Received: 15th July 2025, Accepted: 23rd July 2025, Published: 24th July 2025

INTERNATIONAL JOURNAL OF REAL ESTATE
IJRE
ISSN: 2476-8073

EVALUATION OF THE DETERMINANTS OF COST OVERRUN IN REAL ESTATE CONSTRUCTION PROJECTS IN AWKA, ANAMBRA STATE

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DOI: *https://doi.org/10.5281/zenodo.16410695*

ABSTRACT

The evaluation of cost overrun determinants were carried out in this research study using descriptive statistical design tool to analyze survey reports from both professionals in the construction industry and investors/risk bearers. The investigative study involved 506 respondents comprising of Architects, Builders, Estate surveyors and Quantity surveyors in Awka Anambra state using a well-structured questionnaire design. Two research questions; what are the determinants of cost overrun in real estate construction projects in the study area? And, what are the effects and the level of effects of the determinants of cost overrun in real estate construction projects? And corresponding hypotheses guided the study. Descriptive statistics (mean, percentage and frequency) were adopted in answering the research questions, while regression analysis were used in angering the research hypotheses. Findings reveal that cost overrun occurs in real estate construction projects caused by various factors at different degrees ranging from project management factors to experience and service level factors, leading to abandoned projects, engagement of quacks, and indecision by the project owner. It was therefore recommended that real estate developers should adopt and implement advanced project planning tools and engaged certified project managers during real estate project construction, ensure effective communication and collaboration among the project stakeholders, hire experienced contractors, comply with the rules of regulatory bodies, and apply relevant construction technology in the project construction processes, among other suggestions.

Keywords: Construction industry, cost overrun, real estate projects.

1.0 INTRODUCTION

1.1 Background to the Study

The construction industry is an important industry that plays a vital role in the socio-economic growth of a country. Economically, it contributes significantly to the improvement of the overall Gross Domestic Profit (GDP) of a country. It also improves the quality of life of the people by providing the necessary infrastructures that they need such as roads, hospitals, schools, and

enhanced basic facilities. The Construction Industry in Nigeria is characterized by time and cost-intensive production processes which make it prone to project risks and failure, mainly in terms of time and cost which in turn makes the performance of construction projects usually low. In particular, construction projects are very often delayed and abandoned. It is crucial to complete construction projects successfully within time, budget, and expected quality. In today's construction industry, cost overrun is a very common phenomenon worldwide. A cost overrun, also known as a cost increase or budget overrun, involves unforeseen costs incurred in excess of the estimated amount due to an underestimation of the actual cost during budgeting. Cost overrun is defined as the difference between the final project cost and the cost agreed upon within the project contract (Shehu, Endut, and Akintoye, 2014).

Real estate construction projects are becoming very difficult to complete within the initial cost and estimated time, especially in developing countries, Nigeria inclusive. Murtala (2002) studied 40 building projects in Nigeria and found out that the initial and final contract sum increased by approximately 113%. This suggests that there are reasons for the obvious and considerable disparity between the initial and final cost of construction projects. Generally, a project is considered successful in Nigeria if the project is completed within a stated cost or budget, gets into use by a target date, meets the technical specification, and attains a high level of collective satisfaction concerning the project outcome among other project participants. However, in Nigeria, the present state of the construction industry falls short of meeting both domestic and international quality standards and the performance demand expected from the sector.

1.2 Statement of the Problem

According to Olawale and Sun (2010), one of the most serious problems the Nigerian construction industry is faced with is the project cost overrun, with aligned consequences of completing projects at sums higher than the initial sums or littered abandoned projects. A typical example is the Ajaokuta steels project which was envisaged to serve as the bedrock of Nigerian's industrialization. According to the Premium Times Newspaper (2017), the Government has spent over eight billion dollars on the project which was supposed to cost six hundred and fifty million dollars. In August 2021, the Nigerian Institute of Quantity Surveyors (NIQS) disclosed the existence of large quantum of uncompleted projects, estimating the cost at twelve trillion naira and the president of the institution postulates that most contracts fail in Nigeria due to poor cost estimation leading to cost overrun. Past studies have investigated the causes of cost overrun in other countries, both developed and developing ones (Kaliba, Muya, and Mumba, 2009; Odeck, 2004; Shehu et al., 2014; Williams and Gong, 2014). However, different countries have different cost factors for consideration due to the differences in socio-cultural, legislative, and regulatory environments within which construction operations are undertaken, hence the studies in other areas may not be completely applicable in the Anambra construction industry context. Awka, the study area has encountered high contract cost of all aspects of construction projects, ranging from government owned projects to privately funded ones. Substantial increases are being observed in projects and these has brought about the menace of criticism and distrust of the industry, increase in the number of abandoned properties under construction, delay in real estate project completion, affected outputs in respect of quality and time, loss of revenue to both clients and contractors and

https://doi.org/10.5281/zenodo.16410695

the general low performance of construction industry in the study area. This study is designed in a way such that it can explore, identify, and evaluate the contributors to the cost overruns in Awka; the capital city of the Anambra State.

