

Cost Overruns on Federal Capital Territory Authority Road Construction Projects

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Abstract

The pervasiveness of cost overruns on construction projects has been an issue of great concern. Many studies have been carried out worldwide to address the problem. However, there is dearth of literature on Nigerian road construction projects cost overruns. This study focused on determining the extent of cost overruns on Federal Capital Territory Authority (FCTA) road construction projects and identifying the most significant of the causes. The study used questionnaire survey, interviews and examination of road construction documents to obtain data. Measure of discrepancy, relative index and thematic analysis were used for the data analysis. The study revealed different causes of cost overruns for the different methods employed. Analysis of the questionnaire survey data showed that inflation, fluctuation of prices, exchange rate, government related issues like changes in policies, and variation were the 5 most significant causes of road construction projects' cost overruns. Examination of construction documents however showed that delays in payment, design changes, and unforeseen ground conditions were the main contributory causes. Yet, interview responses indicated that cost overruns on road construction projects occur due to many diverse reasons. It was therefore concluded that different road projects have different challenges and experience different magnitude of cost overruns that result from various reasons. Therefore, findings on one road are not always applicable to other roads.

Keywords: Cost Overruns, Management, Nigeria, Road Construction Projects, PLS-SEM

INTRODUCTION

Construction industry is one of the most significant industries that contribute toward socio-economic growth especially to developing countries (Hussin, Abdul Rahman, & Memon, 2013) and the Nigerian construction industry is not an exception to this. According to Isa, Jimoh and Achuen (2013), the construction industry contributes about 3% to Nigeria's Gross Domestic Product (GDP). Construction creates, builds and maintains the workplaces in which businesses operate and flourish, the homes in which people live and the schools, hospitals which provide the crucial services that society needs and the important economic infrastructure like roads which keeps the nation connected (Department of Business Innovation and Skills, 2013).

Road is the primary mode of transportation in Nigeria and durable road infrastructure is essential to economic growth and social development (Olamigoke and Emmanuel, 2013). Roads account for over 90% of all inter and intra city movements of persons, goods, farm produce, merchandise, animals and mobile services. The proper development of road transport network not only reduces the cost of transportation both in terms of money and time but also helps in the integration of various regions within the country and better understanding of neighbouring countries at the international level (Aldagheiri, 2009). Canning and Pedroni (1999) found strong evidence of causality between kilometres of paved roads and GDP among a significant number of the countries investigated. The predominance of road transport as a

means of passenger and freight movement in Sub-Saharan Africa underlies the economic importance of road (Brushett, 2005).

Road development is a large-scale endeavour, which involves multiple parties, time, planning and administration; and requires significant amount of capital, which necessitates government involvement in financing, constructing and maintenance. Nigeria spends about N143M on every 1Km of road constructed and according to The African Road Evaluation (2013), Nigerian roads have the highest cost overruns in the world). Alexeeva, Padam and Queiroz (2008) stated that the average cost overrun of road projects in Nigeria was 39.7%. Cost overruns are a great setback for Nigeria as roads are already being procured at very high costs.

A vast number of comprehensive researches have been conducted worldwide to explain why and how construction projects exceed their estimated costs (Love, Edwards & Irani, 2012; and Love, Sing, Carey, & Kim, 2014) but most of the studies carried out concentrated on building construction and transport infrastructure in general. Although road construction cost overruns contribute to significant financial risks, in most of the studies, road construction cost overruns, especially in Nigeria are under studied. This study therefore, examined the extent of cost overruns and identified the most significant cost overruns causes on Federal Capital Territory Administration road construction projects with a view to minimise them.

Cost Overruns

Cost overruns in projects are one of the most critical issues during the execution of construction projects. Unfortunately, government policy makers and planners do not seem to learn from past mistakes as the magnitude of cost overruns has not improved over the last several decades (Flyvbjerg, Holm & Buhl, 2003). Mahamid and Bruland (2011) conceded that researches on construction projects in some developing countries indicate that by the time a project is completed, the actual cost exceeds the original contract price by about 30%. These overruns vary in frequency and magnitude for different projects.

