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BUDGET APPROPRIATION RISKS IN PROCUREMENT OF CONSTRUCTION PROJECTS OF PUBLIC TERTIARY INSTITUTIONS IN NIGERIA

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ABSTRACT

In Nigeria, the construction budget stage is regarded as one of the most important phases of the public procurement procedure. Construction clients' top priorities are projects that are completed on schedule, within budget, with the desired level of quality, and without compromising. However, there are numerous hazards at this stage that affect the parties to the contract and the goals of the project. In order to guarantee the successful completion of construction projects, this article sought to evaluate budget risk management strategies for tertiary institutions' construction procurement in Nigeria. 150 structured questionnaires were distributed to purposively selected construction professionals from procurement and physical planning departments of tertiary institutions in three states and the Federal Capital Territory as part of the study's survey

Introduction

Globally, procurement systems have changed in tandem with advancements and enhancements in service provision. However, in certain developing nations, the systems are not widely accepted (Yevu *et al.*, 2022). Nigerian public sectors continue to use the traditional procurement system, which has been widely criticized for being ineffective (Abdullahi, 2023). It is well known that corruption and poor management plague this procurement system (Ebenezer *et al.*, 2019). Public tertiary institutions in Nigeria are typically required to adhere to "due process" when it comes to

design approach. To determine the most significant risk factors in the budgeting stage of the procurement process, the gathered data was analysed using the Relative Importance Index (RII). To ascertain how the identified construction budget risk factors affected the parties involved and the project's goals, regression analysis was utilized. According to the study, the key budget risk factors in construction procurement are an unprecedented increase in material prices (RII=0.97), delays in budgetary approval (RII=0.87), and an inadequate market price forecast (RII=0.88). The study also discovered that, with p-values below the 0.05 significance level, the budget risks have a statistically significant effect on the project's goals in terms of time, cost, quality, safety, and the environment, as well as the contract's parties. It came to the conclusion that if the budget risk factors changed, the project objectives would also change. The study further recommended that Government should do its best at passing and implementing the nation's budget without delays to prevent the effect of inflation.

Keywords: Appropriation, Budget, public procurement, Risks and Tertiary institutions

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their procurement agreements (Akinradewo *et al.,* 2022). Except in extremely rare cases, public tertiary institutions are required by the Procurement Act of 2007 to use the design-bid-build procurement method (Akinradewo *et al*., 2022). Additionally, the majority of Nigeria's public tertiary institutions' procurement management procedures do not fully conform to the Public Procurement Act of 2007 (Oso, 2017). Similar to this, many public tertiary institutions' actual procurement costs typically surpass 10% of their budgeted amount, which raises operating expenses (Oso, 2017). Conflict of interest, poor project technical feasibility, lack of transparency, lack of bid and cost indices, low managerial and technological skills of contractors, lack of bidder competition, overestimation of work item quantities, and inappropriate procurement strategy are some of the inherent risks that frequently confront the public procurement process (Dahiru and Bashir, 2015; Oso, 2017). However, these risks and management strategies are given less attention in procurement process of most tertiary institutions in Nigeria and thus, some of the projects are being delayed unnecessarily, and having impact on cost, time and quality objectives of the projects (Emeka, 2016; Bamidele, 2020). Abdul-MannanHussain *et al.* (2017) stated that ineffective management of risks factors would lead to dispute, claims, litigation and hence having an impact on the contracting parties (client, contractors and consultants).

This stage is primarily faced with risks of an unprecedented increase in material prices, delays in budgetary approval, inadequate market price forecasting, political interference, an inexperienced budgeting team, delays in disbursing funds, and a lack of funds. Generally, budgets are not expected to be exceeded; otherwise, the entire project may fail (Bamidele, 2020; Moses *et al.,* 2021). According to Dahiru and Bashir (2015), any procurement management system should prioritize efficient risk control and risk reduction. According to Waziri and Isa (2017), effective risk management in public procurement requires a thorough grasp of the primary risk categories because a lack of knowledge would result in subpar risk assessment and monitoring, which would negatively affect time, cost and quality objectives of a project. It is against this backdrop, that this paper aims to assess budget appropriation risks management techniques for construction procurement in tertiary institution in Nigeria with a view to ensuring effective delivery of projects.