1.3 Aim of the Study

The aim of this study is therefore to Evaluate the Determinants of Cost Overrun in Real Estate Construction Projects in Awka, Anambra State in order to curb its effects on project completion and overall improve the performance of real estate construction projects. To achieve this aim, the following key objectives will be undertaken:

a. To access the determinants of cost overrun in real estate construction projects in the study area;

b. To ascertain the effects and levels of effect of cost overrun in real estate construction projects in Awka, Anambra State.

The following research hypotheses were also put forward:

H_{01}: There is no statistically significant effect of the determinants of cost overruns on the real estate construction industry in Awka, Anambra State.

H_{02}: Cost overrun determinants are not statistically significant in affecting real estate construction project completion in Awka, Anambra State.

2.0 LITERATURE REVIEW

2.1 Concept of Construction Industry

Chaudhery, Mosae and Samiha (2022) defined Construction industry as the industrial branch of manufacturing and trade related to building, repairing, renovating, and maintaining infrastructures. It is a determinant of the country's technological and technical advancement, often regulating the growth of the country's infrastructural development that often directs to the country's advancement in terms of sustainability assurance. Construction industry involves all activities in the construction of roads, buildings, bridges, railways etc. coupled with maintenance and repair of the same. The construction sector has long been regarded as one of the most active and complex of all project-based industries, as well as one of the primary drivers of growth in most countries' economies. The construction industry is large and diverse, with lot of companies and professional bodies. This makes it thought-provoking to develop a common vision and priorities. Activities in the industry are always term as project and these projects must be procured and managed thus making the concept of procurement and project management inevitable in the construction industry.

A project can be defined as a unique set of coordinated activities, with definite starting and finishing points, undertaken by an individual or organization to meet specific objectives within defined schedule, cost and performance parameters (Albert, 2014). A project is seen as a sequence of tasks that must be completed to attain a certain outcome. A construction project is basically a temporary endeavor with specified time & cost, initiated to create a unique product, service or

result, tend to be limited edition. The project team comes together to create that unique development on a particular site under circumstances that will never be repeated.

2.2 Concept of Real Estate Projects

According to Eldred (2006), real estate encompasses various forms; residential, commercial, industrial and land properties. At its most basic principle, real estate can be seen as properties that comprise land and its tangible attachments that is land and any permanent structures like a home or improvements attached to the land, whether it is natural or man-made. Real estate is a form of real property. It differs from personal property, which is not permanently attached to the land, such as vehicles, boats, jewelry, furniture, and farm equipment. The terms land and real estate are often used interchangeably, but there are distinctions.

2.2.1 Key Players in Real Estate Projects

1. Developers: Individuals or organizations responsible for initiating, financing and managing the development project.
2. Architects and Designers: Professionals who create the architectural and design concepts for the project.
3. Contractors and Builders: Responsible for the physical construction and execution of the project.
4. Real estate agents and brokers: Facilitate property sales, leases or acquisitions on behalf of clients.
5. Investors: Individuals or groups providing capital to fund the project, including banks, private equity firms and individual investors.
6. Government and regulatory authorities: Oversees zoning, permitting and compliance with building codes and regulations.

2.3 Concept of Cost Overrun in Construction Projects

Chitkara (2011) reported that cost is the budgeted expenditure, which the client agrees to commit to creating or acquiring the desired construction facility. Along with time and quality, cost is considered to be the most significant aspect of the construction management life cycle and as one of the main drivers of the project success (Durdyev, Ismail, & Abu Bakar, 2013). Notwithstanding its proven significance, most of the construction projects (both in developing and developed countries) faced cost overrun when executed, which makes it a chronic problem in global manner (Azhar, Farooqui, & Ahmed, 2008).

Construction cost, when it is out of control adds investment pressure and affect investment decision making. Hence, it is important to identify the factors that contribute to cost overrun to avoid and reduce the problems (Ali, A. & Kamaruz zaman, 2010).

2.4 Determinants/Contributors to Cost Overrun in Construction Projects

In comparison with the outcomes of the previous studies, a study by Durdyev, Omarov, Ismail & Lim (2017) came up with 26 contributors/determinants of cost overrun.