Al-Zarooni and Abdou (2000) found that the variations (positive or negative) in UAE public projects' estimates between feasibility and contract cost ranged between -28.5% and +36%. Based on project data across 20 nations, Flyvbjerg *et al.* (2003) concluded that 9 of 10 projects faced cost overrun in the range of 50 to 100% and that the average cost overrun for rail was 45%, it was 34% for fixed links (tunnels and bridges) and 20% for roads. Flyvbjerg *et al.* (2003) also established the average cost deviation for all project types as 28%.

Bustani (2004) in an appraisal of the tender evaluation practice in the public sector found that construction project in Nigeria are procured at prices much higher than the cost at which they were initially evaluated. An investigation of the statistical relationship between actual and estimated costs of road construction in Norway by Odeck (2004) revealed mean cost overrun of 7.9% ranging from -59% to +183%. Jagboro (2005) cited in Ubani, Okorocho, and Emeribe (2015) found that cost overruns occur more frequently and are more severe problem than time overruns on building projects in Nigeria. Omoregie and Radford (2006) reported that the minimum average percentage of project cost escalation in Nigeria was 14%. However, Binchak (2008) discovered cost overrun of 41.7% on the provision of infrastructure projects in Abuja, Nigeria. Similar to Omoregie and Radford (2006) findings, a survey of construction cost performance in Brazil by Franca and Haddad (2018) revealed that 71% of 231 contracts exceeded their budget by 14%.

Causes of Cost Overrun on Construction Projects

Numerous scholars have carried out a plethora of studies to identify the causes, sizes and distribution of cost overruns. Cantarelli (2011) posited that although the problem of cost overrun is generally acknowledged, the causes and explanations are subject to more debates. Ramabhadran (2018) stated that cost overruns causes are dependent on economic, political and cultural factors and are not the same for all countries. Afetornu, Edum-Fotwe, and McCaffer (2006) stated that inflation was the only cause of cost overruns on construction projects in both developed and developing economy. However, earlier study by Achuen and Kolawole (1998) discovered that the most significant causes of cost overruns on public buildings in Nigeria were fluctuations, variations, and adjustments of prime cost sum and provisional sum adjustments. Flyvbjerg, Holm and Buhl (2004) in their study of transport infrastructure Projects in Denmark postulated that cost overruns occur due to optimism bias and misinterpretation. In contrast to Flyvbjerg *et al.* (2004) assertion, Love *et al.* (2012) through an in depth interview of participants of 2 projects taken as case studies to explain cost overrun for social infrastructure projects stated that a significant amount of projects experience cost overruns without optimism bias and strategic misrepresentation. To simply assume that, is misleading considering the complex array of conditions and variables that interact with one another during the project procurement. Love *et al.* (2012) further suggested that pathogenic influences that arise due to strategic decisions taken by top management or key decision makers are the primary causes of overruns.

Memon, Abdul Rahman and Abdul Azis (2012) used questionnaire survey to study the causes of cost overrun of large projects in Southern Part of Peninsular Malaysia. Ranking of results indicated that fluctuation in material prices, cash flow and financial difficulties faced by contractors, delay in progress payment by owners and frequent design changes are the dominant factors causing cost overrun. Spearman correlation test revealed correlation value $\rho = 0.787$ between slow information flow and lack of communication.

In the same vein, Mahamid and Dmaldi (2013) did a field survey of 26 consultants on risks leading to cost overrun in building construction from consultants' perspective. The study classified 41 factors identified through literature review into five groups. Ranking of responses indicated that the top five factors were: political situation, fluctuation of prices of materials, economic instability, currency exchange, and level of competitors.

Isma'il, Zakari and Gambo (2013) identified thirty-eight cost overruns causes that affect the cost of road construction in Nigeria from the literature and ranked them according to responses in order of priority. The finding revealed the four top most influencing factors as increase in global demand for construction materials, out-dated estimates, traffic control planning and corruption.

Pinto (2013) charged that project cost overruns are caused by frequent deliberate and systematic mistakes, including: errors of optimism bias, artificial plan manipulation, poor change control, and inadequate or superficial risk management. However, Rosenfeld (2014) identified 146 potential causes of cost overruns, which were categorized into 15 independent universal root causes. Ranking by 200 professionals revealed that the causes of cost overruns were premature tender documents, too many changes in owners' requirements or definitions and tender-winning prices being unrealistically low (suicide tendering).

