

BUDGET OVERRUNS EXPERIENCED ON TERTIARY INSTITUTIONAL BUILDING PROJECTS – RECOURSE TO THE CONTRACTORS' RELATED FACTORS

¹Adedokun, O.A., ²Akinmusire, A.O. & ³Abiola-Ogedengbe, D

^{1&3}Department of Quantity Surveying; School of Environmental Technology
Federal University of Technology, Akure, Nigeria

²Department of Quantity Surveying; Faculty of Environmental Studies
Rufus Giwa Polytechnic, Owo, Nigeria

*Corresponding author: fisayoadedokun@gmail.com

Abstract

This paper examined the contractors' related factors that are causing budget overruns on tertiary institutional building (TIB) projects in south western part of Nigeria. Survey method was adopted and one hundred and twenty (120) questionnaires administered on the respondents. It was discovered that delay in delivery of materials to site, poor skills and experience of labour and financial problems, shortage of materials on site and lack of contractors' staff on site were the bane of cost overrun experienced on construction projects. The study recommended adequate and timely planning in terms of providing schedule for ordering materials (both quantity and time) and the list of suppliers so as to avoid delay in delivery of materials to site. Experienced labours with adequate skills are to be used, while making readily available another source for financing the projects aside total dependency on monthly valuation to avoid financial difficulty. This study has served as eye opener to the critical CRF that should be accorded high priority to avert budget overruns.

Keywords: Budget overrun, building projects, contractors' related factors, Nigeria, tertiary institutions, tendering methods.

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INTRODUCTION

Construction industry is vital for the economic growth and development of a nation, as it has forward and backward linkages with other sectors of economy (Durdyev, Omarov, & Ismail, 2017). Having realized that it has a great effect on the Gross Domestic Product (GDP), it also provides the required infrastructures to improve the quality of life (Durdyev and Ismail, 2012). Cost is considered to be the most influential aspect of the construction management system and as one of the main drivers of the project success while others are time and quality (Durdyev, Ismail, and Abu Bakar, 2013; Rahman, Memon, and Abd Karim, 2013). Be it in developing or developed countries, most of the construction projects are being faced with cost overrun when executed and this makes it a chronic problem in global perspective (Azhar, Farooqui, and Ahmed, 2008). Studies in Nigeria also affirm that the lingering problem facing the construction industry bothers on time overrun and cost overrun coupled with lack of good quality of its end product (Aibinu and Jagboro, 2002; Garry, 2005; Ogunsemi, 2002).

However, cost overruns are frequent happenings and are tremendously associated with nearly all projects in the construction industry. It is not uncommon to see construction projects failing to achieve their mission of creating facilities within the specified cost limits (Emmanuel et al., 2017). Cost overruns occur in every construction project and its magnitude varies appreciably from project to project. So it is essential to evaluate the magnitude at which it impacts or affects construction works in totality. The successful execution of construction projects to meet the required estimated standard requires huge planning from inception. According to Chalabi et al. (1984), adequate planning at the inception of a project is crucial towards reduction in budget overrun. Therefore this study examines the budget overrun experienced on tertiary institutional building projects with particular attention to the contractors' related factors.

LITERATURE REVIEW

The subject of cost overrun is a major concern in the construction industry. Many researchers have found this aspect of study worthy of investigation and have resulted in exhaustive studies arriving at a huge number of concepts and definitions. This section reviews a number of studies along the subject matter of cost overruns which could as well be regarded as budget overruns and the contractors' related factors.

Cost Overrun

Cost overrun is basically the amount by which the actual costs of a project exceeds the baseline or initially approved costs (Emmanuel et al., 2017). Zhu et al. (2004) define cost overrun as the excess of actual cost over budget and can sometimes be referred to as cost escalation, cost increase, or budget overrun. Recent study according to Tony (2017) opines that cost overrun is a phenomenon that reduces the effectiveness of investments and requires additional finance to be raised. Based on the foregoing, various researchers have defined it in a number of ways which are quite coherent and consistent. In essence, it was noted that a negative knock-on effect is created in the wider economy as a result of the diversion of funds from other projects consequent upon contracts cost overruns on public works. In the private sector the additional costs must be fully funded from reserves or borrowed. Poor cost performance either reduces or eliminates profit margins within the contracting organization. This, in extreme cases, may lead to project or company failure (Hongtao, 2014). Cost overruns are a major concern for construction contractors, clients and other team member that makes up construction work. They have the chance of causing disputes, frustrate project proceedings, and strain ongoing business transactions and relationship. Preventing cost overruns, therefore, is a key concern during the execution of construction projects.

