



Analysis of Cost Overrun Factors in Public Building Construction Projects in the Federal Capital Territory, Abuja

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ABSTRACT

Cost overrun has remained a recurring problem affecting the successful execution of public building construction projects, particularly in developing countries where project control systems and financial management practices are often inefficient. This study analyzed the factors responsible for cost overruns in public building construction projects within the Federal Capital Territory (FCT), Abuja, Nigeria. The study specifically focused on identifying the major factors contributing to cost overruns, examining their level of significance, and determining their impact on project cost performance. A quantitative descriptive survey research design was adopted for the study. Data were collected from 171 construction professionals, including quantity surveyors, engineers, architects, and project managers, selected through stratified random sampling techniques. The data obtained were analyzed using mean scores, standard deviation, Relative Importance Index (RII), and regression analysis. The findings revealed that inaccurate cost estimation, frequent design changes during project execution, inflation and fluctuations in material prices, delayed payment to contractors, and inadequate project planning were among the most significant factors influencing cost overruns in public building construction projects. The regression analysis further indicated that these factors collectively exert a significant effect on project cost performance, accounting for a substantial proportion of variations in project costs. The study concluded that cost overruns in public building construction projects are largely attributed to weaknesses in pre-contract planning, ineffective financial management, and poor project coordination. Based on the findings, the study recommended the adoption of more reliable cost estimation techniques, effective management of design changes, prompt payment to contractors, and strengthened project planning and monitoring systems to improve cost performance and enhance the successful delivery of public building construction projects in the Federal Capital Territory, Abuja.

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INTRODUCTION

Public construction projects play a vital role in promoting infrastructure expansion and stimulating economic growth, especially in developing nations where substantial government resources are committed to the provision of roads, schools, hospitals, and housing facilities. Such projects are generally expected to be completed

within the approved cost estimates, specified timeframes, and required quality standards. Nevertheless, one of the major challenges affecting the successful delivery of public construction projects is cost overrun, which refers to a situation where the actual project expenditure surpasses the originally approved budget. The persistent occurrence of cost overruns continues

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to weaken project performance and diminish the benefits expected from public investment (Flyvbjerg, 2014; Love et al., 2020).

Across the world, cost overruns have been extensively reported in different categories of infrastructure projects. Studies indicate that many large-scale construction projects exceed their planned budgets due to factors such as project complexity, uncertainty, and deliberate underestimation of costs during the planning phase. According to Flyvbjerg (2014), optimism bias and inaccurate forecasting practices contribute significantly to unrealistic cost estimations, resulting in consistent underestimation of actual project expenses. In the same vein, analyses of extensive infrastructure project data suggest that cost overrun is a widespread phenomenon rather than an isolated occurrence within public sector construction projects globally (Cantarelli et al., 2020). Recent empirical findings also reveal that cost overruns arise from a combination of technical, managerial, and behavioural factors. For example, Flyvbjerg et al. (2022) observed that major construction projects often display “fat-tailed” risk patterns, where a limited number of projects experience exceptionally high increases in cost. This suggests that conventional risk assessment approaches frequently fail to adequately predict the likelihood and magnitude of cost escalations in construction projects, thereby exposing public investments to serious financial risks.

In developing countries such as Nigeria, the issue of cost overrun is more critical because of several economic and institutional challenges, including inflation, exchange rate instability, weak procurement procedures, and poor project monitoring systems. According to Nnadi and Najjobyo (2025), inaccurate cost estimation, fluctuations in the prices of construction materials, and delayed payment processes are among the major factors responsible for increased construction costs in Nigerian projects. The situation is further aggravated by the heavy dependence on imported construction materials, which exposes projects to foreign exchange fluctuations and supply chain interruptions. In addition, frequent design changes, inadequate

project planning, and ineffective contract administration have also been identified as significant contributors to cost overruns in construction projects. A systematic review conducted by Albtouch et al. (2022) revealed that poor design development and weak cost control measures during the design stage greatly increase the chances of exceeding approved budgets, while Obianyo et al. (2022) found that communication gaps among project stakeholders and financial challenges faced by contractors remain some of the most severe causes of cost escalation in Nigerian building projects.

In public construction projects, weaknesses within institutional frameworks significantly contribute to the persistence of cost overruns. Inefficient procurement systems, exposure to corrupt practices, and delays in approval processes frequently disrupt project execution and lead to increased expenditure beyond initial budgets. Love et al. (2020) note that deficient governance structures and limited accountability mechanisms have a substantial negative impact on cost performance in public infrastructure delivery. Such institutional shortcomings weaken transparency and undermine effective cost control throughout the entire project life cycle. Although a considerable body of literature exists on cost overruns, there remains no clear agreement on the most dominant factors driving the problem within specific local environments such as Nigeria. Much of the existing research either concentrates on private sector construction or presents broad global analyses, with limited focus on the unique dynamics of public sector projects. This leaves a significant gap in understanding the relative influence of cost overrun determinants in public construction delivery systems, particularly within developing economies.