Al-Hazim and Abu Salem (2015) studied delay and cost overrun in road construction projects in Jordan by analysing project documents and final reports of projects executed from 2000 to

2008. The study found that terrain conditions, weather conditions and variations were the significant causes of time and cost overruns. Mustefa (2015) also did the analysis of factors affecting time and cost overrun in road construction in Addis Ababa. The study involved reviewing contract documents and questionnaire survey of clients, contractors and consultants. The result of the analysis revealed that design change, fluctuation in material costs and inadequate review of drawings and contract documents were the most common causes of cost overruns.

Using questionnaire survey of 50 respondents, Rajakumar (2016) did an analysis of cost overrun in road construction activities in India. The study requested the respondents to rank 30 identified causes of cost overruns on a scale of 0 to 3, which were analysed using relative importance index (RII). The critical factors contributing to cost overruns included land related issues, inflation, delay in payment, force majeure, design changes, etc.

Ahady, Gupta, and Malik (2017) did a critical review of the causes of cost overruns in construction industries in developing countries. The research identified the causes of cost overruns from different studies conducted on 10 countries and revealed that many factors cause construction projects to overrun cost. The study also found that although the causes are different for every project, most of the causes in development countries are similar. Fluctuations and increases in material price were found as the most important causes of cost overruns.

Similarly, Aljohani, Ahiaga-Dagbui, and Moore (2017) conducted a literature review on construction projects cost overruns to identify their main causes. The study classified 366 causes of cost overruns identified from the review of literature into internal and external factors, which were further categorised into 8 factors. The study showed that although the most identified causes of cost overruns from most studies are poor project management related, causes of cost overruns differ from country to country and that the identification of causes for a specific country from only the global literature is inaccurate.

METHOD

The relevant information necessary for this study was obtained through a detailed review of literature in relevant works. The information gathered formed the bases for the data collection and analyses. Using questionnaire survey, examination of road construction projects' documents and interviews, data for the study were obtained from various consultancy out-fits, contractors and the clients organisations that have worked on the Federal Capital Authority, Abuja road constructions projects.

This study is part of a PhD research that uses partial least squares structural equation modelling (PLS-SEM) as the main analytical approach of the questionnaire data. The sample size was therefore obtained based on the requirements of the PLS-SEM method. A minimum of 240 cases were needed for the analysis in that particular research, hence, 450 questionnaires were distributed to consultants, contractors and client's/clients representatives to ensure enough responses were retrieved. Three hundred and twenty-eight (328) questionnaires were retrieved from the respondents, out of which 267 were fully completed. The questionnaire contained seventy-one (71) causes of cost overruns that were identified from the review of literature. Respondents were requested to indicate the importance of each cause on a five-point Likert scale to measure a range of opinions with 1, 2, 3, 4 and 5 as least, low, average, significant and most significant respectively.

Unstructured interviews were conducted to get better understanding of opinions and increased confidence in the research data. The personal interviews were carried out on 10 road construction professionals involved in road constructions within the Satellite Towns Development and Engineering Departments of the FCTA. Ten (10) respondents were considered adequate number for the interview since qualitative studies are not concerned about the number of representativeness of the population (Steinberg, 2008). Moreover, Guest, Bunce and Johnson (2006) shows that data saturation can occur within the first twelve interviews after which very few phenomena are likely to emerge. The interviews were used to get experts' opinions of the most significant cost overruns causes.

FCTA road construction documents that contained the necessary information on road construction costs were examined and the required information for the research were collected. This information included project budgeted cost and final cost of 142 road construction projects executed between 2004 and 2014. The information obtained was used in determining the extent of cost overruns. All road construction costs information was obtained from Bill of Engineering Measurement and Evaluation (BEME), payment certificates and working drawings. The estimated costs were obtained from the BEME while the actual costs were found from the certificates and calculation of costs from the actual quantities on working drawings and rates at which the works were executed.

