastructure.

Infrastructure

Infrastructure refers to the basic physical systems or amenities of a nation that contribute to economic development by increasing productivity and enhance the quality of life, which includes transportation, communication, water, power system, among others. The services generated as a result of an adequate infrastructural base will translate to an increase in aggregate output (Nwaneri & Obiah, 2017). Similarly, Onyenmuru and Okwo (2017) posited that infrastructural development is highly associated with fund, much revenue is needed to plan, execute and maintain infrastructures and facilities. Thus, priority and maintaining infrastructure is one of the key government roles because of the positive externalities (Nwaneri & Obiah, 2017), and the availability is highly associated with development.

Various researchers have explained the importance of critical infrastructure in the development and sustainability of the region. Nwaneri and Obiah (2017) opined that

extensive and efficient infrastructure is critical for ensuring effective transformation and functioning of the economy, as it is an important factor in determining the location of economic activity and the kinds of activities or sectors that can develop within a region. For Onyenmuru and Okwo (2017), a region's infrastructure network, broadly speaking, is the very socio-economic climate created by the institutions that serve as conduits of trade and investment. Some of these institutions are public, some are private. In either case, their roles in the context of integration are transformative, helping to change resources into output or to enhance trade by removing barriers. Furthermore, they postulated that "the linkages between infrastructure and economic growth are multiple and complex. Not only does infrastructure affect production and consumption directly, it also creates many direct and indirect externalities. It also involves large flows of public expenditure, thereby creating additional employment" (P.147). Therefore, its networks significantly impact on economic growth and reduced income inequalities and poverty. In a dynamic scenario, infrastructure plays the key role as a sub-Saharan public good that moves factors of production within and across nations thereby helping the region attain higher transformative growth.

However, infrastructure can help solve problems: social, health and environment, development and economics. But it can be broadly divided into two: Hard and soft infrastructure (Oyedele, 2012). Hard refers to the large physical networks necessary for the functioning of modern industrial economies, such as road construction, building of bridges, hospitals, schools, houses, water reservoirs, etc. Whereas soft refers to all the institutions which are required to maintain the economic, health, cultural and social standards of a region, such as the financial system, the education system, the health system, the governance system and judiciary system, as well as security. In sub-Saharan Africa, most infrastructures are now in comatose and need repairs, rehabilitation or replacement. Hence the critical infrastructure can do the magic in reviving the region, facilitate diversification, economic growth and development.

Theoretical Framework

This work is underpinned by Theory of Improvement and Public Finance Management Theory.

Pareto Theory of Improvement

Due to budgetary allocation of resources to achieve prioritize area infrastructure, this paper will align itself to Pareto Theory of Improvement. In 1897, Italian economist and sociologist Vilfredo Pareto (1843-1923), in his 'Manuale d'economia Politica (1906), his most influential work developed his theory of pure economics and his analysis of power to give satisfaction. In his study of the patterns of wealth

and income, observed that the distribution of wealth was predictably unbalanced. He first discovered this pattern in 19th-century England and found it to be the same for every country and time period he studied. In the 1890s, Vilfredo Pareto studied income tax data from England, Ireland, several Italian cities, German states, and Peru. He laid foundation of modern welfare economics with his concept of so-called Pareto Optimum, stating that the optimum allocation of the resources of a society is not attained so long as it is possible to make at least one individual better off in his own estimation. Pareto attempted to prove that the distribution of incomes and wealth in society is not random and that a consistent pattern appears throughout history, in all parts of the world and in all societies. He further discusses about Pareto improvement and criterion.