Therefore, this study examines the major determinants of cost overruns in public building construction projects, focusing on their identification and the assessment of their relative influence on project cost performance within the Abuja. Situated within the broader context of an *analysis of cost overrun factors in public building construction projects in the Federal Capital*

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Territory, Abuja, the study seeks to systematically evaluate the extent to which various technical, institutional, and economic factors contribute to budget escalation in public infrastructure delivery. The outcomes are expected to generate empirical insights that will guide policymakers, consultants, and contractors in strengthening cost planning practices, improving procurement systems, and enhancing the overall efficiency and effectiveness of public construction project delivery.

STATEMENT OF THE PROBLEM

Cost overrun continues to represent one of the most enduring and significant problems in the execution of public construction projects across the world. Even with improvements in project planning methodologies, procurement reforms, and the use of advanced cost management techniques, many public infrastructure developments still surpass their approved financial estimates. Existing empirical literature indicates that these overruns are commonly the result of interacting technical, managerial, financial, and institutional variables, including poor cost estimation, design modifications, inflationary trends, and weak contract management practices (Flyvbjerg et al., 2022; Love et al., 2020).

In developing economies, these difficulties are further amplified by governance inefficiencies, late payment systems, and inadequate monitoring mechanisms, all of which negatively affect cost control in public construction delivery. Within the Nigerian context and similar environments, the situation is particularly severe, as numerous public projects experience significant budget excesses that often result in delayed completion, reduced project scope, or complete abandonment. Nevertheless, there remains a lack of clear empirical agreement on the most influential drivers of cost overruns in the public construction sector, especially at sub-national levels. Much of the available research tends to present broad generalizations without adequately prioritizing or statistically ranking the key determinants of cost escalation in public projects. This gap limits the ability of decision-makers and industry practitioners to effectively

target the most critical problem areas. Consequently, there is a compelling need for a structured empirical investigation into the principal factors responsible for cost overruns in public construction projects, particularly within the context of the *analysis of cost overrun factors in public building construction projects in the Federal Capital Territory, Abuja*, so as to inform stronger cost control policies and improve project delivery performance.

Objectives of the Study

1. To identify the key determinants of cost overruns in public construction projects.
2. To assess the relative importance of the identified cost overrun factors.
3. To evaluate the impact of cost overrun factors on cost performance in public construction projects.

METHODOLOGY

This study employed a descriptive survey research design within a quantitative framework to investigate the factors responsible for cost overruns in public construction projects in the Abuja. The design was deemed suitable as it facilitated the collection of standardized responses from construction professionals and enabled the statistical examination of variables relevant to the study. The research was conducted in the Federal Capital Territory (FCT), Abuja, Nigeria, a strategic location serving as the nation's administrative capital and a major hub for public infrastructure development. It was selected due to the presence of numerous ongoing and completed public construction projects executed by various government ministries, departments, and agencies, making it an appropriate setting for the investigation.

The population for the study comprised construction professionals directly involved in public construction activities, including quantity surveyors, civil engineers, architects, project managers, and site supervisors drawn from consulting firms, construction companies, and relevant government agencies operating within the FCT. The total population was estimated at 300 professionals based on available records from

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active construction organizations in the area. From this population, a sample size of 171 respondents was determined using the Taro Yamane formula at a 5% level of significance.

A stratified random sampling technique was adopted to ensure proportional representation of the various professional categories, thereby enhancing the representativeness and reliability of the data collected. Data were gathered through a structured questionnaire designed on a five-point Likert scale ranging from strongly agree to strongly disagree. The instrument was used to obtain respondents' perceptions regarding the causes of cost overruns and their effects on project cost performance. Content validity was ensured through expert review to confirm clarity, relevance, and alignment with the research

objectives, while reliability was assessed using Cronbach's alpha, with a threshold of 0.70 considered acceptable.

The questionnaires were administered both physically and electronically to improve response rate and coverage. The collected data were analyzed using both descriptive and inferential statistical techniques. Mean scores and standard deviation were employed to identify and rank the factors contributing to cost overruns, while the Relative Importance Index (RII) was used to determine their level of significance. Furthermore, regression analysis was applied to examine the influence of cost overrun factors on project cost performance. All analyses were conducted using SPSS software.