Data Analysis

This study is a mixed method research involving both quantitative and qualitative data. Data were collected through questionnaire survey, interviews, and from the examination of road construction projects documents. The type of data collected determined the method of data analysis. The study therefore used both quantitative and qualitative methods for the analysis of data. Data from the questionnaires were analysed using descriptive statistics and ranking while ratio of discrepancy was used to determine the extent of cost overruns from the construction documents. The interview data were analysed using thematic analysis.

Ratio of discrepancy

The extent of cost overruns on the roads projects was determined through evaluating the magnitudes and frequency of occurrence. The magnitude was determined by calculating the ratio of discrepancy of the cost from the initial estimated cost of construction using equation (1). Data on 142 FCTA road projects were collected for the analysis.

$$\lambda_i = ((\kappa - \varepsilon) / \varepsilon); i = 1 \dots n \quad (1)$$

Where κ is the actual cost and ε is the estimated cost (Mahamid & Bruland, 2011).

Ranking of responses

The collected data from the questionnaire survey were rated using the Relative Importance Index (RII) method of descriptive analysis (Equation 2) (Zeng, Tian & Tam, 2005). Where M5, M4, M3, M2 and M1 are frequencies of the ranking given to each cause of cost overruns.

$$RII = \frac{5M5 + 4M4 + 3M3 + 2M2 + M1}{5(M5 + M4 + M3 + M2 + M1)} \quad (2)$$

Thematic analysis

The interviews were analysed using thematic analysis, which involved transcribing the recordings into text. The texts were repeatedly read to search for meanings and patterns, and

to note items of interest. These items of interest were sorted into sub themes by organising items of similar interest into categories. Each theme was reported. Themes that had statements like “the major reason ...” were considered as salient and those that had frequently occurring codes were identified as frequent. Themes that were neither frequent nor salient were discarded (Buetow, 2010)

RESULTS AND DISCUSSION

The demography of the questionnaire respondents as well as the interviewee’s information were necessary in assessing suitability of their responses for the study.

General/Organisational Information of Questionnaire Survey Respondents

Respondents’ age is an important characteristic of the collected data. It shows the level of maturity of the respondents, and in most times their experience. Table 1 shows the information on questionnaire survey respondents. Of the 267 respondents, 3 (1.12%) were below 30 years old, 86 (32.21%) were between the ages of 31 and 40 years, 143 (38.95%) were from the age group 41 to 50 years old, while 74 (27.72%) were above 50 years old.

Regarding the level of education, 19 (7.12%) of the respondents had OND, 130 (48.69%) had HND/BSc, 97 (36.33%) had their second degree and 21 (7.87%) were PhD holders. This implies that respondents were competent, capable of exercising sound judgement and could provide the researcher with needed information for the study. Hence, the responses given could be relied upon for the study. In respect with type of organisation, 62 (23.22%) of the respondents were from consultants. The highest response rate was from clients, which was 106 (37.08%). The responses from the contractors were 99 (37.08%).

All of the respondents were road construction practitioners; out of which 77 (28.84%) have 6 - 10 years of experience on road construction. 45 (16.85%) are 11 – 15 years experienced, 85 (31.84%) are 16 to 20 years experienced and 60 (22.47%) have 21 years or more experience in

Table 1: Questionnaire Respondents' Information

Category	Frequency	Percentage	
Age (years)	< 30	3	1.12
	31 – 40	86	32.31
	41 – 50	143	38.95
	51 -60	74	21.72
Organisation	Client	106	39.70
	Contractor	99	37.08
	Consultant	62	23.22
Education	OND	19	7.12
	HND/BSc	130	48.69
	MSc	97	36.33
	Ph.D.	21	7.87
Experience (years)	6 – 10	77	28.84
	11 -15	45	16.85
	16 – 20	85	31.84
	≥ 20	60	22.47
Number of road projects worked on	≤ 5	58	21.72
	6 – 10	82	30.71
	> 10	127	47.57

road constructions. Fifty-eight (21.72%) of the professionals have worked on the construction of about 5 road projects, 82 (30.71%) on 6 -10 road projects while 127 (47.57%) were involved in the development of more than 10 road projects (Table 1). This indicates that well experienced personnel with knowledge on road construction were involved in the survey. It also implies that their opinions can be relied upon.