The Pareto criterion guides selection of a policy. The criterion formalizes the definition of economic efficiency by favouring those projects or policies in which at least one person is better off and no person is worse off as a result. The Pareto criterion goes one step further than economic feasibility to allow for more equity. Equity guides policies and programmes that give to each according to his needs from each according to her abilities whereas efficiency advises that public projects should result in at least one person being better off and no one worse off. The problem with mathematical approaches to determine public infrastructure funding is the quantification of benefits, especially those that are intangible and immeasurable. In nations where the values of individualism and decentralized decision making reign, we assume that each person can judge a policy alone. The sum of those judgement becomes the public welfare. Measuring benefits and costs involves careful consideration. Real benefits and costs are those that have an absolute consequence for society as a whole. That is, on balance the benefit or cost to society was not one in which the cost to one group of individuals was offset by the benefit to another group of individuals. The benefit or cost was not merely redistributed – as a pecuniary benefit or cost would describe, but an absolute change in the wellbeing of society as a whole. The opportunity cost of any project is the benefit and cost of another project foregone to proceed with the present one. The true worth of any project, therefore, is the cost (and benefit) of the most obvious substitute. With CBA, certain rights such as due process of the law or broad public participation and discourse, cannot be conceived simply because they are processes valued for themselves rather than outcomes.

Therefore, if the infrastructural transformation is a Pareto improvement, then enlisting the cooperation of others should be relatively easy for the developing world, because nobody has a strong reason to object to the change. In a zero transactions cost world, there would be no reason for government to aid in the allocation of resources, because all potential Pareto improvements would be made through market exchange. Thus, political action to aid in the allocation of resources

maybe demanded when there are transaction costs, and government intervention has the potential for enhancing welfare by overcoming those transactions costs, says Halcombe Randall of Florida State University.

Despite its straightforward, intuitive nature, CBA rests on difficult choices about what are costs and what are benefits. Little agreement exists about how to calculate the impact of risk and timing on costs and benefits. The cost-benefit idea represents a trade-off between efficiency and equality in socio-economic affairs.

New Public Management (NPM) Theory

The various theories of governance accommodate that social conflicts are resolved by a sovereign from a perspective of responsibility as guided by the New Public Management theory. The NPM initiative was founded in UK in 1979 and by the year 1991, it became a major reform strategy which was adopted by many countries all around the world and practiced by most member states of the Organization for Economic Cooperation and Development (OECD). The NPM techniques for the public sector are to facilitate more transparency in government activities, to strengthen the accountability of government, and improve decision-making. This theory presumes that the government should endeavor to prudently manage her expenditure to the benefit of the citizenry. The theory also stress that the government's revenue should be well mobilized to disallow the looting of such into private pockets (Udo and Esara, 2016). These consist of resources prioritization, prioritization of programmes the budgetary process, efficient management of resources etc. (Bashir, 2016), therefore, the essence of CBA is to avoid misapplication of public fund. Therefore, NPM is a historic opportunity for developing countries to develop a more democratic political system and to improve transparency and accountability.

CBA applies to the underlying principles of recent social, economic, public sector reforms as means to improve the accountability, transparency and public sector governance. The application of CBA as part of broader financial management and public sector reforms in line with the doctrine of NPM in the developing countries may still be a mirage (Babatunde, 2017). This work is therefore anchored on Public Finance Management Theory and Pareto Theory of Improvement because it focuses mainly on the management of revenue accruing to the government for the good of the citizenry of which Cost – Benefit Analysis is a tool.

Empirical Review

Onyenmuru and Okwo (2012) examined the extent government expenditure has affected the road infrastructural development in Abia State of Nigeria considering the deplorable network of roads in the State. Time series data were gathered and tested using panel lest square. The finding revealed that the share of local infrastructural development of local governments in Abia State.

Onuorah (2018) examined the trend and empirical analysis of macroeconomics variables on government budget deficit in Nigeria for the period 1987-2016 using data from the Central Bank of Nigeria. E-views was used to test the hypotheses and the result showed that only two independent variables –exchange rate (EXCR) and Inflation rate (INFR) have positive relationship to the dependent variables (BUDFT), Interest rate (INTR) and money supply (MSUP) have negative relationship but only INFR is significantly related. Alexious (2007) study of Greece for the period 1970-2001 using Ordinary Least Square (OLS) reported a positive association between growth in government spending and GDP growth (see also Sill, 2005).