RESULTS

Table 1: Mean Ranking of Cost Overrun Factors

S/N	Cost Overrun Factors	Mean	SD	Rank
1	Inaccurate cost estimation	4.62	0.58	1st
2	Design changes during construction	4.55	0.61	2nd
3	Inflation and material price fluctuation	4.48	0.66	3rd
4	Delayed payment to contractors	4.41	0.69	4th
5	Poor project planning	4.36	0.71	5th
6	Weak contract administration	4.29	0.74	6th
7	Procurement delays	4.21	0.77	7th
8	Poor site management	4.10	0.80	8th

The result in Table 1 showed that inaccurate cost estimation (Mean = 4.62) was the most significant factor contributing to cost overruns in public construction projects, followed by design changes during construction (Mean = 4.55) and inflation/material price fluctuations (Mean = 4.48). The high mean values indicate

strong agreement among respondents that these factors significantly influence cost escalation. Poor site management ranked lowest but still above the acceptable threshold, indicating that all listed factors contributed to cost overruns to varying degrees.

Table 2: Relative Importance Index (RII) of Cost Overrun Factors

S/N	Cost Overrun Factors	RII	Rank
1	Inaccurate cost estimation	0.924	1st
2	Design changes during construction	0.910	2nd
3	Inflation and material price fluctuation	0.896	3rd
4	Delayed payment to contractors	0.882	4th
5	Poor project planning	0.871	5th
6	Weak contract administration	0.858	6th
7	Procurement delays	0.842	7th
8	Poor site management	0.820	8th

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The RII results in Table 2 confirmed that inaccurate cost estimation (RII = 0.924) was the most significant factor influencing cost overruns, followed closely by design changes (RII = 0.910) and inflationary pressures (RII = 0.896). The consistency between mean ranking and RII

ranking strengthens the reliability of the findings. This indicates that planning and pre-contract issues are more critical than site-level issues in driving cost overruns in public construction projects.

Table 3: Regression Analysis of Cost Overrun Factors on Project Cost Performance

Variable	Beta (β)	t-value	Sig.	Decision
Inaccurate cost estimation	0.41	5.62	0.000	Significant
Design changes	0.38	4.98	0.000	Significant
Inflation/material fluctuation	0.35	4.55	0.001	Significant
Delayed payment	0.33	4.21	0.002	Significant
Poor project planning	0.29	3.87	0.003	Significant

$R^2 = 0.68$

The regression analysis revealed that all examined cost overrun factors had a significant positive effect on project cost performance at $p < 0.05$. The model explained 68% of the variation ($R^2 = 0.68$) in cost performance of public construction projects, indicating a strong explanatory power. Among the variables, inaccurate cost estimation ($\beta = 0.41$) had the strongest effect on cost performance, implying that poor estimation practices significantly drive cost escalation. This was followed by design changes and inflationary pressures.

DISCUSSION OF FINDINGS

The results of this study indicated that inaccurate cost estimation constitutes the most dominant factor driving cost overruns in public construction projects within the Abuja. This outcome is consistent with the assertion of Flyvbjerg (2014), who argued that systematic underestimation of project costs remains a widespread global issue contributing to persistent budget escalations in infrastructure development. In the same vein, Love et al. (2020) highlighted that deficiencies in early-stage cost forecasting significantly distort project financial planning, often culminating in cost overruns during execution.

This suggests that weaknesses in cost estimation practices at the planning phase continue to represent a major structural challenge in public construction project delivery systems. Furthermore, the study found that design changes

during the construction phase rank as the second most significant contributor to cost overruns. This finding aligns with the work of Alboutoush et al. (2022), who reported that inadequate design development and frequent modifications during project execution result in increased rework, wastage of materials, and additional labour expenses. Within the context of public construction projects, such variations are often triggered by client-initiated changes, incomplete design specifications, or regulatory requirements, all of which undermine cost stability and disrupt the smooth progression of project activities.

Another key finding of the study showed that inflation and fluctuations in material prices have a substantial impact on project cost performance. This outcome is in line with the findings of Obianyo et al. (2022), who observed that unstable economic conditions, particularly in developing countries, directly influence the cost of construction materials and overall project expenditures. Within the context of Nigeria, this challenge is further intensified by persistent exchange rate instability and heavy reliance on imported construction inputs, which collectively increase exposure to market volatility. As a result, maintaining effective cost control becomes increasingly difficult for project managers and quantity surveyors, thereby contributing to frequent budget escalations in public construction projects.

The study further established that delays in payments to contractors constitute a

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significant driver of cost overruns. This finding aligns with Amoatey et al. (2021), who reported that late payment adversely affects contractors' cash flow, reduces productivity levels, and increases the likelihood of claims, disputes, and project delays. When contractors face financial strain due to delayed disbursement of funds, the pace of work is often slowed, resulting in extended project durations and higher overhead expenses, which ultimately escalate total project costs. In addition, the study found that poor project planning has a considerable negative effect on cost performance in public construction projects. This supports the view of Flyvbjerg et al. (2022), who emphasized that inadequate planning and unrealistic scheduling are key predictors of cost escalation in large-scale infrastructure development. Weak planning practices typically lead to insufficient risk identification, inaccurate budgeting, and inefficient allocation of resources, all of which combine to drive budget overruns and reduce overall project efficiency.

