

Comparative Analysis of Cost Overrun on Road Construction Projects Executed by Indigenous and Expatriate Contractors

Opeoluwa Akinradewo, Douglas Aghimien, Clinton Aigbavboa

SARChI in Sustainable Construction Management and Leadership in the Built Environment,
University of Johannesburg, South Africa.

opeakinradewo@gmail.com

Abstract

Project implementation arguments on expatriate and indigenous contractors in the Nigerian construction industry are based on their performance on construction projects. Expatriate contractors are engaged more on large-scale construction projects leaving the indigenous contractors to small-scale projects. The Nigerian construction industry is not faced with the challenge to draw foreign contractors but to encourage indigenous participation. This study is aimed at determining the cost performance of road projects executed by expatriate and indigenous contractors with a view at drawing a comparison to know how efficient the two groups of contractors are. The study adopted a qualitative research design approach. This is achieved by observing the subject matter in its natural settings and attempting to interpret the pattern and behaviours of the subject matter. With the use of pro-forma, archival data on road project cost executed in Ekiti state between January 2018 and July 2019 were retrieved from the state Ministry of Works. A total of 61 road projects were completed with 28 constructed by indigenous contractors and 33 constructed by expatriate contractors. The retrieved cost data were analysed using descriptive statistics. From the findings of this study, it was evident that road projects executed by indigenous contractors experience less cost overrun compared to road projects executed by expatriate contractors while indigenous contractors execute fewer road projects. It was therefore recommended that indigenous contractors should be patronised by clients in the construction industry to boost the economy and also improve the employment rate by engaging more local manpower.

Keywords

Cost overrun, Expatriate contractors, Indigenous contractors, Nigeria, Road projects

1. INTRODUCTION

The construction industry is faced with the challenge of cutting cost due to the growing need for construction of different types and tight monetary input to the industry. Mendelson & Greenfield (1996) submitted that government, institutions, corporations and other stakeholders of the construction industry will be in a survival race towards the end of the twentieth century due to the poor economic input into the industry. In order to overcome this challenge, participants/stakeholders are on the lookout for methods and processes that enhance the efficient use of construction resources in order to achieve cost and time performance thereby guaranteeing value for money. The cost of construction for a particular project is expected to be a summation of material and labour costs, plant and equipment costs, head office running costs, risk contingency costs, site overheads and profit. Any deviation from the envisaged project details results in an additional cost to the contract sum approved for the project. According to Mbachu & Nkado (2004), these additional costs pose a threat to the construction project thereby resulting in negative implications which affect the industry as well as the key stakeholders. The client, being the owner of the investment incurs less return and loss of revenue; the consultants have their reputation at stake being unable to give the client value for money which results in loss of confidence; the contractor if at fault, records loss of profit and it can also lead to loss of future projects as it reflects on the organisation's profile; end users also get to pay higher lease/rental costs for the property.

Indigenous contracting companies are largely owned and operated solely by Nigerians. Project implementation arguments on expatriate and indigenous contractors in the Nigerian construction industry are based on their performance on construction projects Ibrahim, Daniel, & Ahmad (2014). Most analysis has shown that projects executed by indigenous contractors are associated with poor performance and mismanagement resulting in poor scheduling, weak workforce identification, poor task controls and the general inability to perform under contractual conditions (Makarfi, 2017). Idoro (2004) opined that expatriate contractors are in charge of most construction projects and that in Nigeria the challenge is not to draw foreign contractors but to encourage indigenous participation. This shows that clients in the construction industry hire expatriate contractors more than their local counterparts in the Nigerian construction industry. Idoro (2007) submitted that expatriate contractors earned tremendous support in the colonial government in Nigeria, which led to their establishment even before independence. In contrast to foreign firms which have taken over the market, still major indigenous businesses are still small. Many indigenous contractors have been excluded from major construction schemes because they are mostly small and medium sized. About 5% of the infrastructure and civil engineering projects are executed by indigenous firms and a further 25% of building construction projects. The expatriate contractors are now becoming indigenised and Nigerians have gained from government indigenization initiatives between 40% and 60% capital ownership (Makarfi, 2017).

