

Revisiting Causative Factors of Project Cost Overrun in Building Construction Projects in Nigeria

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Abstract. The growing need for construction of all types coupled with a tight monetary supply has provided the construction industry with a big challenge to cut cost. The total cost of construction in normal circumstances is expected to be the sum of materials, labour, site overheads, eEquipment/plant, head office cost and profit but in many parts of the world particularly in Nigeria, there are other costs to be allowed for. To the end user, the added costs are passed on as higher rental/ lease costs or prices. The aim of this study is to appraise the causative factors of cost overrun on building construction project in the Nigerian construction industry. This study was carried out using quantitative research method. This involved the collection of data relating to the research study through questionnaires prepared using literature search and carried out among professionals in the construction industry such as Architects, Builders, Engineers, Project Managers and Quantity Surveyors. Random sampling technique was employed in selecting the 156 respondents for the research study within the South Western region of Nigeria. Data retrieved were analysed using Percentile, Mean item Score and Kruskal-Wallis H-test. Findings revealed that additional cost (e.g. variations), poor financial control on site, contract management, previous experience of contractor, wrong estimation method are the major factors leading to cost overrun on building construction projects. The study concluded that construction projects experience cost overrun as a result of negligence in one way or the other by all the stakeholders involved in the construction process from inception to final completion.

Keywords: Building Construction; Cost Overrun; Construction Industry; Nigeria

1. Introduction

The increasing necessity for construction projects of all types combined with a little funding from government has resulted in the construction industry having challenges of cutting cost. The primary goal of every investor is achieving the planned project within the stipulated cost budget and time. The construction industry has been reported to be one of the most fragmented, complex, time and material-driven industry. The industry is always faced with challenges such as low quality, low productivity, delay, cost overrun, etc [1]. For the construction industry, cost overrun is a global phenomenon, and its effects always cause a rift between project management consultants, owners, and contractors [2]. With continuous growth in size experienced by the construction industry, planning and budgeting challenges increased also. This is a result of delays on construction projects as it is not uncommon for



construction projects to exceed the set time [3]. Research studies have shown that there are more cases of cost overrun compared to time overrun on construction projects which, therefore, makes the issue of cost overrun a subject of concern [1]. When a construction project cost gets out of the project team's control, it creates pressure for the investor/owner, affects future investment decision-making, results in losses, and wastes resources [4]. Identification of leading factors is usually the first step to take when addressing a challenge, after which corrective actions can be embarked upon [1]. According to Swei [5], cost is one of the prime factors considered when evaluating construction project success. This is as a result of the fact that cost is the backbone and driving force of the project throughout the construction phase. Flyvbjerg [6] and [7] further opined that a completed project may not be referred to as successful unless it is proven to be executed within the cost budget set for it except there is a change in scope. This was corroborated by Sambasivan [2] that cost will always be given importance construction industry stakeholders. Hence, to measure construction project cost performance, the final cost is compared to the budgeted cost [1]. It is therefore imperative to identify the causative factors that cause cost overrun on construction projects in a bid to ameliorate the cost overrun. Some research work has been carried out on the causes of cost overrun in the Nigerian construction industry but most of them only took a cursory approach to selecting the different factors [8,9]. This study contributes to the body of knowledge by taking an in-depth approach to evaluating the factors causing cost overrun in the Nigerian construction industry. This is achieved by carrying out extensive literature review of identified factors from other developing countries.

2. Related Works

With cost overrun being a major challenge facing construction projects, many scholars researched its causes and it was revealed that it can be as a result of different factors which vary from each construction industry to the other as shown in Table 1. Some of these factors cause delay in construction projects which eventually lead to cost overrun.

