Assessment of Factors Affecting Time and Cost Performance of Indigenous and Foreign Contractors in Nigeria

Ayodeji OKE, South Africa; Alexander OMORAKA, Nigeria; Clinton AIGBAVBOA, South Africa; and Toluwanimi OYINLANA, Nigeria

SUMMARY

Cost and time are very important management functions for ensuring that project objectives are fully achieved. Over the years, indigenous contractors in Nigeria are often relegated and rarely awarded large-scale construction projects. This has been partly attributed to the poor management of funds and resources which can result in miserable project execution, bankruptcy, and in a worst-case scenario result to complete project abandonment. This study assessed the factors affecting the cost and time performance of indigenous and foreign contractors on construction projects in South-West, Nigeria. Data were collected via the questionnaire administered to quantity surveying and construction firms. The collected data were analysed using mean item score, percentiles and Mann Whitney. The study revealed changes in design, changes in site conditions and inaccurate quantity take-off as the most critical factors influencing the cost and time performance of indigenous contractors, while poor organization structure, incompetency of professionals and poor construction experience were revealed as the most critical factors influencing the cost and time performance of foreign contractors on construction project. It is thus recommended that firms should give thrifty consideration to these factors as these will enable them to take proper steps in harmonizing the different stages in the construction process which will, in turn, improve their performance.

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1. INTRODUCTION

Cost and time performance are the basic criteria employed in measuring the success of any project. Project control is carried out to ascertain that projects are finished within budget and targeted time frame, and also to ensure other project objectives are achieved. It is a composite task carried out by project managers in practice, and it involves constantly examining plans, assessing progress; and executing corrective actions when required (Olawale & Sun, 2010). Project control is a vital activity in ascertaining the success of construction projects, which are crucial to the national development. This is affirmed by Idoro (2004), who asserted construction as the foundation of development, stating that no country can imagine, visualize and undergo development without an effective and efficient construction industry. The success of construction projects are highly determined by contractors. Hence, the importance of the role of contractors in the construction industry cannot be overstressed; their capability and competence are a function of their output and performance in the construction industry (Yimam, 2011; Odediran, Adeyinka, Opatunji, & Morakinyo, 2012).

Construction contractors involved in the management of construction projects can be designated as entrepreneurs. Their duty in modern construction projects' management involves taking decisions relating to design and management; execution of the facility on site, project closeout/final account reporting, maintenance and rehabilitation of existing facilities (Ibrahim, Daniel, & Ahmad, 2014). Several criteria are employed in categorizing construction contractors in Nigeria, these include size and category of contracts (i.e. small, medium or large); specialization (i.e. engineering or/and building); scope of operation (i.e. local, regional, national or multinational); and the company's owners' nationality (foreign or indigenous). However, the argument on the subject of project performance in the Nigerian construction industry (NCI) centres mainly on the performances of indigenous and foreign contractors (Idoro, 2011; Muazu & Bustani, 2004; Idoro & Akande-Subar, 2008).

A Nigerian Indigenous contractor can be described as an individual or a private establishment constituted in line with the February 1972 Nigeria Enterprises Promotion Decree, whose ownership and capital base is totally Nigerian, and has its base of operation only in Nigeria (Chukwudi & Tobechukwu, 2014). This is similar to the description of Ibrahim, Githae and Stephen (2014), which described Indigenous contractors as contracting organisations which is owned and entirely managed by Nigerians. Therefore, Foreign contractors in Nigeria can be described as contracting firms whose ownership and capital base is exclusively foreign, and its base of operation not only in Nigeria.

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In addition, the nationality of the management and ownership of the firms are exclusively foreigners.

Nigerian Indigenous contractors focus very much on survival due the absence of a distinct policy to ameliorate the sustenance and development of Indigenous construction firms in Nigeria (Ogbu, 2017). And because they have to compete for 5% share of the construction projects (Aniekwu & Audu, 2010), Indigenous contractors are stiffened to formulate and implement practices that will ensure their survival (Ogbu, 2017). One of these practices involves the indigenous contractors often times succumbing to the pressure of bidding to win the contract at any cost in order to get returns on capital/assets employed (Oladimeji & Aina, 2018). Several of these practices are aimed at winning the contract rather than the success of the project (Olatunji, Aje & Makanjuola, 2017). This thus accounts for the reason why the Indigenous contractors fail in preparing adequate project plan which is crucial for good cost and time performance (Inuwa, Wanyona & Diang'a, 2015). Chukwudi and Tobechukwu (2014) asserted that indigenous contractors in Nigeria are often relegated and rarely awarded large-scale construction projects. This has been partly attributed to the poor management of funds and resources which can result in miserable project execution, bankruptcy, and in a worst-case scenario result to complete project abandonment.