This study is aimed at determining the cost performance of road projects executed by expatriate and indigenous contractors with a view at drawing a comparison to know how efficient the two groups of contractors are.

2. LITERATURE REVIEW

When there is growth or increase in cost or increase in the budget for a construction project, it is said that there is a cost overrun and vice versa is referred to as cost underrun. However, cost overrun must not be misinterpreted as cost escalation which is an increase in the budget due to inflation. Cost overrun/underrun can be assessed in different forms looking at the base value it is evaluated from. It can be assessed by finding the difference between the preliminary construction estimate and the actual construction cost. It can also be assessed by finding the deviation of the actual construction cost from the contract award value. It is a general view that cost overrun is more experienced in construction projects compared to cost underrun. This has been attributed mostly to underestimation which was presented at the decision-making phase of construction projects and has thus affected proper budgeting for construction projects. It has also been attributed to decision-makers not considering the future value of a project during project viability examination (Odeck, 2004; Love *et al.*, 2013).

Different researches have been conducted to determine the severity of cost overrun/underrun on construction projects across the world. In a study of the US rail transit project carried out by Pickrell (1989) in which eight (8) projects were considered, total capital cost overrun/underrun of 61% was calculated with a range between -10% and +106%. Fouracre, Allport and Thomson (1990) examined fifteen (15) metro systems constructed in developing countries and cost overrun was calculated on eleven (11) of the metro systems with three of these having a cost overrun range between 20% and 50%; two metro systems had cost overrun range between 100% and 500%; six metro systems had cost overrun average above 50%. The remaining four metro systems had cost overrun/underrun range between -10 and +20%. Auditor General Sweden (1994) researched eight (8) road and seven (7) rail projects executed by the Swedish government. A cost overrun/underrun of 86% was calculated with a range between -2% and +182% on road projects while 17% was calculated on rail projects with a range between -14% and +74%. Odeck and Skjeseth (1995) researched on twelve (12) toll projects and cost overrun/underrun of 5% was calculated with a range between -10% and 170%. In a study of 276 construction projects, Skamris Holm and Flyvbjerg (1996) calculated cost overrun in the range between 50% and 100%. Flyvbjerg (2007) calculated a cost overrun/underrun of 20.4% for 167 road projects while Vidalis and Najafi (2002) calculated an average cost overrun/underrun of 10.52% from 708 road projects. In an evaluation of 138 road projects, Le-Hoai, Lee and Lee (2008) calculated cost overrun of 50% for 131 road projects and the remaining 7 projects recorded cost underrun. Ellis *et al.* (2007) examined 3130 road projects in the United States of America and found an average cost overrun/underrun of 9% while Kaliba, Muya and Mumba (2009) evaluated eight (8) road projects in Zambia and calculated an average cost overrun/underrun of 69%. In a study of 157 road project in India by Singh (2009), an average cost overrun/underrun of 15.84% was calculated. Lee, (2008) also evaluated 16 railway projects and calculated 50% cost overrun on all the railway projects. Odeck (2004) evaluated 620 road projects and calculated cost overrun/underrun average of 7.9% with a range between -58.5% and +182.7%. More recently, Love *et al.*, (2015:8) evaluated forty-nine (49) public sector road projects and cost overrun of 13.55% was calculated. It is therefore evident that cost overrun/underrun is a common phenomenon associated with construction projects worldwide.