Table 1. Identified Factors Causing Cost Overrun on Construction Projects from Literatures

Factors	Author(s)
Absence of construction cost data	[7,10]
Additional work	[7,11,12]
Bureaucracy in the tendering method	[7,12]
Duration of contract period	[12,13]
Contractors' cartel	[14,15]
Contractual procedures	[7,10]
Material Cost	[7,12]
Disputes on site	[13,15]
Contract management	[11,16]
Stability of economy	[7,17]
Cost of Insurance	[10,12]
Fraudulent practices and kickbacks	[7,18]
Changes to design	[7,12,19]
Government policies	[12,14]
Labour high cost	[7,12]
Currency exchange	[7,10]
Machinery high cost	[7,20,21]
Labour availability	[7,10]
Machinery maintenance high cost	[10,15]
Transportation high cost	[7,21]
High-interest rates by banks	[10,12]
Poor Planning	[7,15]
Prices of materials fluctuation	[14,17,21]

Table 1. Identified Factors Causing Cost Overrun on Construction Projects from Literatures

Factors	Author(s)
Nationality of Labourers	[10,12]
Absence of synergy among designers and Contractor	[7,10,12]
Unavailability of standard for productivity	[10,12]
Class of competitors	[7,10,12]
Delay between the design period and bidding	[7,14]

3. Research Methodology

This research work was carried out using quantitative research method. This involves thorough review of existing literature to extract the factors causing cost overrun on construction projects from different developing countries' construction industry. The choice of developing countries was because Nigeria is also a developing country which have similar characteristic as the other developing countries. The questionnaire was designed to retrieve respondents' demographic information useful for the research study and their opinion on the causative factors of cost overrun in building construction projects ranked on a five-point Likert Scale. The target population for this study were the various professionals serving as consultants on a construction project and responsible for the planning and supervision of construction projects in South-Western, Nigeria. These professionals include Architects, Builders, Engineers, Project Managers, and Quantity Surveyors. Project managers were identified using snowball sampling technique i.e. one project manager was identified and referral to other colleagues were gotten while random sampling technique was employed in the administration of questionnaires to other respondents. Google form was used in sending out questionnaires to construction professionals within the study area via their respective professional bodies. The questionnaire was made open for a period of 120days to allow for adequate response from the professionals. 156 questionnaires were retrieved after the expiry of 120 days and they were found suitable for analysis. Percentile, Mean Item Score and Kruskal-Wallis H-test were used in analysing the retrieved data.

4. Findings and Discussions

Demographic information of the respondents revealed that 36.5% of the respondents are affiliated to NIQS, 22.4% are affiliated to NSE while 14.1% are affiliated to NIA and PMI each. Only 12.9% of the respondents are affiliated to NIOB. Analysing the number of projects respondents have been involved in within the last 10 years, showed that 11-15 projects have been managed by 49.4% of the respondents while 29.4% and 4.7% of the respondents have managed 6-10 and 1-5 projects within the last 10 years respectively. Respondents who have managed above 15 projects are 16.5%. It was also revealed that 51.8% of the respondents have 11-15 years of experience in the construction industry, 34.1% has 6-10years of experience and 14.1% has experience of 16 years and above. None of the professionals has less than 6years of experience. From the demographic information of respondents, it is evident that the respondents possess adequate professional qualifications and with their wealth of experience, there is confidence in their response in evaluating the perceived consultants' mitigating measures for project cost overrun.

Table 2. Respondent's Ranking of Causative Factors for Cost Overrun on Construction Projects

Factors	Mean	Rank	Chi-square Value	Kruskal-Wallis sig. p
Additional cost (e.g. Variations)	4.39	1	2.370	0.499
Poor financial control on site	4.39	1	4.724	0.193
Contract management	4.31	3	1.589	0.662
Previous experience of contractor	4.31	3	3.392	0.335
Wrong method of estimation	4.24	5	7.584	0.055
Lack of synergy among designers and contractors	3.85	6	3.253	0.354
Absence of construction cost data	3.74	7	5.042	0.169

Table 2. Respondent's Ranking of Causative Factors for Cost Overrun on Construction Projects