LITERATURE REVIEW

Budget appropriation in procurement process

The establishment of an appropriate budget and time schedule is critical to the success of a construction project. The client and the design consultants must agree on the anticipated cost early during the planning stage. This is a critical stage in the cost management process since an inaccurate budget can lead to poor project performance. Inaccurate budget may lead to quality compromise and variations with neither the client, end-user, nor design team being completely satisfied at the end (Moses *et al,* 2021). The main concerns of construction clients is projects to be delivered within budget, on time, and to the expected quality without compromise (Rogers *et al.,* 2024). Potts (2008) established that most clients work within tight pre-defined budgets prepared by a consultant Quantity Surveyor during design development. This budget is normally not expected to be exceeded; otherwise, the whole project may fail. Moses *et al.* (2021) stated that one indicator of whether a project has succeeded is whether or not it stays within the bounds of the budget. Therefore, establishing accurate estimates for all the project's cost that results in a budget plan is necessary, since the budget plan helps in tracking the full project in accordance with the budget.

Risks in construction budget

According to the Association for Project Management (2017), risk is an uncertain event or a set of circumstances which will impact on the achievement of one or more

project objectives in terms of cost, time and quality. The effect of risk on a project can be positive or negative. However, to align with the common usage of the word risk, this study embraces risk as the extent and impact of adverse occurrences causing a construction project to exceed its predicted budget or cost plan sum (Odeyinka *et al.,* 2012). Abdullatef (2020) identified budget risks to include inadequate forecast of market price, inexperience budgeting team, political interference, inaccurate cost estimation, currency fluctuation, delays in budgetary approval unprecedented material price increase. The study by Moses *et al.* (2021) found that delays in disbursing funds and a lack of available funds as a result of poor budget execution negatively affected the efficiency and effectiveness of the Country public healthcare system. In addition to planning difficulties, limited finance hindered the implementation of the planned projects, causing several to be postponed or cancelled altogether.

Effect of risks in construction budget

Alintah-Abel *et al.* (2025) observed that the expertise of consultants, quality of information and flow requirements, project team's experience of the construction type, tender period and market condition, extent of completion of pre-contract design, complexity of design and construction, and availability and supplies of labour and materials are the main factor causes of budget overruns in building projects in developing countries like Nigeria. Similarly, Fashina *et al.* (2021) added that underestimation, site investigation, changes in project scope, defective design, and inadequate specification to be major risk factors impacting budget variability. Equally, similar study by Daoud *et al.* (2023), based on contractors' perspectives, identified complexity of design and construction, scale and scope of construction, method of construction, tender period and market condition, site constraints, the client's financial situation as risks causing budget overruns in construction projects. If risks are properly identified and managed project would be executed within budget.

Procurement Risks Management Techniques

In the context of construction project management, risk management is a thorough and methodical approach to recognizing, evaluating, and mitigating risks in order to meet project goals. It is necessary to identify the risks associated with each stage of the construction procurement process. Planning, identification, analysis, response, monitoring, and control are the six overlapping stages of procurement project risk

management that Gbadebo (2012), Kalam (2017), Koul *et al*. (2018), and Nawaz *et al*. (2019) proposed.

RESEARCH METHODOLOGY

This research employed the survey design approach utilising the features of quantitative method by administering well-structured questionnaires to the respondents. The sample frame for the study constituted the Procurement officers, Architects, Quantity Surveyors, Builders, Engineers, and contractors in procurement and the physical planning units, in selected public tertiary institution in Kwara, Kogi, Niger States and the Federal Capital Territory. A total of 150 questionnaires were administered to the purposively selected professionals, 112 were returned and found valid for analysis. This represents a response rate of 74.66% which is considered adequate for analysis. To analyse the collected data in this study, both descriptive and inferential analytical tools were utilised. The descriptive methods included Relative Importance Index (RII) and rankings. The RII was used to identify relatively the most important risks factors in the budget appropriation of procurement process. The RII values of 0.75 and above were deemed high or important (Morenikeji, 2006). Regression analyses were used to determine the impact of the identified bid evaluation risk factors on parties and as well as on project objectives. The data on risk factors were the independent variables and data on the impact of the identified bid evaluation risk factors on parties and on project objective were dependent variable.