Most studies reported that projects handled by NICs are characterised by poor planning, poor workmanship, poor mechanization, poor management capability, cost and time overruns, financial difficulties, high frequency of litigation and project abandonment. These are asserted as the results of inexperience, incompetence, adoption of traditional management methods; and poor innovation and dynamism (Ibrahim, Githae, & Stephen, 2014). This is the reason why in the construction market, foreign construction firms which account for just 5% of the number of contractors in the formal sector controls 95% of the main public projects (Aniekwu & Audu, 2010). This can be explained by the fact that foreign construction firms have a huge capital base and human resources that is well managed to handle their various activities (Tsado, Polycarp & Archibong, 2019). Foreign firms are considered to be technically and managerially superior. They are also viewed as more efficient in funds acquisition and project execution than the indigenous firms who are left with the remaining 5% share of the market (Aniekwu & Audu, 2010; Oladapo, 2006; Odediran, *et al.,* 2012; Muazu & Bustani, 2004).

Numerous problems are confronting the NICs in relation to the provision of an environment that encourages sustainable development. Some of the major problems includes absence of enabling policies of government, lack of patronage by the government, poor technical expertise and unfavorable business conditions (Ikuabe & Oke, 2018). Also, the essential potentials required to handle globalization challenges remains a serious issue to all involved in the Nigerian economy (Idoro, 2004). Stakeholders and clients are constantly criticising the NICs for its poor project performance. The poor performances of NICs have been blamed for the inability of the NGI to deliver services efficiently and effectively. This is thus the reason why it is a common practice to accuse the industry of being wasteful, inefficient, inability to attain

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quantity and quality targets; and also the late delivery of projects. Little wonder why construction projects in Nigeria are more expensive than similar ones in other countries (Nasiru, Kunya, and Abdurrahman, 2012). Therefore, in order to arrest this situation, the factors influencing the cost and time performance of indigenous and foreign contractors in Nigeria was assessed, with a view to identifying the factors exerting the most influence.

2. PROJECT PERFORMANCE

Project success can be described as the attainment of goals dictated by the project plan. Therefore, a successful project can be depicted as a project that has attained its technical performance, sustained its schedule and executed within budgeted cost. In managing a project, the role of the tools and techniques of project management cannot be overemphasized. (Frimpong, Oluwoye, and Crawford, 2003). In project management, time, cost, quality target and participation satisfaction are the major parameters for assessing project success (Ogunsemi and Jagboro, 2006). This is in consonant with Fagbenle *et al.* (2018), which asserts that the success of a project radiates around cost, quality and time, and the needs of clients are generally within these terms. Time overrun can result in cost overrun, which is a global phenomenon (Memon, Rahman and Aziz, 2012). For instance, if there is a variation during the construction of the substructure of a building that results in an increment of the time allotted to it on the project schedule, this can result to the increase of the construction duration from 16 weeks to 18 weeks. Furthermore, the cost of materials such as cement might increase during this additional period, which might result in an increase in the initial contract sum, and this increase might exceed the limit of the contingency sum provided. In addition, the contractor might also request for an additional sum to cover his overhead cost. In this case, time overrun can be said to have resulted in cost overrun.

Time overrun can be defined as failure to complete a project within the targeted time frame or contract schedule. It occurs when execution of each project phase takes more time than allotted in the scheduled of works. It may be caused by the action of one party to the contract or might be a direct outcome of one or more circumstances (Memon, Rahman and Aziz, 2012). According to Omoregie and Radford (2006), the alarming rate of project delay and cost overrun is one of the most pressing concerns in the construction industry of most developing countries. This has inauspiciously affected the provision of infrastructure in countries within sub-Saharan Africa, Nigeria as a point of reference.

Cost overrun is defined by Olujide and Owoshagba (2001) as the difference that exists between the cost limit of a project and its actual cost, and it is a fall out of the actual cost exceeding the cost limit. The cost limit was defined as the highest expenditure a client agrees to be responsible for in relation to a proposed building project, while actual Cost according to Brown (2018), is the total amount spent on a completed project. There are several factors responsible for cost overrun in the construction industry, which if not managed properly could lead to diverse undesirable challenges and outcome. Inadequate management of cost in construction projects leads to a great amount of cost overrun in the construction industry. The impact of this is felt on both the physical and economic

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development of a country. It is thus, essential to complete construction projects within the estimated cost (Memon and Rahman, 2014).