Aigbedion, Salihu and Omoniyi (2015) examined the economic impact of road transportation system in Nigeria. The research covered a period of 25years with secondary Data from the Central Bank of Nigeria and National Bureau of statistics. Multiple Regression of Ordinary Least Squares were used in analyzing the secondary data using economic variables of Gross Domestic Product (GDP) which was a function of the amount of road transportation in GDP (ROT), capital utilization (CUR), government expenditure on road transportation (GNOT), exchange rate (EXCHR), and external reserves (EXTR). The result indicated that road transportation has a positive impact on economic growth in Nigeria.

Aregbe and Greg (2015) examined the impact of government spending on economic growth in Nigeria using time series data for the period between 1970-2010. Data for this study were obtained from the Central Bank of Nigeria statistical Bulletin. Some selected macroeconomic variables such as government expenditure, educational expenditure, health expenditure, government investment expenditure and government consumption were captured in the model. After which the model was estimated. The result shows that overall government expenditure on health and transport were positive and significantly related to economic growth, while the expenditure on agriculture had an increase growth of 0.7%.

Muhammed and Akanegbu (2015) studied the impact of education expenditure on economic growth in Nigeria over the period of 1981-2010. The co-integration and Granger causality tests were used in order to analyze the causal nexus between education expenditure and economic growth to see the direction of causality between the variables used. The result revealed a co-integration between real growth rate gross domestic product, total government expenditure on education, recurrent expenditure on education and primary school enrolment. Also there is no causality between real growth rate of gross domestic product (RGDPG) and total government expenditure of education (TGVTEE) but there is bi-directional causality, between recurrent expenditure on education (REDEXP) and total government expenditure on education (TGVTEE). Primary school enrolment (PRYSE) does not Granger cause TGVTEE, the latter does Granger cause the former. No causality between REDEXP and RGDPG and also no causality between PRYSE and RGDPG.

Osundina, Ebere and Osundina (2014) examined the relationship between government spending on infrastructure and poverty reduction in Nigeria. Per capita income was used to proxy poverty reduction, government spending on infrastructure was proxied by: government spending on building and construction, government spending on transportation, government spending on education and government spending on health. Time series data of 43 years were employed and augmented Dickey Fuller unit root test showed that the variables were not stationary at level but were stationary at first differencing in the order of integration was 1 (1). The vector error correction model showed that there was a long run relationship between government spending on infrastructure and poverty reduction in Nigeria. The regression result showed that government spending on building and construction has a positive and significant effect on poverty reduction in Nigeria, while government spending on transportation has a negative and significant effect on poverty reduction. The effect of government spending on education and health were significantly negative and positive respectively.

Amadi, Amadi and Nyenke (2013) examined public spending on transport infrastructure and economic growth in Nigeria. The study employed Ordinary Least Square (OLS) regression method to analyze the data collected. The data analyzed showed that public spending on transport infrastructure is negatively related to growth and insignificant.

Methodology

The research adopted survey research design because the study deals with evaluation of opinions of respondent with regards to the focus of the study. The population comprises of staff of ministry of finance and budget office in Imo State. The researcher expect that these groups will be able to provide knowledgeable information that will be relevant in achieving the study objectives, 50 respondents were selected through purposive and simple random sampling was used to select the segment of the population useful for the study while random sampling was used in selecting the participants from the identified segments. Primary data was used by employing structured questionnaire in eliciting the required data needed to test the formulated hypotheses. The five point Linkert scale was used in developing the questionnaire. The statistical package for social science (SPSS) 20.0 will be used as the method of data analysis and multiple ordinary least square regression techniques was used to test the explanatory variables relationship with dependent variables. The study conducted also descriptive statistics and correlation matrix.

Model Specification

$$CBA = a + B_1PPF + B_2EDBR + B_3ACBCBP + B_4EAR + U_t$$

Where:

- CBA = Cost-Benefit Analysis
- PPF = Poor Policy formulation
- EDBR = Efficient Deployment of Budgeted Resources
- EAR = Execution of the Allocated Resources
- APIBP = Absence of Political Interference in Budget Process

Data Presentation and Discussion Analysis

Table I. Descriptive Statistics

	Mean	Median	Maximum	Minimum	Standard Deviation	Reliability test
CBC	2.702	1	5	1	0.457	0.76
PPF	2.821	2	5	1	0.577	0.82
EDBR	1.642	1	5	1	0.233	0.76
EAR	2.522	3	5	1	0.109	0.69
APIBP	1.879	9.97	11.66	7.87	0.790	0.68