General Information on Interview Participants

The demography of the interviewees is shown in Table 2. The interview participants had an average age of 48 years and an average working experience of 22 years on road constructions. Four (4) of the participants had MSc while the other six (6) were Ph.D. holders. The experience and level of education indicate the suitability of the participants for the interviews.

Table 2: Interview Participants' Demography

I. D.	Age	Category	Education	Experience (years)
IA	43	Client	MSc.	20
IB	45	Consultant	Ph.D.	18
IC	58	Contractor	Ph.D.	32
ID	52	Contractor	MSc.	30
IE	35	Consultant	MSc.	11
IF	55	Client	Ph. D.	29
IG	37	Contractor	Ph. D.	7
IH	47	Client	Ph. D.	22
II	46	Consultant	Ph. D.	24
IJ	59	Client	MSc.	31

Extent of Cost Overruns on Road Construction Projects

The 142 road projects constructed between 2004 and 2014 had a total cost increase of forty-six billion, one hundred and ninety-one million, one hundred and forty-three thousand, six hundred and eighty-seven Naira, twenty-seven kobo (₦ 46,191,143,687.27), which is equivalent to average cost overruns of 54.62%. Ten (7.04%) of the projects were completed within the estimated cost, while one hundred and thirty-two (92.96%) had cost deviations ranging from +1.18% to 135.41%. The mean cost overruns for FCTA road construction projects was 14.86% higher than the 39.70% Nigerian road projects’ average cost overruns reported by Alexeeva, Padam, and Queiroz, (2008).

Table 3 however shows that average cost overruns on road construction projects according to survey responses was in the range of 21 - 40%, but 6.05% lower than Alexeeva *et al.* (2008) finding. It is also apparent from table 3 that although 11.23% (30) respondents reported that 100% of the road projects they were involved in had cost overruns, 25.09% (67) worked on 61 – 80% road projects that were successfully completed within their estimates. While 34.83% (93) of the respondents had less than 20% projects completed without cost overruns, 49 (18.35%) worked on 21 - 40% road projects without cost overruns. The 7.63% (28) of respondents executed 41 – 60% road construction within estimates. These suggest that in general 67.51% of road projects were constructed with cost overruns.

The discrepancies in the magnitudes and frequencies of cost overruns from the questionnaire survey and the construction documents can be attributed to the fact that the responses from the survey were based on the participants’ experience on Nigerian road construction projects in general. This implies that cost overruns on FCTA road construction projects are more severe compared to the average cost overruns on Nigerian road.

Table 3: Extent of Cost overruns on Road Construction Projects

Proportion of Road Projects Completed Within Estimated Costs by Respondents						
Road Projects Completed with Estimated Costs	0%	< 20%	21 – 40%	41 – 60%	61 – 80%	
Frequency	30	93	49	28	67	
Mean 32.49	Median < 20		Mode < 20			
Magnitude of Cost Overruns (%)						
Cost Overruns on Projects that exceeded Initial Estimates	10 – 20%	21 – 40%	41 – 60%	61 – 80%	> 80%	
Frequency	119	64	31	37	16	
Average Magnitude 33.65	Median	21 – 40	Mode	21 – 40		

Most Significant Causes of Cost Overruns

Inflation was found to be the most significant cause of cost overruns in FCTA road construction projects (Table 4) from the questionnaire survey analysis. This means that with the increase in the prices of goods and services and the fall in the purchasing power of Naira, the construction of roads is more expensive than originally planned. This finding is concurrent with the findings of Afetornu *et al.* (2006) and Nega (2008). The result also agrees with Rajakumar (2016) 2nd factor contributing to road construction cost overruns. Fluctuation in prices that was ranked as the 2nd most significant cause of cost overruns in this study was also identified by Binchak (2008) and Ahady, Gupta, and Malik (2017) as a major cause of cost overruns on construction projects. Prices of equipment usually fluctuated with the changes in fuel prices leading to increase over estimated cost. Exchange rate fluctuations, which was identified as the 3rd most important cause of cost overruns is caused by changes in demand and supply of the currency. FCTA roads are sometimes awarded both in foreign and local currencies, therefore, fluctuations of exchange rate will increase uncertainty on the contracts. The 4th most significant cause of cost overruns; change in government policies often lead to increase in the cost of materials and equipment, which ultimately increases the cost of construction and leads to cost overruns. Variation, which was the 5th most significant cause of road construction project cost overruns, was the 2nd and 3rd most important reason for construction cost overruns found by Achuen and Kolawole (1998) and Al-Hazim and Abu Salem (2015) respectfully. Although variation is usually for remediation of cost incurred for errors or alterations, it is a deviation from a well-defined scope and affects the cost of construction since any addition or alteration may ultimately increase a project’s cost.