RESULTS AND DISCUSSION

Demographic Information

Table 1 shows demography of the respondents. Four percent (4%) of the respondents were directors; seven percent (7%) were deputy directors; eleven percent (11%) were head of departments; seventy-eight (78) were others. Similarly, sixty percent (60%) of the respondents were HND/ BSc/ B Tech holders; thirty seven percent (37%) of the respondents were MSC/ MTech holders while three percent (3%) of the respondents were PhD holders. Also, forty-three (43%) percent of the respondents were having 6-10 years of experience in procurement exercise; forty-six (46%) percent of the respondents were having 11-15 years of experience in procurement exercise; while eleven (11%) percent of the respondents were having 16 years and above experience. Equally, seventeen (17%) percent of the respondent were procurement officers with professional affiliation; forty-six (46%) percent of

the respondents were quantity surveyor; twelve (12%) percent of the respondents were Architects; fourteen (14%) percent of the respondents were Builders and eleven (11%) percent of the respondents were engineers.

Table 1: Demography of respondents

	Frequency	Percentage
Position of respondents in procurement unit or physical planning unit		
Director	4	4
Deputy director	8	7
Head of dept/ unit	12	11
Other	88	78
Total	112	100
Academic Qualification		
HND/ B.Sc. /B.Tech	67	60
MSC/ MTech	42	37
PhD	3	3
Total	112	100
Years of experience in procurement exercise		
0-5	0	0
6-10	48	43
11-15	52	46
16 above	12	11
Total	112	100
Professional affiliation		
Procurement officer	19	17
Quantity surveyor	52	46
Architecture	13	12
Builder	16	14
Engineer	12	11
Total	112	100

Construction procurement budgetary risk factors

The results in Table 2 shows that unprecedented material price increase was ranked 1st with RII value of 0.97, Delays in budgetary approval was ranked 2nd with RII value of 0.94, inadequate forecast of market price was ranked 3rd with RII value of 0.88, inexperience budgeting team was ranked 4th with RII value of 0.84. Political interference was ranked 5th with RII value of 0.80, and inaccurate cost estimation

was ranked 6th with RII value of 0.79. The risks were deemed high because they had RII values of 75% and above. This has been backed up by Vani (2011) research, which found that increase in public spending as result of waste, abuse, and fraud in public procurement invariably decrease government revenues, and this partly explains budget deficit facing many countries in which public sector procurement is characterised by massive corruption. These results corroborate the findings of Mohammad *et al.* (2015) who acknowledged that the problem affecting construction procurement in Nigeria are political influence, administrative bottlenecks, poor planning, insufficient budgeting plans, inappropriate procurement methods, delays in budgetary approval, lack of fiscal transparency and public accountability, kidnappings, vandalism, civil unrests as common challenges. Odeyinka and Dada (2016) established that incessant increase in the cost of construction projects over and above what is budgeted for in the contract has been a major concern to the construction industry as a whole.