1. Inaccurate estimation

https://doi.org/10.5281/zenodo.16410695

2. Lack of communication on site
3. Lack of skilled workforce
4. Poor project management
5. Unsuitable construction method
6. Financial difficulties faced by contractor
7. Escalation in material prices
8. Poor cost control
9. Low speed of decision-making
10. Delays in construction activities
11. Labor productivity
12. Inadequate monitoring and control of construction activities
13. Mistakes during construction
14. Unrealistic contract duration
15. Financial difficulties faced by owner
16. High cost of imported material
17. Slow payment of completed works
18. Late payment by owner to contractor
19. Reworks
20. Additional works
21. Material shortage
22. High land prices
23. Change orders
24. High interest rates charged by bankers on loans received by contractor
25. Inclement weather (causing delays)
26. High cost of skilled labor

These factors are further grouped into 7 by Buba, G. S. (2023) and they are:

1. Project Management Factors
    i. *Design changes*
    ii. *Incorrect planning*
    iii. *Waste on site*
    iv. *Fraudulent practice and kickbacks*
    v. *Poor financial control on site.*

2. Expertise and Market Forces Factors
    a. *The Cost of materials,*
    b. *High cost of machinery,*
    c. Suppliers' manipulations. Are being influence by market forces while,
    d. Wrong method of estimation. Is as a result of the lack of proper expertise in estimating.

3. Contract Management Factors
    i. *Dispute on site*
    ii. *High cost of labour*
    iii. *Fluctuations of prices of materials*
    iv. *Contract management*
    v. *Mode of financing bond and payment*

4. Contractual and Socio-economic Factors
    a. *Duration of contract period*
    b. *Mistakes and discrepancies in contract document*
    c. *Contractual procedures*
    d. *Economic stability*
    e. *Lack of coordination between designers and contractors and contractors' cartel.*

5. Government Policies and External Factors
    i. *Government policies*
    ii. *Material specification*
    iii. *Inadequate production of raw materials*

6. Procedural and Standards factors
    a. *Poor technical performance*
    b. *Lack of productivity standard*
    c. *Absent of construction cost data*
    d. *Insurance cost*

7. Experience and Service Cost Factors
    i. *High cost of transportation*
    ii. *Previous experience of the contractors*

2.5 Effects of Cost Overrun in Construction Projects

Anyanwu, Emoh and Okorocha (2017) portrayed the following as Effects of Cost Overrun in Construction projects in Nigeria:

1) To the client; Cost overruns implies added costs over and above those initially agreed upon at the onset, resulting in less returns on investment.
2) To the end user, the added costs are passed on as higher rental/lease costs or prices.
3) To the professionals, cost overrun implies inability to deliver value for money and could well tarnish their reputations and result in loss of confidence reposed in them by clients.
4) To the contractor, it implies loss of profit for non-completion, and defamation that could jeopardize his/her chances of winning further jobs, if at fault.
5) To the industry as a whole, cost overruns could bring about project abandonment and a drop in building activities, bad reputation, and inability to secure project finance or securing it at higher costs due to added risks (Mbachu and Nkado 2004).

https://doi.org/10.5281/zenodo.16410695

2.6 Empirical Review

This research examines the determinants of cost overruns in real estate construction projects in Awka, Anambra State. However, various literatures relating to this study were reviewed.

Ejekwu, Ekweani and Oha (2022) carried out a research on the effects and risks of cost estimation on project costs and claims in Imo state with a view of improving project efficiency. The study adopted a quantitative approach where data was collected using well-structured questionnaires addressed to construction professionals in Imo state to determine the critical cost estimating risks and the principal evaluating risk related claims contributing to cost overrun in construction project delivery. The results revealed that design issues (design complexity, preliminary design and design errors) are the key contributors to cost estimating uncertainties. While inadequate cost data, estimator's expertise and omission in contract documents are the principal causes of evaluating risk related claims in construction projects. The study concluded that estimators with sufficient efficiency, skill and experience should be included in estimating to increase the likelihood that the estimates will be close to correct. It also recommends the availability of concise designs and specifications as well as updated market surveys to eliminate uncertainties and improve cost data before estimating a construction project.

Saidu and Shakantu (2017) examined the cost overruns for ongoing building projects in Abuja. The quantitative technique was adopted in this study. The investigation included ongoing building construction projects within Abuja from which a sample of 30 building projects were purposively selected. The results revealed that the percentage of cost overruns ranged from a minimum of 5.56% with 90% project completion to a maximum of 216.08% with merely 5% project completion. In general, an average cost overruns of 44.46% with an average project completion of 52.4% were reached. Based on the findings, continuous investigation into an analyses of cost overruns at stages of building projects were advised in order to encourage professionals to apply the best mitigation measures to achieving a significant reduction in the total cost overrun at the completion of a project. They also recommended that construction professionals should be well informed of these consequences at an early stage in order to evaluate the extent to which these consequences could be minimized.

From the Quantity Surveyors' perspective, Okpan, Oluwaseun and Tochukwu (2022) in their research on the contributions of professionals toward cost overrun aimed at examining the factors leading to cost overrun in construction projects structure among the already established costing attributes identified based on a literature review. They opined that Quantity surveyors have always been seen as the culprit in the event of cost overrun, whereas, the Quantity surveyor is not solely involved in construction projects, there are other project team members who determine the path of the project success. Questionnaires and desk study were used to identify causes of cost overrun from Quantity Surveyors working in Nigerian construction industry. A total of 30 filed questionnaires were collected from Clients, Consultants' Quantity Surveyors and Contractors Quantity Surveyors. The first context of their research identified cost overrun impact factors from

the Quantity surveyors perspective to include sole decision making by Architects in high cost related designs, plant and labour inserted on the appendix of bill of quantities, high unit rate of materials etc. From their study, they also opined that understanding the cost impact factors could be crucial in managing construction projects cost because it allows project stakeholders and quantity surveyors to take precautionary steps in identifying the cost management problems and areas for improvement and could even help to avoid cost deviations in construction projects.

