



International Journal of Sciences: Basic and Applied Research (IJSBAR)

ISSN 2307-4531
(Print & Online)

<http://gssrr.org/index.php?journal=JournalOfBasicAndApplied>



An Assessment of Major Factors Affecting Construction, Project Cost in Nigeria

Oladipo Francis Olukyode ^{a*}, Fatuki Adeola Mathew ^b, Aluko Adewale Taiwo ^c

^{a,b,c} *Department Of Quantity Surveying, Federal Polytechnic, Ado-Ekiti*

^a *Email: yodedipo@gmail.com*

^b *Email: ademfat15@gmail.com*

^c *Email: alukotaiwo35@yahoo.com*

Abstract

Maintaining steady cost projection on construction projects had been until recently an issue of serious concern, both to the clients and project contractors. Cost deviation from initial cost plan, had been prevalent on construction sites. The factors responsible for this problem can thus not be ruled out. This study therefore assesses the major factors affecting construction project cost with a view to enhancing construction project procurement and delivery. Related literature were reviewed to aids the direction of this study. Data were obtained through the administration of questionnaires to construction professionals. Data obtained from questionnaires were analyzed using percentage distribution table and mean score bar chart. The research established that cost of materials and additional works have the highest relative important index and are the most important factor affecting cost of construction in Nigeria. Likewise fluctuation of prices of materials also has a very significant effect on the cost of construction. It can be observed from the finding that the most effective method of minimizing cost of construction in Nigeria is by ensuring adequate site supervision to minimize poor quality workmanship and idle times, hiring and motivating experienced and qualified workforce to improve productivity allowing sufficient time for feasibility studies and providing comprehensive information required for easier interpretation of drawings and setting out of the works.

* Corresponding author

It concluded by recommending that much focus should be placed on major factors affecting construction in order to reduce the cost of construction cost, enhance construction performance and generate confidence within the construction industry. Also, Quantity Surveyors should become more alive to their responsibilities as cost experts ensuring that they make use of correct estimation methods.

Keywords: Construction project cost; Construction industry; Client, Project contractor.

1. Introduction

Construction industry is very important in the economic development of any nation especially in expanding economy like Nigeria [1]. It controls the capital flow, as well as labour resources, which had cost implications. As a result of this, proper management of these resources is considered an important aspect of project works. Likewise if the resources are adequately harnessed, issues that relate to cost overrun would not arise which could result to variations and claims. Some firms rely on claims as a result of variation incurred during the course of the project execution and afterward evaluate their profit after incurring necessary and unnecessary costs on a project.

This however has tendency of positioning such in a disadvantageous profit position. An effective cost management strategy is therefore necessary; this could be achieved through putting in place a proactive cost management strategy [2, 3].

They described cost management system as a process that should be carried out throughout the lifecycle of a project, from the inception to the final completion and final payment to the contractor. In the light of this, the timeliness and cost effectiveness of various operation and decision carried out will determine to an extent the magnitude of cost that could be saved on the project [4, 3]. The total cost of construction in normal circumstances is expected to be the sum of the following cost: Materials, Labours, Site overheads, Equipment/ Plant, Head office cost and profit but in many parts of the world particularly in Nigeria, there are other costs to be allowed for such as cost as a result of currency exchange, contractor's cartel, disputes on site, insurance cost, fraudulent and kickback [5].

These costs according to the author in reference [6] have obvious negative implications for the key stakeholders in particular, and the industry in general. To the client, high cost implies added costs over and those initially agreed upon at the onset, resulting in less returns on investment. To the end user, the added costs are passed on as high rental/ lease costs or prices. To the consultants, it means inability to deliver value-for-money and could tarnish their reputation and result in loss of confidence reposed in them by clients. To the contractor, it implies loss of profit through penalties for non-completion, and negative word of mouth that could jeopardize his/her chances of winning further jobs, if at fault.

Consequently, the study explored the major factors affecting construction project costs in Nigeria and proffer reasonable steps that can be taken to optimise construction project cost in Nigeria. The paper is expected to extend our understanding on the major factors affecting construction project costs and supply some cost reduction measures for construction project.