Table 2: Construction Procurement Budget Risk Factors

S/N	Construction procurement Budget Risk factors	RII	Rank	Interpretation
1	Unprecedented material price increase	0.97	1	Very high risk
2	Delays in budgetary approval	0.88	2	High risk
3	Inadequate forecast of market price	0.88	3	High risk
4	Inexperience budgeting team	0.84	4	High risk
5	Political interference	0.80	5	High risk
6	Inaccurate cost estimation	0.79	6	High risk
7	Currency fluctuation	0.77	7	High risk

Source: Researcher's field survey

Impact of construction procurement budget risk factors on project objectives

From table 3, the result of simple linear regression analysis conducted to test the impact of budgetary risk factors on project objectives (time, cost, quality, environment, and safety). The result shows that the predictors expressed 92.40%, 90.20%, 77.70%, 81.50%, and 93.00% of the variances (R^2=0.924, p<0.034; R^2=0.902, p<0.029; R^2=0.777, p<0.012; R^2=0.815, p<0.175, R^2=0.930, p<0.000) for time, cost, quality, and safety, and environment respectively. These imply that these procurement risk factors would lead to delays in procurement process, which could slow the commencement of a project. Moreover, the same risk factors would

result to cost overruns as the project team may need to secure additional fund to continue or complete project and these could lead to compromise in quality from procurement of substandard materials through to poor workmanship and delivery of substandard project. These risk factors could also lead to rushed decision-making which would impact on project safety and the needed resources to implement environmentally friendly practices. The results therefore infer that persistent budgetary risks would impact on project duration, project cost, project quality, safety and meeting environmental requirements. These results corroborate the findings of Gitau (2015) who established that appropriate budget and on time budgetary approval are critical to the success of a construction project. Subsequently, inaccurate budget can lead to quality compromise and poor project performance. According to Pinamang *et al.* (2018) inaccurate cost estimation and political interference could result to high project time and cost overruns, job abandonment, improper contract determination, conflicts and litigations, and defective job performances.

Table 3: Impact of Construction Procurement Budget Risks on Project Objectives

BSN	Variables X	Y	Type of model	Inference R	R^2	P value	Strength of relationship	Remarks
1	Budgetary risks factors	Impact on Time	Linear regression	0.961	0.924	0.034	Very strong	SS
2	Budgetary risks factors	Impact on cost	Linear regression	0.950	0.902	0.029	Very strong	SS
3	Budgetary risks factors	Impact on Quality	Linear regression	0.881	0.777	0.012	Very strong	SS
4	Budgetary risks factors	Impact on Safety	Linear Regression	0.903	0.815	0.175	Very strong	NS
5	Budgetary risks factors	Impact on Environment	Linear regression	0.964	0.930	0.000	Very strong	SS

Source: Researcher's field survey

Impact of construction procurement budget risk factors on parties

Table 4 shows the result of the simple linear regression analysis conducted to test the impact of budget appropriation risk factors on contract parties (clients, contractors, and consultants). The result shows that the predictor expressed 69.90%, 91.90% and 72.50% of the variance (R^2=0.699, p<0.007); (R^2=0.919, p0.000<0.05); and (R^2=0.725, p<0.010) for clients, contractors, and consultants

respectively. These results imply that procurement budget appropriation risk factors significantly impact on project clients, contractors, and consultants respectively during procurement process. These depict that any budget appropriation risk factors that is not properly managed would result into a negative impact on the parties. For instance, financial difficulties might be faced by the parties due to irregular cash flow as a result of the risks factors which would lead to cutting of corners or compromising quality struggling to stay within the budget. Moreover, project execution might be delayed, there would be difficulty to provision of required expertise services which would impact on professional reputation of the parties. The results corroborate the findings of Johnson *et al.* (2016) and Ceocea *et al.* (2020) who established that the consequence of bad estimate at the early stage of a construction project includes embarking on an infeasible project and rejecting feasible project. Similarly, Abdul-Mannan-Hussain *et al.* (2017) noted that ineffective management of risks factors would lead to dispute, claims, litigation and hence having an impact on the contracting parties.