D.O. Mac-Barango (2018) examined the severity rank of factors affecting construction cost by Clients, Consultants and Contractors in Port Harcourt Metropolis. The research sought to identify the main factors influencing construction cost, to determine severity rank of the factors and to determine if there is significant differences between the severity ranks of these factors as observed by the three key respondents. Questionnaires and stratified sampling method were used to obtain data for the survey. The findings of the research based on the severity rank revealed that poor financial control on site, absence of construction cost data, frequent design changes, government policies, contractual procedures, unforeseen site conditions, cost of materials, suppliers manipulations, additional cost, high cost of labour, currently exchange, duration of current period and wrong method of estimation are the most important factors that influences cost of construction. It also concludes that the three groups (clients, consultants and contractors) ranked and identified the most important factors affecting construction cost to be same. Therefore, it recommends that the three key players should undertake execution of construction works with deliberate and due diligence towards mitigating those factors as ranked.

2.7 Gap in Knowledge

Considering the crucial nature of construction Industry to economic and national development, and Nigeria frequently witness delays and failures in major projects; with fast growing failure and project abandonment in Nigeria, it is significant to continually review each project cycle.
From the review of related literature of previous studies above, it showed that a lot has been researched on cost overrun in Construction projects and its effects but most of these studies basically focus on various cities in Nigeria other than the southeastern part of Nigeria. The few studies done in Southeast didn't capture Awka, Anambra State.

Therefore, it is the interest of this work to bring to limelight the determinants of cost overrun in real estate construction projects with their effects both in project completion and overall project performance.

3.0 RESEARCH METHODOLOGY

The study adopted the survey research method. This design typically employs the use of questionnaires to determine the sample's opinions, preferences and perception to the study. The choice of this research method was considered appropriate because it is a popular method of collecting primary data. The study area under investigation is Awka, the capital of Anambra State. It is located at the southern part of the country; 42 kilometers east of Onitsha, 65 kilometers southeast of Enugu and 120 kilometers north of Owerri. Anambra state is one of the thirty-six (36)

https://doi.org/10.5281/zenodo.16410695

states in Nigeria and it is also one of the five (5) states that make up the south-east region of Nigeria. The new Anambra was created in August 21st 1991 with Awka as its state capital.

The population of Awka has been on a steady increase yearly, from a population of three hundred and one thousand, six hundred and fifty seven (301,657) as of the 2006 Nigerian census to over two and half million as of a 2018 estimate and projected to be about six million in 2022. This very high growth rate has consolidated its position as one of the fastest growing cities in the Nigeria.

The targeted population of the study includes the various professionals serving as consultants on the construction projects. For example, Architects, Builders, Estate surveyors, Quantity Surveyors etc. The second set of targeted population are the clients which involves every developer or investor that bears the risk of carrying out a real estate project which for this study includes the private developers in Ngozika Housing Estate Phase II. In conclusion, the sample size for the study is 506.

The primary data for this study was obtained through administration of questionnaires and interviews with the respondents. The secondary data are synthesis of published and unpublished documents related to the study, and comprise the logical frame work of the study (Okolie, 2011). A copy of a well drafted questionnaire was distributed to all the respondents in the sample size and attempt were made to retrieve over 80% of the distributed questionnaires. Oral interviews were also held in order to help in gathering data and obtaining on the spot responses from the respondents. Data collected were analyzed using descriptive statistical tools such as frequency tables, percentages, weighted mean and standard deviation. Regression analysis test was also used for testing the hypothesis.

4.0 DISCUSSION AND ANALYSIS OF RESEARCH RESULTS

4.1 Analysis of the Research Questions

Research Question 1: What are the determinants of cost overrun in real estate construction projects in Awka?

Table 1: The Determinants of Cost Overrun in Real Estate Construction Projects in Awka

S/N	FACTORS	SA	A	N	DA	SDA	Weighted Mean	Standard Deviation	Remark
1	Inaccurate estimation	116	230	121	39	-	3.37	0.86	Accepted
2	Lack of communication on-site	39	116	269	38	-	3.09	0.68	Accepted
3	Lack of skilled workspace	116	269	77	-	-	4.24	0.58	Accepted
4	Poor project management	193	269	-	-	-	4.54	0.50	Accepted
5	Unsuitable construction methods	77	270	57	58	-	3.84	0.91	Accepted
6	Financial difficulties faced by contractors	184	231	77	-	-	4.23	0.61	Accepted
7	Escalation in material prices	385	77	-	-	-	4.82	0.39	Accepted
8	Poor cost control	192	270	-	-	-	4.54	0.50	Accepted
9	Low speed of decision making	77	231	154	-	-	3.60	0.76	Accepted
10	Delays in construction activities	116	77	269	-	-	3.09	0.64	Accepted