Source: E-view 7.0

Table I represents the result for the descriptive statistics and Cronbach reliability test for internal consistency of the research instruments. As observed, the mean for Cos-Benefit Analysis (CBA) and for poor policy formulation (PPF) is 2.702 and 2.821 respectively which is within the agree option (Agree=2) and suggest that most of the respondents agree that there is CBA in budgeting of public fund and it can be instrumental to critical infrastructural transformation. This means that for efficient deployment of budgeted resources (EDBR) and poor execution of the allocated resources (EAR) are 1.642 and 2.522 respectively which is within the option of (strongly agree =1) suggest that most of the respondents strongly agree on this variables in critical infrastructural transformation. Lastly, the mean for absence of political interference in budgeting process (APIBP) is 1.879 which is within the agree option (agree =2) and suggest that most of the respondents agree that absence of political interference in budgeting process can enhance critical infrastructural transformation. The standard deviation of all the variables differ significantly from zero and this is suggestive of the spread in the responses. The maximum and minimum values of 1 and 5 results from the Linkert Scale structure of the research instrument. The reliability statistics for all the variables range from between 0.69 to 0.82 and this range is not significantly different from the 7.87 minimum level recommended by Nunally (1978). The research concludes therefore, that the questions are able to measure the research variables.

Table 2 Spearman Rank Correlation Result

	CBC	EDBR	EAR	PPF	APIBP
CBC	Corr. Coef. 1 Sig. (2-tailed) .				

EDBR	Corr. Coef.	-0591*	1			
	Sig. (2-tailed)	0.00				
EAR	Corr. Coef.	-0549*	-0.656	1		
	Sig. (2-tailed)	0.00	0.00			
PPF	Corr. Coef.	-0.154*	-0.026	-0.011	1	
	Sig. (2-tailed)	0.026	0.799	0.91		
APIBP	Corr. Coef.	-.269*	-0.376	-0.149*	-0.144	1
	Sig. (2-tailed)	0.000	0.00	0.00	0.153	

The spearman rank correlation result is presented above, however, of particular interest to the study is the correlation between cost-benefit analysis (CBA) and Poor policy formulation (PPF), efficient deployment of budget resources (EDBR), execution of allocated resources (EAR) and absence of political interference of budget resources (APIBR). The relationship between these variables is the focus of this analysis and discussion.

The result reveals that a negative correlation is observed to exist between CBA and EDBR ($r = -0.591$) which is also significant at 5% ($p = 0.000 < 0.05$) and this suggests that efficient deployment of budget resources can enhance critical infrastructural transformation. CBA appears to be negatively correlated with (EAR) ($r = -0.549$) and also significant at 5% ($p = 0.00 < 0.05$) and this also suggest that execution of allocation resources can be linked to critical infrastructural transformation. CBA also appears to be negatively correlated with PPF ($r = -0.154$) and also significant at 5% ($p = 0.026 < 0.05$) and like the analysis of prior variables, it suggests that poor policy formulation can also be negatively correlated with critical infrastructural transformation. Lastly, CBA appears to be also negatively correlated with APIBP ($r = -0.269$) and also significant at 5% ($p = 0.00 > 0.05$) and this suggests that absence of political interference in budget process can enhance critical infrastructural transformation. However, correlation analysis does not necessarily suggest causality between variables and hence there is the need to proceed to conduct regression analysis.