2.1 Observations on project performance

Numerous researchers have adumbrated the subject and factors affecting the cost and time performance of projects in the construction industry worldwide. The factors that influences the cost and time performance of construction projects were denoted by Nguyen and Watanabe (2017) as Critical Success Factors (CSFs). These were grouped into five main categories which includes: factors related to the project (such as project size, project complexity and nature; and the type of project); project management techniques and the external environment (which comprises factors such as level of technology and physical tools; social, political and economic issues) (Nguyen & Watanabe, 2017). According to Omoregie and Radford (2006), projects in Nigeria has a minimum average of 14% cost overrun and a minimum average of 188% time overrun with an average completion work of just 96%. Inuwa, Wanyona, and Diang'a,(2014) observed higher rates of cost and time overruns. It revealed that cost overrun ranges between 35% and 47% and time overrun ranges between 34% and 146% when a traditional procurement system is employed. Furthermore, it reported that when a non-traditional procurement system is employed, cost overrun ranges between 31% and 36% and time overrun ranges between 45% and 60%. Memon, Rahman, and Azis (2012) assessed 8,000 projects and observed that only 16% of the overall number of projects attained the three famous performance criteria of completion of projects within budgeted cost, time and quality standard. Also from a global study on cost overrun issues on transport infrastructure projects which included 258 projects in 20 different countries, Memon et al. (2012) concluded that 9 out of 10 projects face cost overrun. Therefore, cost and time overrun can be asserted as common problems reported globally in the construction industry.

3. METHODOLOGY

The first step involved a review of literature to uncover factors affecting the cost and time performance of indigenous and foreign contractors in the construction industry. This thus aided the design of a questionnaire survey among construction and quantity surveying firms in the Nigerian construction industry. The first section of the questionnaire centred on the background information of the respondents. This is important to assess their qualification in answering the questions asked. Other sections of the questionnaire concentrated on matters relating to the research study.

The study population included 55 construction firms and 30 quantity surveying firms in Ondo State, South-West Nigeria, totalling 85, a sample size of 30 was computed using the sample size formula by Yamane (1967). The sample size consisted of 19 construction firms and 11 quantity surveying firms. Based on this sample size, convenient sampling method was adopted in administering the questionnaires to construction and quantity surveying firms in Ondo state. However, only 29 questionnaires were retrieved from the

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survey. The quality of the responses was considered to be highly reliable for the analysis as the questionnaire were self-administered to firms with a good track record and thus possessed the experiences required in filling the questionnaire. Mean item score and percentile was adopted to rank the factors according to their importance in influencing cost and time performance. In this case, a five-point Likert scale was employed which ranges from 1 (very low) to 5 (very high) and transformed to mean item score for each factor. Independent sample t-test was also employed to test if any difference exists in the effects of factors affecting the cost and time performance of indigenous contractors and foreign contractors in Nigeria.

4. DATA ANALYSIS AND DISCUSSION OF FINDINGS

Data analysis is the process through which the data are interpreted. Meena, Nemade, Pawar, Baghele (2013) described it as the means of bringing out the meaning of the collected data. This section involves the analysis of the collected data. The results of the analysis were based on the responses to the questionnaire on factors affecting cost and time performance of foreign and indigenous contractors. The results are presented in the tables below, which is based on mean item score, percentiles and independent sample t-test.

4.1 Background information of respondents

It is observable from the Table 1 that 51.7% and 48.3% of the respondent work under contracting and consulting firms respectively. 68.9% are specialized in building construction works while 31.1% are specialized in civil engineering works. Furthermore, 20.7%, 24.1%, 34.5% and 17.2% of the respondents are Architects, Quantity Surveyors, Builders and Engineers respectively, while 3.4% are Artisans. In addition, a greater percentage of the respondents had Bachelor's degree. The respondents have an average of 11 years working experience and have handled 23 projects on the average. These reveal that the respondents comprised of the major actors in the construction industry and possess a satisfactory level of experience that is suitable for the study.

Table 1: General Information of the Respondents

Category	Frequency	Percent
Type of organization		
Contracting	15	51.7
Consulting	14	48.3
Total	**29**	**100**
Field of specialization		
Building Construction	20	68.9
Civil Engineering	9	31.1
Total	**29**	**100**
Designation of respondent		
Architect	6	20.7
Quantity Surveyor	7	24.1
Builder	10	34.5

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Engineer	5	17.2
Artisans	1	3.4
Total	**29**	**100**
Academic qualification of respondents		
OND	4	13.8
HND	5	17.2
B.Sc/Btech	13	44.8
M.Sc/Mtech	7	24.1
Total	**29**	**100**
Year of experience of respondent		
0-5	4	13.8
06-Oct	11	37.9
Nov-15	7	24.1
16-20	4	13.8
Above 20	3	10.3
Total	**29**	**100**
Mean	**11**	
Number of projects handled by the respondents		
0-10	5	17.2
Nov-20	6	20.7
21-30	10	34.5
31-40	6	20.7
Above 40	2	6.9
Total	**29**	**100**
Mean	**23**	

4.2 Cost and time performance factors

This research has explored and revealed empirically the factors affecting the cost and time performance of Indigenous and Foreign contractors in South-West Nigeria. The results are presented below.