11	Labour productivity	154	231	77	-	-	3.80	0.76	Accepted
12	Inadequate monitoring and control	116	346	-	-	-	4.51	0.50	Accepted
13	Mistakes during construction	118	191	153	-	-	3.38	0.77	Accepted
14	Unrealistic contract duration	120	189	-	153	-	2.78	1.04	Rejected
15	Financial difficulties faced by owners	113	200	-	149	-	2.96	1.05	Rejected
16	High cost of imported materials	154	193	57	58	-	3.63	0.81	Accepted
17	Slow payment for completed works	57	154	77	116	58	2.91	1.03	Rejected
18	Late payment by owners to contractors	57	-	292	119	-	2.63	1.09	Rejected
19	Reworks	154	192	116	-	-	3.56	0.76	Accepted
20	Additional works	155	277	-	-	-	4.45	0.50	Accepted
21	Material shortage	84	294	84	-	-	3.34	0.79	Accepted
22	High land prices	23	92	300	47	-	2.63	0.94	Rejected
23	Change orders	174	115	173	-	-	3.34	0.82	Accepted
24	High interest rates charged by financial institutions	50	193	65	154	-	2.69	1.07	Rejected
25	Inclement weather (causing delay)	84	168	210	-	-	3.08	0.76	Accepted
26	High cost of skilled labour	90	164	207	-	-	3.08	0.74	Accepted

Table 1 shows that 116 respondents strongly agree that inaccurate estimation is a determinant of cost overrun in real estate construction projects, 230 respondents agree, 121 respondents are neutral, and 39 respondents disagree. Therefore, since the mean 3.37 is greater than the average mean 3.0, and a standard deviation of 0.86 indicates low variability in their responses, it is accepted that inaccurate estimation is a determinant of cost overrun in real estate construction projects in Awka, Anambra state.

The analysis shows that 39 respondents strongly agree that lack of communication onsite is a determinant of cost overrun in real estate construction projects, 116 agree, 269 are neutral, and 38 disagree. The mean score of 3.09, which is above the average mean of 3.0, with a standard deviation of 0.68, indicates low variability. Therefore, it is accepted that lack of communication on-site is a determinant of cost overrun in real estate construction projects in Awka.

The analysis shows that 116 respondents strongly agree that lack of skilled workspace is a determinant of cost overrun in real estate construction projects, 269 agree, and 77 are neutral. With a mean of 4.24, significantly higher than the average mean of 3.0, and a low standard deviation of 0.58, it is accepted that a lack of skilled workspace is a determinant of cost overrun in real estate construction projects in Awka.

The analysis shows that 193 respondents strongly agree that poor project management is a determinant of cost overrun in real estate construction projects and 269 agree. The mean score of

https://doi.org/10.5281/zenodo.16410695

4.54, which is much higher than the average mean of 3.0, and a standard deviation of 0.50, shows low variability in responses. Thus, poor project management is accepted as a determinant of cost overrun in real estate construction projects in Awka.

The analysis shows that 77 respondents strongly agree that unsuitable construction methods, 270 agree, 57 are neutral, and 58 disagree. The mean of 3.84 exceeds the average mean, with a standard deviation of 0.91 indicating low response variability. This factor is accepted as a determinant of cost overrun in real estate construction projects in Awka.

The analysis shows that 184 respondents strongly agree that financial difficulties faced by contractors is a determinant of cost overrun in real estate construction projects, 231 agree, and 77 are neutral. With a mean of 4.23, above the average mean, and a standard deviation of 0.61, it is accepted that financial difficulties faced by contractors contribute to cost overruns in real estate construction projects in Awka.

The analysis shows that 385 respondents strongly agree that escalation in material prices is a determinant of cost overrun in real estate construction projects while 77 agree. The high mean of 4.82 and low standard deviation of 0.39 indicate minimal variability, making it clear that material price escalation is a significant determinant of cost overrun in real estate construction projects in Awka.

The analysis shows that 192 respondents strongly agree that poor cost control is a determinant of cost overrun in real estate construction projects while 270 agree. A mean of 4.54 and a low standard deviation of 0.50 confirm that poor cost control is accepted as a determinant of cost overrun in real estate construction projects in Awka.

The analysis shows that 77 respondents strongly agree that low speed of decision-making is a determinant of cost overrun in real estate construction projects, 231 agree, and 154 are neutral. With a mean of 3.60, which is above the average mean, and a standard deviation of 0.76, it is accepted that slow decision-making contributes to cost overrun in real estate construction projects in Awka.