2. Review of Related Literature

In developing countries like Nigeria, the construction industry is being considered to play a dominant role in the economic activities of the country. It has an impact that is remarkable on the personal earning, sustaining of employees and the GDP of a country. The Associated General Contractors of America, projected that in 2009 in Maryland an additional of US \$1 billion in non residential construction spending would add about US \$ 2.2 billion to the State's GDP, about US \$ 660 million on personal earnings and create or sustain 17,000 jobs. The analysis on the jobs created was on the basis that 5,800 jobs would be direct construction jobs located within Maryland, 2,700 would be indirect jobs from supplying construction materials and services, and 8,500 jobs would be induced when workers and owners in construction and supplier businesses spend their incomes locally and nationwide [7].

Therefore, improving construction efficiency by means of cost-effectiveness and timeliness would certainly contribute to cost savings for the country as a whole, [8]. According to the researcher [3] in their work titled "Time-Cost modelling for building projects in Nigeria, noted that one of the most serious problems the Nigeria construction industry is faced with, is the problem of cost overrun, with attendant consequence of completing projects at sums higher than the initial sum.

Cost overrun however is not limited to Nigeria, the context is of international concern, this was illustrated in the study carried out by [9] in Australia. It was found out that seven-eighths of building contractors surveyed in the late 1960's were completed after scheduled completing while in Hong Kong 70% of building projects were delayed and completed at cost higher than initial budgeted cost.

Authors in reference [3], Attributed the overrun to wrong cost estimation method adopted at the early stage of the building projects. The study concluded with developing a time-cost model for building projects which is a step ahead of Bromilows models previously in use in determining project duration that would help in avoiding cost overrun.

Authors in reference [10], in their work; delays and cost increases in the construction of private projects presented the causes of cost overrun as composed of three main parts; contractor related problems, material related problems and owners' financial constraint. All of these contributed to the factors affecting construction cost in Nigeria.

Construction cost (Business Dictionary) is the total expense, plus normal overhead and profit that must be paid for the job in question. It is the expense incurred by a contractor for labour, material, equipment, financing, services utilities etc. plus overheads and contractors profit.

2.1 Construction cost factors

There are many factors affecting construction cost for large building projects, and as the building project gets larger and more complex the probability of having so many factors increases [3]. However, this study focus on the major factors affecting construction project cost in construction industry as shown below.

MAJOR FACTORS

REFERENCES

Fluctuation of prices of materials	[11]
Wrong method of estimation	[11]
Cost of materials	[12]
Poor financial control on site	[13]
Contract Management	[14]
Fraudulent practices and kickbacks	[15]
Additional Work	[16]
Design Change	[17]
Supplier manipulation	[18]
Materials fluctuation	[18]
Political interference	[19]
Waste on site	[12]
Plan shape	[17]
Incorrect planning	[17]
Change in the number of storey	[17]

2.2 Ways of optimizing construction project cost in Nigeria

There are several ways in which cost of construction can be optimized. [20], He reveals two cost reduction measures. The first is the application of a value engineering concept, which aims at a careful analysis of each function and the elimination or modification of anything that add to the project cost without adding to its functional capabilities. According to him, the items to be considered carefully in bringing an improvement in the overall cost of project are:

- Investigating costs
- Planning and Organizing
- Cost benefit values
- Similar cost influencing items

The second is to provide comprehensive and error free designs and specification to avoid mis- interpretation by the contractor or delay due to missing details.

According to reference [21], recommendation, cost reduction measures can be introduced by elimination or minimization of design specification, delivery and site wastes through the formation and implementation of effective material policy and material management.

In addition authors in reference [22], observed that profitable firms may be generating their revenues from the elimination of waste at both professional and trade practice levels. Cost reduction measures also include:

- Establishing firmly the requirements and features of the project at the onset before getting started
- Preparing the project team to do its best by getting members to sign off on capabilities and responsibilities
- Staying diligent about keeping the project on the right path through contract clauses that disallow significant changes once the project is underway
- Effective human resource management through effective motivation
- Project tracking involving discerning early what area or paths are leading to dead ends and applying early corrective measures.

In summary, high construction costs have obvious negative implications for the major actors in particular, and the industry in general. Project abandonment, drop in building activities, bad reputation and inability to secure project finance are all implications of high construction cost. However, an application of the proffered solutions would restore clients' confidence in consultants, reduce investment risks and generally boost the viability and sustainability of the industry.

3. Research Methodology

With the review of existing literature on previous studies relating to the subject matter, it is intended to fashion out in this chapter an appropriate methodology for the study, which can achieve the specific objectives of the research. The issues like target population, research design, sampling technique and sample size, data collection, procedure and method of data analysis were discussed.