There are various factors leading to overrun of construction cost for large, medium and small buildings according to different literature on cost performance of construction projects. In a study of the Nigerian construction industry, Omoregie & Radford (2006) and Abdullah, Alaloul, Liew, & Mohammed (2018) sampled the opinions of Contractor, Consultants and Clients and determined 15 factors liable for delays and construction cost overrun in Nigeria. The survey found out price fluctuation as the most excessive reason for experiencing cost overrun. This is attributed to the problem of the exchange rate which in turn influences construction material costs and standard rate level. In another look at Kasimu (2012) and Omoregie & Radford (2006), they recognised 31 vital factors causing high cost of Buildings with an inaccurate estimate and fraudulent practices and kickbacks ranking first and second most important factors respectively in Nigeria. Kasimu (2012) mentioned that fraudulent practices and kickbacks occasioned by means of greed are perpetuated through a few major role players inside the construction industry. Frimpong et al., (2003) evaluated developing countries such as Ghana and identified a few factors as underlying reasons for delays and cost overruns in groundwater construction projects. The five essential factors agreed on by Clients, Consultants and Contractor have been month-to-month stage payment difficulties by clients, poor contract control, material procurement, poor technical performances and escalation of material prices. Several research studies have been carried out to determine the factors causing cost overrun in construction projects outside and within Nigeria. The findings of these researches showed that inaccurate/irrational cost estimation, change in scope/concept, poor site management by contractor, and inadequate site investigation/survey being the major factors responsible for cost overrun in the construction industry (Acharya, Lee, Kim, Lee, & Kim, 2006; Assaf & Al-Hejji, 2006; Azhar, Farooqui, & Ahmed, 2008; Chan & Kumaraswamy, 1997; Choudhry, Aslam, Hinze, & Arain, 2014; D K Chimwaso, 2000; Dissanayaka & Kumaraswamy, 1999; B. Flyvbjerg & COWI, 2004; Ibironke, Oladinrin, Adeniyi, & Eboreime, 2015; Kaliba et al., 2009; Lee, 2008; Mansfield, Ugwu, & Doran, 1994; Nega, 2008; Roachanakanan, 2005).

3. RESEARCH METHODOLOGY

This study adopted a qualitative research design approach. Qualitative research method deals with its subject matter using a naturalistic and interpretive approach. This is achieved by observing the subject matter in its natural settings and attempting to interpret the pattern and behaviours of the subject matter. This study employed the use of pro-forma to retrieve archival data on road projects. Ekiti state in Nigeria was selected as a case study for this study because it was observed that there are various road projects executed in the state and both indigenous and expatriate contractors were involved in these projects. Road project cost data executed in the state between January 2018 and July 2019 were retrieved from the Ministry of Works. A total of 61 road projects were completed with 28 constructed by indigenous contractors and 33 constructed by expatriate contractors. The retrieved cost data were analysed using descriptive statistics. Descriptive statistics examines and analyses sample(s) and derives conclusive statements for the population based on the results of the samples analysed.

4. FINDINGS AND DISCUSSION

The descriptive statistics in Table 1 show the distribution of the archival cost data. From the 61 projects analysed, only 26 projects didn't experience cost overrun while the remaining 35 projects experienced cost overrun. These 35 projects were analysed in categories of the contractors that executed them. The mean values of cost overrun experienced on projects executed by indigenous contractors = 0.65%, expatriate contractors = 14.91% and the overall = 8.37%. The mean determines the average cost by dividing the cost overrun sum by the total count to show that expatriates executed more road projects with cost overrun than indigenous contractors. The standard deviation for indigenous contractors = 2.56%, expatriate contractors = 35.35% and overall = 26.84%. Standard deviation observes the deviation in the cost data obtained from the average cost by calculating the variance of each value which is then squared and totalled before it is divided by the data count. The variance recorded for indigenous contracts = 6.56%, expatriate contractors = 1,249.32% while overall variance = 720.62%. The variance shows the large disparity in the cost of road projects awarded to expatriate and indigenous contractors. Kurtosis measures the amount of probability in the cost data with indigenous contractors = 18.66%, expatriate contractors = 16.39% and the overall = 30.74%. Skewness measures the symmetry in the cost data distribution with indigenous contractors = 4.25%, expatriate contractors = 3.74% and the overall = 5.11%. The interquartile range measures the spread of the cost data from the central values with indigenous contractors = 12.52%, expatriate contractors = 183.23% and the overall = 183.23%. The kurtosis, skewness and range values show the reliability of the data set for the conclusions to be drawn from it.