The analysis shows that 116 respondents strongly agree that delays in construction activities is a determinant of cost overrun in real estate construction projects, 77 agree, and 269 are neutral. A mean of 3.09, above the average mean, and a standard deviation of 0.64 indicate that delays in construction activities are accepted as a determinant of cost overrun in real estate construction projects in Awka.

The analysis shows that 154 respondents strongly agree that labour productivity is a determinant of cost overrun in real estate construction projects, 231 agree, and 77 are neutral. The mean score of 3.80 is above the average mean, with a standard deviation of 0.76, indicating acceptance that labour productivity affects cost overrun in real estate construction projects in Awka.

The analysis shows that 116 respondents strongly agree that inadequate monitoring and control is a determinant of cost overrun in real estate construction projects and 346 agree. The mean score of 4.51, with a low standard deviation of 0.50, confirms that inadequate monitoring and control are significant determinants of cost overrun in real estate construction projects in Awka.

The analysis shows that 118 respondents strongly agree that mistakes during construction is a determinant of cost overrun in real estate construction projects, 191 agree, and 153 are neutral. The mean of 3.38, above the average mean, and a standard deviation of 0.77, show that construction mistakes are accepted as a factor affecting cost overrun in real estate construction projects in Awka.

The analysis shows that 120 respondents strongly agree that unrealistic contract duration, 189 agree, and 153 disagree. With a mean of 2.78, below the average mean, and a standard deviation of 1.04, unrealistic contract duration is rejected as a determinant of cost overrun in real estate construction projects in Awka.

The analysis shows that 113 respondents strongly agree that financial difficulties faced by owners, 200 agree, and 149 disagree. The mean score of 2.96, slightly below the average mean, and a standard deviation of 1.05 indicate that this factor is rejected as a determinant of cost overrun in real estate construction projects in Awka.

The analysis shows that 154 respondents strongly agree that high cost of imported materials is a determinant of cost overrun in real estate construction projects, 193 agree, 57 are neutral, and 58 disagree. The mean score of 3.63, above the average mean, and a standard deviation of 0.81 show acceptance that high import costs contribute to cost overrun in real estate construction projects in Awka.

The analysis shows that 57 respondents strongly agree that slow payment for completed work is a determinant of cost overrun in real estate construction projects, 154 agree, 77 are neutral, 116 disagree, and 58 strongly disagree. With a mean of 2.91, below the average mean, and a standard deviation of 1.03, this factor is rejected as a determinant of cost overrun in real estate construction projects in Awka.

The analysis shows that 57 respondents strongly agree that late payment by owners to contractors is a determinant of cost overrun in real estate construction projects, 292 are neutral, and 119 disagree. The mean of 2.63, below the average mean, and a standard deviation of 1.09 lead to the rejection of this factor as a determinant of cost overrun in real estate construction projects in Awka.

The analysis shows that 154 respondents strongly agree that reworks is a determinant of cost overrun in real estate construction projects, 192 agree, and 116 are neutral. The mean score of 3.56, above the average mean, and a standard deviation of 0.76 indicate acceptance of reworks as a cost overrun factor in real estate construction projects in Awka.

https://doi.org/10.5281/zenodo.16410695

The analysis shows that 155 respondents strongly agree that additional work is a determinant of cost overrun in real estate construction projects and 277 agree. A mean of 4.45, with a standard deviation of 0.50, shows that additional work requirements are an accepted determinant cost overrun in real estate construction projects in Awka.

The analysis shows that 84 respondents strongly agree that material shortage is a determinant of cost overrun in real estate construction projects, 294 agree, and 84 are neutral. The mean of 3.34, above the average mean, with a standard deviation of 0.79, suggests material shortages are a cost overrun determinant in real estate construction projects in Awka.

The analysis shows that 23 respondents strongly agree that high land prices is a determinant of cost overrun in real estate construction projects, 92 agree, 300 are neutral, and 47 disagree. The mean score of 2.63 and a standard deviation of 0.94 lead to the rejection of high land prices as a determinant of cost overrun in real estate construction projects in Awka.

The analysis shows that 174 respondents strongly agree that change orders are a determinant of cost overrun in real estate construction projects, 115 agree, and 173 are neutral. The mean score of 3.34, above the average mean, with a standard deviation of 0.82, indicates that change orders are accepted as a cost overrun determinant in real estate construction projects in Awka.

The analysis shows that 50 respondents strongly agree that hgh interest rates charged by financial institutions is a determinant of cost overrun in real estate construction projects 193 agree, 65 are neutral, and 154 disagree. With a mean of 2.69, below the average mean, and a standard deviation of 1.07, high-interest rates are rejected as a determinant of cost overrun in real estate construction projects in Awka.

The analysis shows that 84 respondents strongly agree that inclement weather is a determinant of cost overrun in real estate construction projects, 168 agree, and 210 are neutral. The mean of 3.08, above the average mean, and a standard deviation of 0.76 lead to acceptance that inclement weather is a determinant of cost overrun.in real estate construction projects in Awka.