3.1 Research Design

A descriptive survey was employed

3.2 Target Population

The target population examined is the professionals in the construction industry. For effective coverage, a good number of questionnaires were distributed to client, Architects, Engineers, Quantity Surveyors, Contractors and other relevant professionals in construction industry. The study areas were limited to Ekiti and Ondo State of Nigeria.

3.3 Sample Size

A total of 60 out of 80 questionnaires administered were returned and they were all suitable for analysis.

3.4 Data Collection Instrument

Two sets of data were identified as being relevant to the effective conduct of this research namely primary and secondary. The primary data which refers to field data were obtained through the use of well structured questionnaire developed from the initial identification of likely factors affecting construction cost in Nigeria and solutions to minimizing same.

Secondary data through the review of various relevant literatures were also used in the course of carrying out the research.

3.5 Method of data collection

The survey method adopted for effective collection of relevant data necessary for examine the factor affecting the construction project cost in Nigeria was questionnaire.

3.6 Analytical Techniques

In analyzing the responses from the respondents, the data collected were represented in frequencies tables and percentages in order to give true picture of the information generated in the survey.

Table 1, showed the percentage of the number of questionnaire received from respondent, 10 percent was received from the clients, 26.67 percent from Quantity Surveyors, 20 percent from Architects, 33.33 percent from the Contractors and 10 percent from other qualification.

Out of 60 respondents that were used for the study, it was observed that, 33.33 percent respondents are HND graduate, 26.67 percent are B.Sc holder, 30 percent are M.Sc holder, 3.33 percent are Ph.D and 6.67 percent had other qualification. The table also show that 2 of the respondents fell between 0.5 years of experience, 15 fell between 6-10 years of experience, 16 also fell between 11-15 years of experience, 21 of the respondents fell between 16-20 years of experiences and 6 of the respondents fell in 21 and above years of experiences. These show that the experiences of the respondents are adequate in responding to the questions. With the number of project handled by the respondent as shown in the table, the respondents are adequately suitable to supply information required for the study. The table 2, below categorized the factors affecting construction project cost under each sector. Under financial factors, the relative important index (RII) fell within 0.940 for cost of materials and 0.765 for inflation. The three most significant factors are cost of materials, fluctuation of prices of materials and wrong method of estimation. However, cost of material is the most significant financial factors with RII of 0.940. The ranking of respondents' opinions of the factors related to construction parties that affect construction project cost are shown in the table. For the 7 factors offered to respondents, the relative important index rating values range from 0.915 for contract management and down to 0.720 for contractor's cartel.

It would be seen from this that majority of the factors identified are critical factors affecting construction cost. However, the most critical ones are contract management, poor financial control on site and fraudulent practices and kickbacks.

The table also illustrated the respondents rating of the factors related to construction items that affect construction project cost. It fell between 0.940 for additional work and 0.795 for duration of contract period. The factors identified are all critical but the most critical one is additional work. The respondents rating of the environmental factors that affect construction project cost are also shown on the table. It fell between 0.885 for material fluctuation and 0.675 for law and regulation. The most critical factors affecting the cost is material fluctuation. Under the political factors that affect construction project cost. The most significant factor here is political interference with RII of 0.775. Incorrect planning is the most significant factor in construction factors that affect construction project cost with RII of 0.870 and dispute on site ranked lowest with 4th position.

Table 1: Presentation of broad data section of the questionnaire

s/n	Items	Frequency	Percentage (%)	Cum. Percentage (%)
1	Type of respondent (60)			
i.	Client	6	10.00	10.00
ii.	QS	16	26.67	36.67
iii.	Architect	12	20.00	56.67
iv.	Contractor	20	33.33	90.00
v	Others	6	10.00	100
2	Qualification of respondents (60)			
i.	HND	20	33.33	33.33
ii.	B.Sc	16	26.67	60.00
iii.	M.Sc	18	30.00	90.00
iv.	Ph.D	2	3.33	93.33
v.	Others	4	6.67	100
3	Respondent's Year of Experience (60)			
i.	0 – 5	2	3.33	3.33
ii.	6 – 10	15	25.00	28.33
iii.	11 – 15	16	26.67	55.00
iv.	16 – 20	21	35.00	90.00
v.	21 and above	6	10.00	100
4	Number of Projects Handled (60)			
i.	0 – 5	1	1.67	1.67
ii.	6 – 10	3	5.00	6.67
iii.	11 – 15	16	26.67	33.34
iv.	16 – 20	18	30.00	63.34
v.	21 and above	22	36.66	100