Contractors' Related Factors (CRF)

Abhimanya and Pravin (2013) opine that contractors' related factors have very severe significant effect on project. Improper allocation of workers by the contractor may lead to improper finishing of work which may lead to rework of such item of work. Rework on any construction project is tantamount to cost overrun (Oyewobi et al., 2011). Chintan *et al* (2015) identify some factors, which are contractors' related, that occasioned cost overrun. The factors are not the same for various projects but vary according to numerous authors based on the review of past studies. Mistakes during construction, lack of experience of technical expertise which may lead to reworking and affect cost, abandoning of work midway by the contractor may result in huge losses to the project leading, and delay in the delivery of materials to site are some put forward according to Chintan et al. (2015). Others include poor skills and experience of labour, financial problems, equipment's and tool shortage on site, shortage of materials on site, poor workmanship, poor site management, low productivity of labour, shortage of site labour, lack of site contractor's staff lack of subcontractor's skills coordination problems with others (Chintan *et al.*, 2015). Omole (1986) reveals that aside other functions, contractor is expected to assemble and allocate the resources of labour, equipment and materials to the project. This is to ensure that maximum efficiency in terms of time, quality and cost is achieved at completion (Okpala & Aniekwu, 1988).

RESEARCH METHODOLOGY

Survey method was adopted in this study with primary data collected through structured questionnaires that were administered on the key professionals of completed TIB projects. The professionals included Quantity Surveyors, Architects, Builders and Engineers consequent upon their direct involvement in the execution of the TIB projects. The methods of procurement for the TIB projects considered in this study were competitive via open and selective tendering. While tables were employed for data presentations, the analysis of the collected data was carried out using both the descriptive and inferential statistical tools. Percentiles was used in analyzing the general characteristics of the respondents such as years of working experience, academic and professional qualifications while mean was not only used in determining the average years of working experience acquired by the respondents but also in ranking of items rated on a 5-point likert scale. Student T-test was employed in the study work to determine and examine the existence of significance difference or otherwise for the hypothesis stated.

Researches can be classified into positivist or the interpretative paradigm or philosophy and if a research reflects the principles of positivism, then it has taken the stance that there is a reality out there waiting to be discovered and this reality could be measured and assessed objectively (Wong et al, 2012). This study has adopted the positivism paradigm by assessing budget overruns experienced on tertiary institutional building projects with recourse to the contractors' related factors (CRF) in Nigeria. According to McGregor and Murnane (2010), rigour ensures that scientific results stems from standard and accurate means in research and such needs to be established. Adedokun, Ibiro and Olanipekun (2013) relate rigour to legitimizing research process; where validity and reliability are the tests of rigour in positivist (quantitative) research. Wong et al. (2012) added a third criterion (sensitivity) to validity and reliability as means of ensuring good measuring instrument. Sensitivity is the ability of research instrument to capture the variability in responses and 5-point likert scale was advocated

because it allows for optimum choice of response (Adedokun et al., 2013); and thus was adopted in this study. The reliability analysis of the constructs used in this study was carried out using Cronbach's alpha test. The alpha values of 0.917 and 0.976 (Table 1) for TIB projects procured under open and selective competitive tendering methods respectively. The implication of the alpha values is that the research instrument adopted for the study is reliable being greater than 0.70 and tends towards 1.0 (Kothari, 2009; Sushil and Verma, 2010).

Table 1: Reliability Analysis of the Constructs

Scale of measures	Competitive Tendering Methods	
	Open	Selective
Contractors' Related Factors (CRF)	0.917	0.976

Background information of the respondents to the survey

This shows that out of the One hundred and twenty (120) questionnaires administered on the respondents, 78 were filled, returned and found fit for the analysis. The analyzed questionnaire represented 65% of the total questionnaire sent out which is considered sufficient for the study (Oke and Ogunsemi, 2009).

Table 2: Demographics of the respondents

Category	Classification	Frequency	Percent
Profession Of Respondents	Quantity Surveying	18	23.08
	Architecture	15	19.23
	Building	9	11.54
	Engineering	36	46.15
	Total	78	100.00
Year Of Working Experience	1 – 5	5	6.41
	6 – 10	33	42.31
	11 – 15	20	25.64
	16 – 20	8	10.26
	21 – 25	6	7.69
	26 – 30	6	7.69
Mean	12.68	Total	78
Professional Membership Type	Probationer	18	23.08
	Corporate	60	76.92
	Fellow	0	0.00
	Total	78	100.00
Highest Academic Qualification Obtained	HND	7	8.97
	B.Sc/B.Tech/B.Eng	28	35.90
	Pgd	23	29.49
	M.Sc/ M.Tech	20	25.64
	PhD	0	0.00
Total	78	100.00	

From Table 2, majority of the respondents are Engineers having 46.15% comprising 23.08%, 8.97% and 14.10% of Structural Engineers, Mechanical Engineers and Electrical Engineers respectively. 23.08% of the respondents are Quantity Surveyors while the Architects represented 19.23%.

Analysis of the Table 2 reveals that majority of the respondents are B.Sc./ B.Tech/B.Eng holder with 35.90% and closely followed by respondents with additional higher qualification of Postgraduate Diploma (PGD) representing 29.49%, while the third category has M.Sc. certificates as their highest qualification obtained with 25.64% and 8.97% having HND as highest qualification.

Regarding the years of working experience possessed by the respondents, it can be seen that most of the respondents are within 6 – 10 years of experience being 42.31% of the total respondents. On the average, the respondents had an average of 13years working experience. Based on the foregoing, experience and the information supplied by this category of professionals are considered adequate and reliable for this analysis.