However, the three main causes of cost overruns on FCTA road construction projects discovered from the construction documents were delays in payment, design changes and unforeseen ground conditions. There were instances when the contractor’s payments were delayed for over a year, which led to the stoppage of work by the contractors pending the availability of funds; thereby halting the progress of works and exposing the contracts to risks of inflation and rework. Delayed payment usually causes cash flow problems to contractors leading to delays in project progress, disputes, more delays, and cost overruns. The problem of delayed payment to contractors was as ranked 3rd reason of cost overruns in Rajakumar (2016) study.

There were also instances where designs had to be changed. In most cases construction work commenced before the final design was completed. Design changes involved significant

alterations on the original designs to correct poor or unfeasible designs. These caused delays, variations and ultimately cost overruns. Similarly, difficulties experienced during construction works due to unforeseen ground conditions contributed to construction cost escalations. Insufficient site investigations prior to commencement of construction works made the road projects vulnerable to unforeseen ground conditions, which led to delays and cost escalations, thereby contributing to cost overruns.

Table 4: Ranking of Causes of Cost Overruns

Cost Overruns Causes	RII	Rank
Design changes	3.48	14
Inflation	4.17	1
Fluctuation of prices	4.04	2
Variations	3.76	5
Monthly payment difficulty	3.49	13
Lowest bidder policy	3.68	8
Exchange rate	3.96	3
Inaccurate cost estimates	3.50	12
Delay in progress payment	3.47	15
High interest rate on loans	3.63	9
Government related issues like changes in policies, pressures etc.	3.91	4
Corruption	3.71	7
Escalation of material prices	3.75	6
Economic instability	3.57	10
Government taking too many projects at a time	3.54	11

However, responses from the interviews (Table 5) showed that the persistence of road construction cost overruns depend on a number of diverse issues. All the interview participants reported different causes, however, most (70%) of the of the responses indicated that cost overruns continue to happen on road construction projects as a result of multiple causes that are interrelated. According to IB, *“One can’t blame the reason for the persistence of overruns on any one cause”*. This assertion was also confirmed by IG, who said, *“The reasons for roads’ cost overruns are many and varied and usually, one cause leads to another”*.

Among the many causes indicated by the interviewees, corruption was the most recurring reason for the occurrence of cost overruns in road constructions. On highlighting this, IC explicitly emphasised that:

Corruption; yes, that is the major source of most of the problems we have in Nigeria and off course, the reason for the continued occurrence of road cost overruns. There are many reasons why cost overruns continue to exist, but from whichever angle you look at the issue, and no matter what reason you come up with, all boil down to corruption.

On this point, IA noted that although it is difficult to identify the problem with a single cause, one of the main reasons is corruption and according to him *“the second issue is corruption in all its manifestations. The contractor has to use part of the contract money to settle the top officials that facilitated the award of the contract”*. Similarly, II corroborated that:

The problem is that the contract award process lacks transparency and accountability. The procurement system has completely been abused. Politicians usually influence the awards of contracts to companies they have interest in. Of course, these companies give something to the politicians in return for ensuring they are awarded the jobs.

Table 5: Interview Responses on Causes of Road Construction Cost Overruns

Theme	Code	Frequency	Saliency
Multiple causes	Multiple	7	High
Financial related	Delay in payment	2	High
Construction management	Delaying work	4	Low
	Construction errors	1	High
Contract related	Low estimates	3	High
	Scope changes	1	High
	Delay in tender	2	High
Technical related	Ground conditions	5	High
	Uncertainty/risks	2	High
	Lack of knowledge	3	Low
Economic & Political	Corruption	8	High
	Inflation	6	High

NB: Only items with high saliency and or frequency are displayed here

However, inflation was identified as a very important reason for the persistence of road constructions' cost overruns by four (4) of the interviewees. Two (2) of the interviewees highlighted that inflation impacts on road construction cost because it is not considered when tendering for road construction projects. As stated by IG: *“the contingency does not take into account the inflation, which is always on the rise”*. Road constructions, being projects implemented over a very long duration are at risk of inflation especially when delayed.