Table 3: Regression Result

Variables	Coefficient	Std. Error	t-Statistic	Prob.
C	- 2.19	23.77	- 2.6104	0.01
PPF	- 8.641	19.498	7.771	0.032
EDBR	- 2.506	26.948	3.932	0.041
EAR	- 0.074	18.210	4.453	0.592
APIBP	- 0.390	12.920	4.900	0.011
R-Squared	0.620			

Adjusted R-Squared	0.413
Durbin Watson Stat	1.753
F-Statistic	23.454
Prob(F-Statistic)	0.00

Source: SPSS 20.0

$\therefore \text{CBC} = 2.19 - 8.641 \text{ PPF} - 2.506 \text{ EDBR} - 0.074 \text{ EAR} - 0.390 \text{ APIBP} + \text{Ut}$
(0.01) (0.032) (0.041) (0.592)
 $R^2 = 0.620$ D.W Stat. = 1.753
F = 23.454 Prob. (F-stat) = 0.00

The regression equation is a multiple regression model and it examines the relationship between critical infrastructural transformation and all the explanatory variables (PPF, EDBR, EAR, and APIBP) examined together. As observed, the $R^2 = 0.620$ which shows that the model explains about 62% of the systematic changes in critical infrastructural transformation while other factors not included and captured by the stochastic error term explains the remaining 38%. The equation shows that poor policy formulation (PPF) is negative (-8.614) and efficient deployment of budget resources (EDBR) is negative (-2.506). The result is in tandem with theoretical expectation and indicates that poor policy formulation and inefficient deployment of budget resources can reduce critical infrastructural transformation. The result is also statistically significant at 5% levels as the P-values of both variables (0.031 & 0.041) are less than 0.054. Also, execution of allocated resources is negative (-0.074) and absence of political interference in the budget process (APIBP) is also negative (-0.390) and this implies that both variables can enhance critical infrastructural transformation. However, only APIBP appears to be significant at 5% as the P-value (0.011) is less than 0.05 ($P < 0.05$). The F-stat value of 23.454 is significant at 5% as $P < 0.05$ and confirms statistical significance of the model and that significant linear relationship exists between the independent and dependent variables. The Durbin Watson statistics of 1.753 is close to 2 and hence we reject the presence of first order serial correlations and hence the regression coefficients will not be biased.

Conclusion and Recommendations

The paper examined the cost-benefit analysis in budgeting public fund for critical infrastructural transformation in developing world. It examined the relationship between the dependent and independent variables: Cost-Benefit Analysis (CBA) and Poor Policy Formulation (PPF); Efficient Deployment of Budget Resources (EDBR); Execution of Allocated Resources (EAR); and Absence of Political Interference on Budget Resources (APIBR). The result reveals that CBA is negatively correlated to

PPF, EDBR, EAR and APIBR. In other words, poor policy formulation, inefficient deployment of budget resources, execution of allocated resources and political interference on budget resources are experienced, because cost-benefit analysis are not considered on the budget formulation, preparation and implementation.

Based on the foregoing, the paper recommends the following policy measures to alleviate the problem of ignoring the cost-benefit analysis in the provision of critical infrastructure in Nigeria:

- Policymakers and decision makers in the budget office and economic planning, and ministry of finance should always consider the application of cost-benefit analysis in the preparation, formulation and execution of budget in the developing countries of the world.
- The growth in critical infrastructural transformation is closely and positively related to diversification, which holds one part of the key that brings development and prosperity in a developing world. Therefore, a ministry for critical infrastructural development should be created to facilitate infrastructure development.
- Developing nations should promote global and national infrastructure investment and exhibitions, which bring together the public sector officials, key decision makers and the investing private sector with the objective of accelerating infrastructure investments and bridge the gap in infrastructure using public-private partnerships.