Factors	Mean	Rank	Chi-square Value	Kruskal-Wallis sig. p
Cost of materials	3.67	8	4.724	0.193
Delay between design period and bidding	3.56	9	1.589	0.662
Disputes on site	3.49	10	3.392	0.335
Project financing	3.49	10	7.584	0.055
Incorrect planning	3.49	10	0.405	0.939
Political interferences	3.49	10	1.352	0.717
Fraudulent practices and kickbacks	3.48	14	1.477	0.688
Bureaucracy in tendering method	3.47	15	1.603	0.659
Relationship between management and labour	3.45	16	2.842	0.417
Cost of Insurance	3.45	16	3.632	0.304
Economic instability	3.42	18	0.671	0.880
Inadequate site investigation/survey	3.42	18	2.110	0.550
Number of construction projects executed consecutively	3.35	20	0.920	0.821
Government policies	3.32	21	0.252	0.969
Bond financing and payment modes	3.28	22	1.693	0.638
Inadequate labour	3.28	22	1.814	0.612
Contractual procedures	3.24	24	0.999	0.801
Frequent design changes	3.22	25	1.908	0.592
Labour high cost	3.21	26	0.858	0.836
Machinery high cost	3.20	27	2.220	0.528
Inadequacy of raw material production	3.16	28	0.057	0.996
Banks charging High interest rate	3.15	29	1.874	0.599
Currency exchange	3.15	29	2.273	0.518
Social and cultural impacts	3.13	31	1.473	0.689
Lack of productivity standard	3.12	32	2.554	0.466
Cost of transportation	3.04	33	0.231	0.972
Duration of contract	3.04	33	1.394	0.707
Supplier manipulation	3.00	35	1.683	0.641

From Table 2, the Kruskal-Wallis statistic to test whether or not the responses to the causative factors leading to project cost overrun are similar enough to conclude that they are statistically the same. The asymptotic value (p) must be less than 0.05 to determine if there's a significant difference in the responses. The result shows that there exists no statistically significant difference among the group of respondents as all the asymptotic values are above 0.05. This means that all the respondents have the same idea towards the identified factors leading to project cost overrun. From the ranking, additional cost (e.g. variations) and poor financial control on site both ranked first with an MIS of 4.39 while contract management and previous experience of contractor both ranked third with MIS of 4.31. Wrong estimation method was ranked fifth with MIS of 4.24 while lack of coordination between designers and contractors, absence of construction cost data, and cost of materials ranked sixth, seventh and eighth with MIS of 3.85, 3.74 and 3.67 respectively. The least ranked three factors are cost of transportation, duration of contract, and supplier manipulation with MIS of 3.04, 3.04 and 3.00 respectively. From the result, it was observed that all the factors have MIS above 3.00 which is the average of the five-point Likert Scale used. This indicates that all the factors contribute largely to cost overrun on construction projects within the study area – Lagos, Nigeria.

The findings, therefore, indicated that cost overrun is a common phenomenon in the construction industry induced by varieties of factors such as the introduction of new works during the construction phase of the project, poor practice of cost control techniques, improper management of the contract

among others. These factors can either be client-related, project team-related, contractor-related, economic-related, political-related or manpower-related. are in agreement with the research work carried out by [15] who identified 61 factors and categorised them using exploratory factor analysis 12 sub-headings which are owner/consultant, environmental, political, economic, related to bidding, related to construction, related to project, related to contractor, related to design, related to resources, technical/managerial, and legal factors. The findings are also in tandem with the research works of [7,12,17,20,21] as all these factors are also the causes of cost overrun in the construction industries of the different countries, they considered for their research works.

5. Conclusion and Recommendation

Findings of this study has revealed that cost overrun in the Nigerian construction industry is caused by different factors related to owner/consultant, environmental, political, economic, related to bidding, related to construction, related to project, related to contractor, related to design, related to resources, technical/managerial, and legal factors. All these factors contribute majorly to the cost overrun on construction projects as respondents ranked them higher above the average score. It can be concluded that construction projects experience cost overrun as a result of negligence in one way or the other by all the stakeholders involved in the construction process from inception to final completion. This study, therefore, recommends that construction project professionals/stakeholders should embrace economic consideration in the execution of construction projects in order to identify the prevailing factors causing cost overrun on building construction projects. The major limitation to this study is that it was carried out in the South-W region of Nigeria only and therefore, cannot be generalised for the whole Nigerian construction industry. Further study can be carried out on the measures to ameliorate cost overrun on construction projects in the Nigerian construction industry.

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