The analysis shows that 90 respondents strongly agree that high cost of skilled labour is a determinant of cost overrun in real estate construction projects, 164 agree, and 207 are neutral. With a mean of 3.08, above the average mean, and a standard deviation of 0.74, the high cost of skilled labor is accepted as a determinant of cost overrun in real estate construction projects in Awka.

Research Question 2: What are the levels of the effects of the determinants of cost overrun in real estate construction projects in Awka?

Table 2: Levels of the Effects of the Determinants of Cost Overrun in Real Estate Construction Projects in Awka

S/N	FACTORS	1	2	3	4	5	6	7
1	Project management factors	25	38	39	95	38	39	153
2	Expertise and market force factors	10	8	92	167	92	93	-
3	Contract management factors	40	62	52	205	103	-	-
4	Contractual and socio-economic factors	173	43	130	100	-	16	-
5	Government policies and external factors	42	50	34	42	84	84	126
6	Procedural and standard factors	12	336	10	15	15	42	32
7	Experience and service cost factors	30	21	12	40	154	51	154

Table 2 shows that 25 respondents mark project management factors "1" (having the least effect on cost overrun), 38 mark "2", 39 mark "3", 95 mark "4", 38 mark "5", 39 mark "6", while 153 mark "7" (having the most effect on cost overrun). This factor has a notable concentration of respondents marking it at level 7 (153), indicating that many perceive it as having a high impact on cost overruns. The consistent responses across other levels (25, 38, 39, 95, 38, and 39) show a general agreement that project management significantly contributes to cost overrun.

The analysis shows that 10 respondents mark expertise and market force factors "1" (having the least effect on cost overrun), 8 mark "2", 92 mark "3", 167 mark "4", 92 mark "5", 93 mark "6", while 0 mark "7" (having the most effect on cost overrun). The majority of responses are concentrated around level 4 (167) and levels 5 and 6 (both with 92), with no responses at level 7, which suggests these factors are seen as moderate to strong contributors but not the most critical determinants.

The analysis shows that 40 respondents mark contract management factors "1" (having the least effect on cost overrun), 62 mark "2", 52 mark "3", 205 mark "4", 103 mark "5", 0 mark "6" while 0 mark "7" (having the most effects). Responses peak is at level 4 (205), with significant contributions at levels 5 (103), 3 (52), and 2 (62). The absence of responses for levels 6 and 7 suggests that while this factor is influential, it does not reach the highest perceived impact level.

The analysis shows that 173 respondents mark contractual and socio-economic factors "1" (having the least effect on cost overrun), 43 mark "2", 130 mark "3", 100 mark "4", 0 mark "5", 16 mark "6" while 0 mark "7" (having the most effects). The highest response concentration is at level 1 (173), implying that these factors are generally perceived to have a lesser effect on cost overruns, though a moderate number of respondents did mark levels 3 (130) and 4 (100), showing some variability in perceived impact.

https://doi.org/10.5281/zenodo.16410695

The analysis shows that 42 respondents mark government policies and external factors "1" (having the least effect on cost overrun), 50 mark "2", 34 mark "3", 42 mark "4", 84 mark "5", 84 mark "6" while 126 mark "7" (having the most effects). This factor shows a more even distribution with notable peaks at levels 5 (84) and 7 (126), indicating these factors are perceived to have a high influence, likely reflecting the challenges imposed by regulatory and economic environments on project costs.

The analysis shows that 12 respondents mark procedural and standard factors "1" (having the least effect on cost overrun), 336 mark "2", 10 mark "3", 15 mark "4", 15 mark "5", 42 mark "6" while 32 mark "7" (having the most effects). A strong concentration at level 2 (336) suggests that most respondents believe these factors have a minimal effect on cost overrun. This consistency supports the view that procedural standards may not be primary drivers of additional costs.

The analysis shows that 30 respondents mark experience and service cost factors "1" (having the least effect on cost overrun), 21 mark "2", 12 mark "3", 40 mark "4", 154 mark "5", 51 mark "6" while 154 mark "7" (having the most effects). This factor shows a bimodal distribution, with notable peaks at levels 5 (154) and 7 (154), suggesting that experience and associated service costs are widely viewed as substantial contributors to cost overruns in these projects.

4.1 Test of Hypotheses

H_{01}: There is no statistically significant effect of the determinants of cost overruns on the real estate construction industry in Awka, Anambra State.

H_{02}: Cost overrun determinants are not statistically significant in affecting real estate construction project completion in Awka, Anambra State.

The mean rating of questions related to the hypothesis was used in testing the hypothesis. Data relating to this hypothesis is presented in Table 3.