Table 4: Impact of Construction Procurement Budget Risks on Parties

B S/N	Variables X	Y	Type of model Model	Inference R	R^2	P value	Strength of relationship	Remarks
1	Budget Appropriation	Impact on client	Linear regression	0.836	69.9%	0.007	Very strong	SS
2	Budget Appropriation	Impact on contractor	Linear regression	0.958	91.9%	0,000	Very strong	SS
3	Budget Appropriation	Impact on consultant	Linear regression	0.851	72.5%	0.010	Very strong	SS

Source: Researcher's field survey

Risks response techniques for construction procurement budget

Table 5 shows the key procurement risk response strategies for construction budget where risk reduction through the use of (contingency planning; separation or relocation of activities and resources; contract terms) was ranked 1st with RII value of 0.90, transfer or share the risks through insurance was ranked 2nd with RII value of 0.88, retain or accepting the risks e.g. for low level risks was ranked 3rd with RII of 0.85, risks avoidance/prevention through (detailed planning, alternative approaches, protection and safety systems, reviews of operation, regular

inspections, training and skills enhancements) was ranked 4th with RII value of 0.82, Bond and guarantees agreement was ranked 5th with RII value of 0.80 and escrow agreements was ranked 6th with RII value of 0.79, They were deemed important because the fall between RII values of 75% and above. Therefore, to respond to construction budget risks, it involves detail contingency planning; separation or relocation of budgetary activities and resources, and use of contract terms. Also, transfer or share the risks through insurance cover could be used as a response technique. Similarly, to avoid /prevent budget risks could be achieved through detailed planning; alternative budget approaches; reviews of budget operation; regular budgeting exercise inspections; training and skills enhancements for budget team. These results are in corroboration with the findings of Ali and Nima (2017) and Abdullatef (2020) who established that risks response aimed at drawing up strategies for risks. These strategies are divided into two groups: The first is strategies to respond to negative risks which could be achieved through (avoidance strategy, transfer strategy, reduction strategy, and acceptance strategy). The second group is strategies for response to positive risks (exploit strategy, sharing strategy, improvement strategy and acceptance strategy).

Table 5: Risk Response Techniques for Construction Procurement Budget

S/NO	Budget Risk Response Techniques	RII	Ranking	Interpretation
1	Reduction (Contingency planning separation or relocation of activities and resources; contract terms)	0.90	1	Very important technique
2	Transfer or share the risks through insurance	0.88	2	Important technique
3	Retain or accepting the risks e.g., for low level risks	0.85	3	Important technique
4	Avoidance/prevention of the risks (detailed planning; alternative approaches; reviews of operation; regular inspections; training and skills enhancements)	0.82	4	Important technique
5	Bond and guarantees agreement	0.80	5	Important technique
6	Escrow agreements	0.79	6	Important technique
7	Insurance cover	0.74	7	Important technique

Source: Researcher's field survey

DISCUSSION OF FINDINGS

This research presented a study of Budget appropriation risks in procurement of construction projects of public tertiary institutions in Nigeria. The construction

procurement budgetary risk factors were examined and unprecedented material price increase, Delays in budgetary approval, inadequate market price amongst others were identified as risk factors. This implied that the procurement risk factors would lead to delays in procurement process which would also slow the commencement of a construction project and could lead to cost overruns. Furthermore, the findings also revealed that any budget appropriation risk factor that is not properly managed, would result in negative impact on the construction parties (clients, contractors and consultants) which could include financial difficulties, difficulty of provision of required expertise amongst others.

The procurement risk response techniques were examined, risk reduction, transfer or share the risks through insurance, retain or accepting the risks, risk avoidance amongst others were identified as important factors that could help in responding to the risks.

CONCLUSION

A study of Budget Appropriation Risks in Procurement of Construction Projects of Public Tertiary Institutions in Nigeria was undertaken. 150 questionnaire was administered to procurement officers, Quantity surveyors, Architects, Builders and Engineers in some selected tertiary institutions. Based on the findings it can be concluded that Construction budget risk is confronted with unprecedented material price increase, delays in budgetary approval, inadequate forecast o market price and these factors affect project time, cost, quality, safety and environment which in turn affects the clients, contractors and consultants. To respond to construction budget risks, contingency planning, separation of budgetary activities and resources, and use of contract terms are strategies that could be used.

RECOMMENDATIONS

The study recommends that the Government should do its best at passing and implementing the nation's budget without delays to prevent the effect of inflation on material and other costs which in turn affects construction budgets.

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