Table 2: Rating of Factors influencing the Cost and time Performance of Indigenous and Foreign Contractor on Construction Project

FACTORS	Indigenous		Foreign	
	Mean	Rank	Mean	Rank
Changes in design	3.07	1	2.69	12
Changes in site conditions	3.00	2	3.00	8
Inaccurate quantity take-off	3.00	3	3.14	6
Low skilled manpower	2.97	4	3.28	4
Incompetence of professionals	2.93	5	3.38	2
Poor construction experience	2.93	6	3.38	3
Design and management decision	2.83	7	2.38	13
Shortage of materials	2.79	8	2.93	9
Poor innovation	2.76	9	3.14	5
Inaccuracy of material estimate	2.62	10	2.69	11

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Poor organization structure	2.62	11	3.66	1
Evaluation plan	2.34	12	2.75	10
Poor contract management	1.96	13	2.38	7

From the result in Table 2, it revealed that changes in design is the factor having the highest influence on cost and time performance of indigenous contractor on construction projects, this was closely followed by a change in site conditions. Changes in design can be due to an improper design made in the first instance. And according to Sunjka and Jacob (2013), improper design delays project execution as a result of the time expended in reviewing the design, making necessary amendments and getting it certified for construction works. When errors are observed in the design, works are temporarily suspended until such errors are removed. Poor performance due to changes in design might arise due to insufficient time allotted for design due to inadequate planning in line with the requirements of the project. According to Inuwa, Wanyona and Diang'a (2015), in Nigeria, inability to create adequate project plan in line with the contract requirements is one of the reasons why majority of the indigenous contractors are often faulted for poor performance. Changes in design and Changes in site conditions were also identified by Mansfield *et al in* Fagbenle *et al.* (2018) *among the* major factors resulting in cost overrun and delay; which thus influence cost and time performance. Poor organization structure was ranked as the factor having the highest influence on the cost and time performance of foreign contractors, this was closely followed by the incompetence of professionals. The structure of an organisation influences the performance of that organisation. Therefore a poor organization structure will result in several structural deficiencies that will erode efficiency, hamper effectiveness, and retard responsiveness, and these will all affect the delivery of a project negatively (Hutcheon, 2014).

Table 3: T-Test result for the factors affecting cost and time performance of indigenous and foreign contractors

	Levene's Test for Equality of Variances		t-test for Equality of Means						
							Std. Error Diff.	95% Confidence Interval of the Diff.	
	F	Sig.	t	df	Sig. (2tailed)	Mean Diff.		Lower	Upper
Rating Equal variances assumed	1.323	.261	-1.642	24	.114	-.22923	.13963	-.51742	.05896
Equal variances not assumed			-1.642	22.816	.114	-.22923	.13963	-.51822	.05975

From table 3, since the significance level of the Levene's Test for Equality of Variances shown in the third column of the row labelled "equal variance assumed" is greater than 0.05, then it is safe to go ahead with the results displayed on the first line in the output table. This is in accordance with the recommendation of Stephanie (2015). It is also observable from table 3 that the p-value (shown on the sixth column) is greater than 0.05, this implies that there is no significant difference in the effects of this factors on the cost

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and time performance of both Nigerian Indigenous contractors and foreign contractors. This result can be blamed on the premise that both operate within the same social, political and economic environment. And social, political and economic issues are among the "critical success or failure factors" uncovered by Nguyen and Watanabe (2017) that influences the performance of any construction project and invariably the performance of the contractor (either indigenous or foreign).

5. CONCLUSION

The study highlighted that foreign contractors are viewed as more efficient in funds acquisition and project execution than the indigenous firms, which may be due to the fact that NICs are frequently criticized by clients and other stakeholders for poor project performance. The consequences of these poor performances have contributed to the inability of the NCI to deliver services effectively and efficiently. A survey was therefore carried out to identify and compare the factors which have the most influence on the cost and time performance of indigenous and foreign contractors on construction projects in Nigeria. The findings revealed changes in design, changes in site conditions and inaccurate quantity take-off as the major factors influencing the cost and time performance of indigenous contractors. While poor organizational structure, incompetency of professionals and poor construction experience are the major factors influencing cost and time performance of foreign contractors. It is hoped that results of this study will be useful to clients, consultants and contraction firms in ameliorating the successful execution of projects.

The study, therefore, recommends that construction firms should ensure they carry all the concerned professionals along at the design stage, so as to properly and efficiently incorporate the requirements of the client into the design. This will go a long way in mitigating changes in design during the construction phase. In addition, contractors when carrying out estimates should make proper and adequate investigation on what the contract entails, ensuring that all cost items are well captured, with suitable allowances for uncertainties. Construction firms should also ensure an efficient organisational structure is constituted within the firm, as this has been observed to influence the way they execute projects. Furthermore, the client or the consultant acting on behalf of the client should lay emphasis on the competency of professionals and construction experience during contractor selection.

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