Table 2: The major factors affecting construction project cost

FINANCIAL FACTORS	RII	RANKING
Fluctuation of prices of materials	0.890	2 nd
Wrong method of estimation	0.840	3 rd
Cost of materials	0.940	1 st
Poor financial control on site	0.850	2 nd
Contract Management	0.915	1 st
Fraudulent practices and kickbacks	0.805	3 rd
Additional Work	0.940	1 st
Design Change	0.825	2 nd

Table 3: How to optimize construction project cost

ITEMS	RII	RANKING
Investigation cost	0.875	1 st
Planning and organizing	0.800	2 nd
Cost benefit values	0.785	3 rd
Similar cost influencing items	0.700	4 th

Source: Field survey, (2015)

Table 3, Illustrated the respondents rating of how to optimize construction project cost. It fell between 0.875 (investigating cost) and 0.700 (similar cost influencing items). All the factors identified are critical except similar cost influencing items.

Table 4 reveals a general view of all the three parties on the most effective ways of reducing cost of construction. The three most effective measures of minimizing construction cost are;

- Staying diligent about keeping the project on the right path through contract clauses that disallow significant changes once the project is underway
- Effective human resources management through effective innovation.

- Establishing firmly the requirements and features of eth project at the onset before getting started.

Table 4: Cost reduction measures

ITEMS	RII	RANKING
Establishing firmly the requirements and features of the project at the onset before getting started	0.840	3 rd
Preparing the project team to do its best by getting member to sign off on capabilities and responsibilities	0.720	5 th
Staying diligent about keeping the project on the right path through contract clauses that disallow significant changes once the project is underway	0.890	1 st
Effective human resources management through effective motivation.	0.866	2 nd
Project tracking involving discerning early what area or paths are leading to deed ends and applying early corrective measures.	0.800	4 th

4. Discussion and Finding

By comparing all the construction cost factors examined in this study, cost of materials and additional works have the highest relative important index and are the most important factor affecting cost of construction in Nigeria. This is in consonance with the findings of [23] about the factors contributing to construction cost in Saudi Arabia. Fluctuation of prices of materials also has a very significant effect on the cost of construction. It was ranked second under the major factors. [11], he came to the same conclusion after they studied the factors responsible for project delays and construction cost escalation in Nigeria.

Poor contract management will affect cost of construction. This could be attributed to the manner in which contracts are awarded. Kangari in [24] calls it management incompetence. It was ranked 1st under factors related to construction parties with the relative important index of 0.915.

The most effective method of minimizing cost of construction in Nigeria as perceived by the three parties is ensuring adequate site supervision to minimize poor quality workmanship and idle times, hiring and motivating experienced and qualified workforce to improve productivity and quality of workmanship, allowing sufficient time for feasibility studies, design planning and tender submission, minimizing conflicts with subcontractors, which could undermine onsite productivity and progress of work, providing comprehensive information required for easier interpretation of drawings and setting out of the works. This is similar to recommendation of Ashwoth [24] where he observed that profitable firms may be generating their revenues from the elimination of waste at both professional and trade practice levels. The cost of reduction measures including; establishing firmly the requirements and features of the project at the onset before getting started, preparing the project team to do its best by getting members to sign off on capabilities and responsibilities, staying diligent about keeping the project on the right path through contract clauses that disallow significant changes.

Once the project is underway, effective human resources management through effective motivation, and project tracking involving discerning early what area or paths are leading to dead ends and applying early corrective actions.

5. Conclusion and Recommendation

Conclusively, the main factor affecting cost of construction as opined by the three key players in the construction industry is cost of materials. Since Quantity Surveyors are cost experts they are in the unique position to examine these factors and take care in estimate and mitigate the adverse effects of these factors on the project cost.

Clients, Contractors and Consultants should give an economic approach to construction work such that they would be able to identify the dominating factors leading to high cost of construction in Nigeria and apply the proffered solutions to minimizing same so as to restore client's confidence in consultants, reduce investment risks, and generally boost the viability and sustainability of the industry.