Table 1. Descriptive Statistics for Cost Performance

Cost overrun	Overall (%)	Indigenous (%)	Expatriates (%)
Mean	8.37	0.65	14.91
Std. Error of Mean	3.44	0.48	6.15
Std. Deviation	26.84	2.56	35.35
Variance	720.62	6.56	1,249.32
Skewness	5.11	4.25	3.74
Kurtosis	30.74	18.66	16.39
Range	183.23	12.52	183.23

Results in Table 2 indicate the distribution of cost overrun based on the project size classified by the cost expended on the projects. The analysis was carried out on all the project cost data retrieved before the projects were grouped under the type of contractors (indigenous and expatriate) that executed them. For the combined analysis, a total of 17 projects fall under the first category of ₦1m-250m with 22.67% cost overrun experienced. This percentage of cost overrun is the highest of the five categories. This was followed by the 12 projects that fell under the >₦1b with a cost overrun of 16.69%. Next in the rank is the 16 projects under the ₦251m-500m with a cost overrun of 10.68%. 9 projects fall under the category of ₦751m-1b with a cost overrun of 1.28% while 7 projects are under the ₦501m-750m project category with 0.94% cost overrun.

Table 2. Cost performance of road projects by project size classification

	Project Size (₦ million)	Project Number	Initial Cost (₦ million)	Final Cost (₦ million)	Cost Overrun (₦ million)	Percentage overrun
Overall	1 - 250	17	2,042.63	2,505.76	463.13	22.67%
	251 - 500	16	6,481.89	7,174.36	692.47	10.68%
	501 - 750	7	4,453.51	4,495.53	42.02	0.94%
	751 - 1,000	9	7,951.64	8,053.64	102.00	1.28%
	>1,000	12	25,747.54	30,045.55	4,298.01	16.69%
	Total	61	46,677.21	52,274.83	5,597.63	11.99%
Indigenous	1 - 250	12	1,280.93	1,280.93	-	-
	251 - 500	5	1,971.40	1,971.40	-	-
	501 - 750	3	2,085.62	2,127.64	42.02	2.01
	751 - 1,000	6	5,241.94	5,343.94	102.00	1.95
	>1,000	2	2,872.50	2,872.50	-	-
	Total	28	13,452.39	13,596.41	144.02	1.07
Expatriate	1 - 250	5	761.70	1,224.83	463.13	60.80
	251 - 500	11	4,510.49	5,202.95	692.47	15.35
	501 - 750	4	2,367.89	2,367.89	-	-
	751 - 1,000	3	2,709.70	2,709.70	-	-
	>1,000	10	22,875.04	27,173.05	4,298.01	18.79
	Total	33	33,224.81	38,678.42	5,453.60	16.41

For road projects executed by indigenous contractors which are 28 in number, the 12 projects under the ₦1m-250m project category, 5 projects under the ₦251m-500m project category and the 2 projects under the >₦1b project category didn't experience cost overrun. Three (3) projects under the ₦501m-750m project category and they experienced cost overrun of 2.01% while 8 projects under the ₦751m-1b project category had a cost overrun of 1.95% cost overrun. For road projects executed by expatriate contractors which are 33 in number, four (4) projects under the ₦501m-750m project category and three (3) projects under the ₦751m-1b project category didn't have a cost overrun. However, five (5) projects under the ₦1m-250m project category had a cost overrun of 60.80%, 10 projects under the >₦1b project category had a cost overrun of 18.79% while 11 projects under the ₦251m-500m project category had a cost overrun of 15.35%.