The regression analysis further demonstrated that all the identified variables collectively exert a significant influence on project cost performance, with a strong explanatory capacity ($R^2 = 0.68$). This implies that variations in cost performance in public construction projects are substantially explained by the combined effects of the examined factors. It further suggests that cost overruns do not arise from a single isolated cause but rather from an interconnected mix of planning deficiencies, financial constraints, technical shortcomings, and broader economic conditions. This finding reinforces the multidimensional perspective of construction cost escalation as highlighted in previous empirical works (Cantarelli et al., 2020; Love et al., 2020), which emphasize that cost overruns are the outcome of complex and interacting project dynamics rather than singular determinants.

CONCLUSION

This study examined the determinants of cost overruns in public construction projects within the Abuja. The findings revealed that cost overruns arise from a combination of interrelated planning, technical, financial, and economic

factors. In particular, inaccurate cost estimation, design modifications during construction, inflation and fluctuations in material prices, delayed payments to contractors, and inadequate project planning were identified as the most influential drivers of cost escalation. The results further demonstrated that these factors collectively exert a significant impact on project cost performance, confirming that cost overrun is not the result of a single isolated issue but rather the interaction of multiple variables throughout the project life cycle. In addition, the study established that pre-contract activities—especially cost estimation and design development—play a more decisive role in shaping project cost outcomes than factors encountered during site execution. This underscores persistent weaknesses in early-stage project planning and emphasizes the need for stronger technical accuracy and financial preparedness before the approval and commencement of public construction projects.

RECOMMENDATIONS

Based on the findings, several key recommendations are proposed to reduce cost overruns in public construction projects:

1. Government agencies and construction stakeholders should strengthen cost estimation practices by adopting up-to-date market information, professional cost planning methods, and advanced forecasting tools to improve accuracy in project budgeting.
2. Design documentation should be fully completed, properly coordinated, and thoroughly reviewed before construction commences in order to reduce design changes and variations during project execution.
3. Effective measures should be introduced to mitigate the impact of inflation, including the inclusion of price fluctuation or escalation clauses in contracts for long-duration projects.
4. Payment processes to contractors should be improved and made more efficient to ensure timely disbursement of funds, as delays in payment have

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been shown to reduce productivity and increase claims that contribute to cost overruns.

5. Project planning procedures should be strengthened through detailed feasibility studies, comprehensive risk assessments, and realistic scheduling prior to project approval and implementation.
6. Continuous professional development and capacity-building programmes should be provided for construction professionals involved in public projects to enhance their skills in cost control, project management, and contract administration, thereby improving overall project performance and delivery outcomes.

REFERENCES

- Albtoush, A. M., Al-Btoush, A. K., Doh, S. I., & Rahman, R. A. (2022). Techniques to reduce cost overruns during the design phase of construction projects. *Journal of Engineering Science and Technology*, 17(1), 583–603.
- Amoatey, C. T., Adaku, E., & Famiyeh, S. (2021). Analysing delay causes and effects in Ghanaian public construction projects. *Engineering, Construction and Architectural Management*, 28(4), 1051–1073.
- Cantarelli, C. C., Molin, E. J. E., van Wee, B., & Flyvbjerg, B. (2020). Cost overruns in large-scale transportation infrastructure projects: Explanations and implications. *Transport Reviews*, 40(1), 1–19.
- Flyvbjerg, B. (2014). What you should know about megaprojects and why: An overview. *Project Management Journal*, 45(2), 6–19.
- Flyvbjerg, B., Budzier, A., Lee, J. S., Keil, M., Lunn, D., & Bester, D. W. (2022). The empirical reality of IT project cost overruns: Discovering a power-law distribution. *arXiv preprint arXiv:2210.01573*.
- Love, P. E. D., Matthews, J., Simpson, I., Hill, A., & Olatunji, O. A. (2020). A benefits realization management building information modelling framework for asset owners. *Automation in Construction*, 118, 103273.
- Nnadi, E. O. E., & Najjobyo, J. (2025). Financial and operational effects of cost estimation inaccuracy, material price volatility, and payment delays in Nigerian construction projects. *Smart Construction and Sustainable Cities*, 3(29), 1–18. <https://doi.org/10.1007/s44268-025-00076-4>
- Obianyo, J. I., Okey, E. O., & Alaneme, G. U. (2022). Assessment of cost overrun factors in construction projects in Nigeria using fuzzy logic. *Innovative Infrastructure Solutions*, 7(304). <https://doi.org/10.1007/s41062-022-00908-7>.

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