The following recommendations are deduced from this study:

- Much focus should be placed on major factors affecting construction cost in order to reduce the cost of construction cost, enhance construction performance and generate confidence within the construction industry.
- Quantity Surveyors should become more alive to their responsibilities as cost experts ensuring that they make use of correct estimation methods.
- There should be thorough crosschecking of estimates based on updated price information in order to avoid any wrong estimation.
- Clients should clearly identify their requirements and needs, whether they are able to achieve them with their financial capability in order to reduce payment problems.
- There should be proper coordination and communication among various parties working on the project in order to improve management, control problems and reduce any avoidable delay.

References

- [1] Ibrinke, O. T. (2003) *Construction Finance*. Birnin Kebbi. Timlab Quanticost.
- [2] Love, P. E. D; Tse, R. Y. C and Edwards, D. J (2005) Time-cost relationship in Australian Building construction projects. *Nigeria journal of construction and management*, 2 (1) 81-86
- [3] Ogunsemi D.R. and Jagboro G.O. (2006) Time-Cost Model for Building Projects in Nigeria. *Journal of Construction Management and Economics*. 24, 253-258.
- [4] Kerzner, H. C. (2005) *Project management*. Sixth Edition. John Wiley and Sons. Incorporated Canada. Patrick Achitabwino (2009) Articles on Construction Industry and National Development.
- [5] Neil, J. M. [1983] *Construction cost estimating for project control*. Upper saddle river NJ. Prentice Hall.

- [6] Mbachu J. I. C. and R. N. Nkado, (2004) Reducing building construction costs; the views of Consultants and Contractors. COBRA.
- [7] Patrick Achitabwino (2009) Articles on Construction Industry and National Development.
- [8] Peter F.K. (1997) *Construction Management and Economics* 15, 83-94. TELL (2002) The Rot that was PTF *Tell magazine* Number 43, Special Report. TELL communications limited.
- [9] Chan, D. and Kumanaswamy, M. (2006) Compressing Construction Duration: Issues Learned from Hong Kong Building Projects. *International Journal of Construction Management*, 20(1), 23-35
- [10] Koushki, P.A. Al-Rashid, K and Karton, N., (2005) Delay and Cost Increases in the Construction of Private Residential Projects in Kuwait, *Journal of Construction Management and Economics*, 23 (3) 285-294
- [11] Omoregie, A. and Radford D. (2006) Infrastructure Delay and Cost Escalations; Causes and Effects in Nigeria. *School of Architecture*. De Montford University England
- [12] Elinwa, U. ,and Buba, S., [1993] Construction cost factors in Nigeria. *Journal of construction Engineering and Management*. 119, [4] 698-714.
- [13] Ogunlana, S., Krit, P. and Vithool, J. (1996) Construction Delays in a Fast Growing Economy: Comparing Thailand with other Economies. *International Journal of Project Management*. 14(1) 37 45.
- [14] Frimpong, Y., Oluwole, J. and Crawford, L. (2003) Causes of Delays and Cost Overruns in Construction of Ground Water Projects in Developing Countries; Ghana as a case study.*International Journal of Project Management* 21, 321-326.
- [15] TELL (2002) The Rot that was PTF. *Tell magazine* Number 43, Special Report. TELL communications limited.
- [16] Manfield, N. R., Ugwu, O.O. and Doran, T. (1994) Causes of Delay and Cost Overruns in Nigeria Construction Projects, *International Journal of Project Management* 12(4) 254 – 260.
- [17] Asamoah, J. (2002) Satisfying the Energy Hunger in West Africa; A Progress on West Africa Gas Pipeline.*African Energy*.Brooke Patrick Publications. Johannesburg, <http://www.africanenergy.co.za>
- [18] Manavazhi, M. R. and Adhikari D. K. [200] Material and equipment procurement delays in highway project Nepal. *International Journal of project management* 20, 627-632
- [19] Omole A. O. (1986) Causes of the High Cost of Building and Civil Engineering Construction in Nigeria.*The Nigerian Quantity Surveyor*, (6) 1-2.
- [20] Fisk, E. R. (1997) *Construction Project Administration*, 5th Edition, Prentice Hall: New Jersey.
- [21] Williams P. and Cooke, B. [2003] *Construction planning, programming and control* 2nd edition. Palgrave, New York.
- [22] Ashworth, A. and Hogg, K. [2002] *Added value in design and construction*. Pearson
- [23] Abdulaziz, A. and AL-juwairah, A. [2002] Factors contributing to construction costs in saudia Arabia, *Cost Engineering Morgatown*; vol. 44,may.
- [24] Kangari, K. (1989) Business Failure in Industry. *Journal of Construction Engineering and Management*, 115(2) 173-187.