From the findings of this study, it is evident that road projects executed by indigenous contractors experience less cost overrun compared to road projects executed by expatriate contractors. Surveys have shown that construction clients rather than indigenous contractors choose expatriate contractors (Idoro, 2012). In 1982, the Committee on High Government Contracts in Nigeria observed that while engaging expatriate contractors cost more than indigenous contractors, they are still engaged in more than 90% of Nigeria's overall construction projects (Idoro, 2012). This pattern does not promote indigenous contractor participation, the growth of skills and technological progress and the preventable loss of the limited resources of the country, which is a matter of continuous concern to the construction industry stakeholders (Idoro, 2010). It is believed that there is a low level of participation from indigenous contractors in large-scale construction projects over the years in Nigeria. However, the greater community of construction firms in Nigeria are represented by indigenous companies, though their share of the country's development is lower (Odediran, Adeyinka, Opatunji, & Morakinyo, 2012). This is evident from the data retrieved for this study as 33 of the 61 road projects are executed by expatriate contractors making a total of 54% compared to the 28 projects (46%) executed by indigenous contractors. Also, out of the 12 road projects with project cost over N1b, 10 of them are executed by expatriate contractors. It is worthy of note that these 10 road projects experienced 18.79% average of cost overrun while the two road projects executed by indigenous contractors in the same category did not experience cost overrun. This is in agreement with the submission of (Uduaki, 2006) and (Ibrahim, 2012) who praised the increase in the performance of construction projects executed by indigenous contractors. They further agreed that broad and highly technical projects can still be provided if these indigenous contractors are mobilised and encouraged.

5. CONCLUSION AND RECOMMENDATION

The study has been able to determine the cost performance of road projects executed by expatriate and indigenous contractors. The study retrieved cost data for road projects executed in Ekiti state, Nigeria and it can be concluded that indigenous contractors execute fewer road projects compared to expatriate contractors. Also, indigenous contractors recorded fewer cost overrun on road projects executed compared to expatriate contractors. Despite this, expatriate contractors are patronised more than indigenous contractors by clients in the construction industry. It is therefore recommended that indigenous contractors should be patronised by clients in the construction industry. This will promote local content and also reduce the menace of cost overrun experienced on road projects executed in Ekiti state. Also, expatriate contractors will always send their earnings to their home country which contributes to income generation and distribution shortages, unexperienced indigenous contractors, local construction and material industries that are not worthy. For further study, a wider range of cost data can be retrieved to have a general view of how cost overrun varies on road projects executed by indigenous and expatriate contractors.

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Biographies

AKINRADEWO Opeoluwa Israel is a graduate of Quantity Surveying who bagged his Master's degree from University of Johannesburg, South Africa. He developed an interest in research during his undergraduate days which spurred him into writing articles and reviews. He was chosen to represent Federal University of Technology, Akure, in the ReCon2 Student Essay Writing and Presentation competition organised by the Nigerian Institute of Quantity Surveyors (NIQS) which was contested for by higher institutions across Nigeria and he came first. He was presented a Productivity and Excellence award by the Federal University of Technology, Akure for his contribution to excellence and research in the institution. He is a probationer member of the Nigerian Institute of Quantity Surveyors presently pursuing his Doctorate degree in Construction Management at University of Johannesburg, South Africa. Opeoluwa Akinradewo has published over 15 peer-reviewed articles in journals and conference proceedings.

AGHIMIEN Douglas Omoregie bagged his Bachelor and Master degree from the Department of Quantity Surveying, Federal University of Technology, Akure, Nigeria, and he is currently pursuing a Ph.D. in Engineering Management at the University of Johannesburg, South Africa. During his master's programme, he was employed as a Teaching Assistant in his department, where he assisted in teaching and conducting research. This employment gave the platform for an increased interest in research. He has worked in areas such as construction performance measurement, value management and sustainability in construction. To his name and in collaboration with academia, he has authored a good number of journals and conference papers both locally and internationally. He is a probationer member of the Nigerian Institute of Quantity Surveyors.

AIGBAVBOA Clinton Ohis is currently the Director: Sustainable Human Development and Construction Research Centre, in the Department of Construction Management and Quantity Surveying, School of Civil Engineering and the Built Environment, FEBE. He is Professor in the Department of Construction Management and Quantity Surveying, University of Johannesburg, South Africa. He is a reviewer for various local and international reputable Journals in the built environment. As a Ph.D. candidate in 2013, he was among the top 10 researchers in UJ; while in 2014 and 2015, he was the leading research output contributor in the University. Prof Aigbavboa has published more than 500 peer-reviewed articles in journals, conference proceedings and in book chapters.