Table 3: Contractors' Related Factors that trigger budget overrun

Factors	Competitive Tendering Methods			
	Open		Selective	
	Mean	Rank	Mean	Rank
Delay in delivery of materials to site	3.44	1	2.44	1
Poor skills and experience of labour	3.36	2	2.12	7
Financial problems	3.28	3	1.96	11
Equipment's and tool shortage on site	3.28	4	2.16	5
Shortage of materials on site	3.24	5	2.36	2
Poor workmanship	3.04	6	2.16	5
Poor site management	3.00	7	2.00	10
Low productivity of labour	3.00	8	2.20	4
Shortage of site labour	2.96	9	2.12	7
Lack of contractor's staff on site	2.92	10	2.28	3
Lack of subcontractor's skills	2.88	11	1.96	11
Coordination problems with others	2.76	12	2.04	9
Average Means	3.10		2.15	

Table 3 indicates that during open tendering method of execution of TIB projects, it was noted that the contractor's delay in delivery of materials to site, poor skills and experience of labour and financial problems are the top three CRF that trigger budget overrun in TIB projects (M.S. = 3.44, 3.36 and 3.28) respectively while prominent among TIB projects procured under selective tendering method are delay in delivery of materials to site, shortage of materials on site and lack of site contractors staff (M.S. = 2.44, 2.36 and 2.28) respectively. While the delay in delivery of materials to site tied in both methods (top ranked), coordination problems with others placed 12th as the least in the rank (M.S. = 2.76) and financial problems tied with lack of subcontractor's skills, 11th (M.S. = 1.96) under open and selective tendering methods respectively.

Table 4: T- Test for CRF that trigger budget overruns on TIB projects

	<i>Open Tendering</i>	<i>Selective Tendering</i>
Mean	3.0967	2.1500
Variance	0.0461	0.0233
Observations	12	12
Pooled variance	0.0347	
Hypothesized Mean Difference	0	
Df	22	
t Stat	12.4477	
P(T<=t) one-tail	0.0000	
t Critical one-tail	1.7171	
P(T<=t) two-tail	0.0000	
t Critical two-tail	2.0739	

Based on the contractors' related factors that trigger budget overruns on TIB projects, the following hypothesis was tested:

Null Hypothesis (H_0): there is no significant difference in the contractors' related factors triggering budget overruns on TIB projects using open and selective tendering methods.

Alternate Hypothesis (H_1): there is significant difference in the contractors' related factors triggering budget overruns on TIB projects using open and selective tendering methods.

Decision: Based on the analysis carried out in table 4, T-critical < t-cal (P-value < 0.05), therefore, the null hypothesis is rejected and the alternate hypothesis is accepted. Therefore there is a significant difference, in the contractors' related factors triggering budget overruns on TIB projects, using open and selective tendering methods.

DISCUSSION OF FINDINGS

Table 3 shows the imminent factors, that trigger budget overruns, which are contractors' related in nature on TIB projects. Prominent among which are delay in delivery of materials to site, poor skill and experience of labour inadequate cash flow which is traceable to financial problems. Cost and time overruns have been the characteristic of the construction industry as opined by Aibinu and Jagboro

(2002), Baloi and Price (2003), Garry (2005), Ogunsemi (2002) and Ogunsemi and Aje (2005). However, this study is at variance with the findings of Serdar *et al*, (2017) & Ogunsemi and Jagboro (2006) that fingered inaccurate estimation and wrong cost estimation as factors contributing to cost overrun in construction respectively. At the instance TIB projects procured via open tendering route, delay in delivery of materials to site, poor skills and experience of labour and financial problems are the top three CRF that trigger budget overrun. In the same vein under selective tendering method of procurement, the CRF include the delay in delivery of materials to site, shortage of materials on site and lack of contractors' staff on site among others. Under the two identified competitive tendering methods, there is significant difference in the contractor's related factors in predisposing TIB projects to budget overrun in the study area.

CONCLUSION AND RECOMMENDATIONS

Following the results of data analysis carried out in this study, it was noted that the contractors' related factors that trigger budget overrun on TIB projects is a function of delays in the delivery of materials to site under any of the procurement methods, lack of skilled and experienced labour on site, financial difficulty on the part of the contractor. Others are shortage of materials on site and unavailability of contractor's staff on site. It is also evident from the study undertaken that there existed a significant difference in the contractor's related factors that predispose TIB projects to budget overrun with recourse to both open and selective competitive tendering methods of procurement. Based on the findings from the study, the contractors should be made to provide schedule for ordering materials (both quantity and time) and the list of suppliers so as to avoid delay in the delivery and shortage of materials to site. Experienced labours with adequate skills are to be used, while making readily available other source for financing the projects aside total dependency on monthly valuation to avoid financial difficulty. Lastly, contractor's staff, who can take a binding decision relating to the project, should be detailed on site. Besides TIB projects, other building projects should be looked into in order to ascertain similarity or otherwise as areas for further studies.

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