References

- Ahmad, H. & Miller, S.M. (2000). Crowding-out and crowding-in effect of components government expenditure. *Contemporary Economic Policy*, 18: 124 – 133
- Aigbedion, I.M.; Salihu, D.S. & Omoniyi, K.I. (2015). The impact of road transportation on economic growth in Nigeria: 1986 – 2013. *International Journal of Education and Research*, 3(9), 295 – 301
- Alexious, C. (2007). Unraveling the mystery between public expenditure and growth: Evidence from Greece. *International Journal of Economics*, 1(1), 21 – 31
- Amadi, C.; Amadi, W.N. & Nyenke, C.U. (2013). Public spending on transport infrastructure and economic growth in Nigeria: 1981 – 2010. *Journal of Sociological Research*, 4(2), 438 – 436
- Aregbe, T.A. & Greg, E.E. (2015). An analysis of government spending on economic growth in Nigeria. *International Journal of Development Research*, 05(06), 4864 – 4882
- Babatunde, S.A. (2017). Implementing international public sector accounting standards in Nigeria: Issues and challenges. *International Journal of Business, Economic and Law*, 12(1), 1-12
- Bashir, T.M. (2016). Effects of treasury single account on public management in Nigeria. *Research Journal of Finance and Accounting*, 7(6), 164 – 166
- Ebo, E.C. (2014). *Using research to influence public policy what works and how*. Abuja: IPPAM
- Ezeobi, J.N. (2011). *Advance course on principles and practice of management theory and application*. (2nd ed.) Enugu: Snaap Press Ltd
- Fabunmi, O. (2016: March, 9). We need infrastructure investment, effective public-private partnership to grow. *The Guardian*, 32(13585)
- Mgbemena, E.M.; Akamobi, A.; Ogunanobi, C.; Ibekilo, B.C. & Ekesiobi, C.S. (2015). Food security challenge in Africa and the missing infrastructure link. *Proceedings of the 2nd Interdisciplinary Conference of Chukwuemeka Odumegwu Ojukwu University Igbariam Campus, held September, 2 – 5*

- Muhammad, M.Y. & Akanegbu, B.N. (2015). Education expenditure and economic growth in Nigeria: Granger causality analysis. *Journal of Business Management and Economics*, 3(4), 1 – 6
- Nwaneri, C.J. & Obiah, M.E. (2016). Cost-benefit analysis as a criterion for decision-making on public funding of projects in the contemporary change budget to enhance entrepreneurship in a globalization era. *Proceedings of the 4th Interdisciplinary International Conference*, 4(1), 98 – 107
- Nwaneri, C.J.; Obiah, M.E. & Nwachukwu, C.M.C. (2016). Rural electrification infrastructure in Nigeria's challenging economy: An energy sector reform strategy to promote entrepreneurship for sustainable development. *Proceedings of 4th Annual ASUP/PortPoly Conference*, 583 – 590
- Nweze, A.U. (2004). *Profit planning a quantitative approach*. Enugu: M'Cal Communication International
- Nweze, A.U. (2016). *Quantitative approach to management accounting (performance management)*. (7th ed.). Enugu: Sparkle & Sparkle Ltd
- Oke, I. (2016, March, 9). Beyond the padding of 2016 budget. *The Guardian* 32(13), 585
- Okeke, O.A. (2001). *Foundation statistics for business decisions*. (Revised ed.). Enugu: MacroAcademy Publishers
- Onuegbu, R.C.; Onwuka, E. & Obiah, M.E. (2015). From millennium development goals to sustainable development goals: The disconnection of third world communities. *African Journal of Sustainable Development*, 2(1), 45 – 68
- Onuorah, A.C. (2018). The impact of macroeconomic variables on budget deficit in Nigeria. *Proceedings of the 3rd International Conference of Faculty of Management Science Chukwuemeka Odumegwu Ojukwu University Igbariam Campus*, held 4th – 6th July, Pp. 391 – 404
- Onyenmuru, N.M. & Okwo, I.M. (2017). Government expenditure and road infrastructural development in local government areas in Abia State, Nigeria. *Research Journal of Financial Sustainability Reporting*, 2(2), 144 – 154
- Osundina, C.K.; Ebere, C. & Osundina, O.A. (2014). Disaggregated government spending on infrastructure and poverty reduction in Nigeria. *Global Journal of Human-Social Science: Economics*, 14(5), 1 – 7
- Oyedele, O.A. (2012). The challenges of infrastructure development in democratic governance. *Paper presented at the FIG Working Week 2012 Rome, Italy, May 6 – 10*
- Sill, K. (2005). Do budget deficits cause inflation? *Business Review*, 26 – 33
- Udo J.E and Esera I.E. (2016). Adoption of treasury single account (TSA) by state governments of Nigeria. Benefits, challenges and prospects. *Journal of finance and accounting*, 4(3) 126-130.
- Umoru, H.; Ovuakporie, E. & Agbakwuru, J. (2016: December, 23). Budget 2016 'll revive economy, says Buhari. *Vanguard* 25(62655)