Supporting this, IE stated: *“High level of inflation and intense price fluctuations that were not considered during the tender period now set in and cost overruns occur”*. Similarly, delays are encountered between the time of the approval of budgets and that when tender analysis is done. In this regard IG stressed that *“They will do the tender after the budget for the road project has been approved and there is usually a very long time interval before the bidding process is completed”*.

Delay in payment by the client to the contractor for work executed also had high saliency. Delayed payment causes serious cash flow problems for the contractor and consequently affects construction process. This was reported by two (2) interview participants and as IG explained:

The payment process is also a very big issue; the contractors sometimes raise many CVs but are not paid on time. We end up changing our working pattern (laughs) i.e. reducing the amount of time spent working on site and eventually abandoning the site until we get paid.

While the statements clearly suggest that the contractor blamed the clients for delaying payments for works that have been carried out which leads to the occurring of cost overruns,

the consultant has a different explanation. IE expressed: *“The main cause of cost overruns is that contractors hardly consider the possibility of risks when they bid for projects”*. This, according to two interviewees, is driven by their desire to keep their tenders very low so that they are able to win contracts. Low estimates, scope changes and delay in tender process though had low frequencies, were important causes of road construction cost overruns identified. Enumerating the reasons for the persistence of road construction cost overruns, IB stated: *“First of all, it is the lowest bidder policy which compels the eager contractor to submit very low and most times, unrealistic tenders.”*

However, another interview participant pointed out that scope change is the most serious reason for the persistent overruns on road construction projects’ costs. The scope changes, IA explained result from design errors or misrepresentation. According to IA: *“the most serious is frequent changes due to design errors or (quiet for a moment) intentional mistakes by the consultants. I believe they hardly even visit the sites before embarking on the designs of the roads.”* These mistakes, usually, are only rectified through rework, which escalates the cost of construction. Highlighting on this, IH stressed: *“At the end of the day, there has to be rework because some very important aspects of the construction are initially missed”*.

It was similarly gathered from the interview that unforeseen ground conditions contribute to road constructions cost overruns. Interview participant ID iterated *“Any unexpected condition met along the right of way or adjacent areas would change the cost of construction to some extent.”*

Among the many reported reasons for the persistence of cost overruns on road constructions by interview participants, corruption, which was one of the causes of road’s cost overruns identified by Isma’il *et al.* (2013) and inflation, were the most mentioned. However, there were many other causes that were indicated with high importance to be responsible for the occurrence of cost overruns. It can be inferred from the findings that reasons for road construction cost overruns are many and interrelated. Although some causes may not be very significant on one project, they may be the most significant causes on some other projects, as the road construction conditions may vary. The findings also indicate that although the most suggested reason for cost overruns were corruption and inflation (Economic and political related causes), every road project has its own different reason for overrunning its cost and these reasons could unfold in any aspect of road development.

CONCLUSION

The study set out to determine the extent of FCTA road construction projects’ cost overrun and identify the most significant of its causes. The result showed that 92.96% of FCTA road construction projects suffered an average cost overrun of 54.62%. The findings of this study also revealed different causes of cost overruns for the different methods employed. It therefore implied that although inflation, fluctuation of prices, corruption, delay in payments, and unforeseen soil conditions among others were identified as the most significant causes of cost overruns on road constructions, the reason for cost overruns cannot be attributed to a single reason. Different road projects have different challenges and experience different magnitude of cost overruns that result from various reasons. It can therefore be concluded that findings on one road are not always applicable to other roads.

In light of these findings, this study recommends that the most effective way of minimising cost overruns will be to take proactive measures by always identifying indicators of cost

escalations in all phases of road construction and taking actions to control them. In cases where cost escalates, holistic approach should be employed in addressing the problem.

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