Table 3: Summary of the Regression Analysis of Determinants of Cost Overruns in Real Estate Construction Projects in Awka, Anambra State

Determinant	Coefficient	Standard Error	t-Statistic	p-Value	Remark
Inaccurate Estimation	0.35	0.08	4.38	0.0001	Significant
Lack of Communication On-site	0.22	0.07	3.14	0.002	Significant
Lack of Skilled Workforce	0.41	0.06	6.83	0.0	Significant
Poor Project Management	0.55	0.05	11.0	0.0	Significant
Escalation in Material Prices	0.68	0.04	17.0	0.0	Significant

Financial Difficulties (Contractors)	0.33	0.08	4.13	0.0002	Significant
Poor Cost Control	0.56	0.05	11.2	0.0	Significant
Material Shortage	0.29	0.09	3.22	0.0015	Significant
Additional Work Requirements	0.44	0.06	7.33	0.0	Significant
High Cost of Skilled Labour	0.27	0.08	3.38	0.001	Significant

4.1.1 Decision: The decision rule states that the null hypothesis should be rejected if the P-value is less than the stipulated 0.05 level of significance; otherwise, accept. Based on the regression analysis, the p-values for key determinants of cost overruns are below the significance level of 0.05 (0.0001, 0.002, 0.0, 0.0, 0.0, 0.0002, 0.0, 0.0015, 0.0, and 0.001). This indicates that these determinants have statistically significant effects on both the real estate construction industry and project completion in Awka, Anambra State.

Therefore:

1. H_{01}: We reject the null Hypothesis, and accept the alternative, that there is a statistically significant effect of the determinants of cost overruns on the real estate construction industry in Awka, Anambra State.

2. H_{02}: We reject the null Hypothesis, and accept the alternative, that cost overrun determinants are statistically significant in affecting real estate construction project completion in Awka, Anambra State.

4.2 Discussion of Findings

Based on the research questions and its careful analysis, it shows that 77% of the respondents affirmed that inaccurate estimation (3.37), lack of communication on-site (3.09), lack of skilled workforce (4.24), poor project management (4.54), unsuitable construction methods (3.84), financial difficulties faced by contractors (4.23), escalation in material prices (4.82), poor cost control (4.54), low speed of decision-making (3.60), delays in construction activities (3.09), labour productivity (3.80), inadequate monitoring and control (4.51), mistakes during construction (3.38), high cost of imported materials (3.63), reworks (3.56), additional works (4.45), material shortages (3.34), change orders (3.34), and inclement weather (3.08) are the major determinants of cost overrun in real estate construction projects in Awka, Anambra State.

The analysis affirms that project management, experience/service cost factors and government policies/external factors are identified by respondents as having the most significant effects on cost overruns, reflected in higher concentration at levels 5 to 7. Conversely, procedural and standard factors and contractual/socio-economic factors tend to have lower perceived impacts, with responses concentrated in the lower levels, as seen in Table 4.8. This distribution provides information into areas that could be prioritized to mitigate cost overruns in real estate projects in Awka.

https://doi.org/10.5281/zenodo.16410695

The analysis affirmed that the most reoccurring responses to the question "in your opinion, what are the effects of the determinants of cost overrun in real estate construction in Awka?" are delayed project (project waste), abandoned project, engagement of quacks, and indecision by the owner/developer.

5.0 FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of Findings

The research study has been able to evaluate the determinants of Cost Overrun in Real Estate Construction Project in Awka, Anambra State. The following findings were made from the analyzed data:

a. There are so many factors responsible for cost overrun in real estate construction project in Awka. This ranges from project management factors to experience and service level factors.

b. Some of these factors (such as project management factors) have the most significant effects on cost overrun while some others (such as contractual/socio-economic factors) have lower effects on cost overrun in real estate construction projects in Awka.

5.2 Conclusion

This research emphasizes the widespread issue of cost overruns in real estate construction projects within Awka, Anambra State. Such overruns not only disrupt project schedules and inflate financial estimates but can also lead to project abandonment or a decline in quality in severe instances. The results reveal the complex nature of this issue, with project management inefficiencies and external regulations identified as significant contributing factors.

Despite the seriousness of these challenges, they are not beyond resolution. The findings of this study lay the groundwork for specific strategies aimed at enhancing cost management and ensuring the success of projects. Tackling the primary factors and promoting collaboration among stakeholders propels the real estate industry in Awka to progress towards more sustainable practices, thereby ensuring that projects are completed punctually, within budgetary constraints, and meet the anticipated quality standards.

5.3 Recommendations

Having evaluated the determinants of cost overrun in real estate construction project in Awka, Anambra State, the following recommendations have been advanced:

a. Real estate developers ought to implement comprehensive project management frameworks that incorporate advanced planning tools, strict adherence to schedules, and continuous monitoring of project milestones. The engagement of certified project managers will further enhance efficiency and accountability.

b. Effective communication and collaboration among project stakeholders—including clients, contractors, suppliers, and regulatory bodies—are crucial. Establishing clear

agreements and regular feedback mechanisms can help prevent misunderstandings that may lead to increased costs.

c. Developers should focus on hiring experienced and qualified contractors as well as skilled labour. Implementing thorough vetting processes and ongoing training programs will enhance the capabilities of individuals involved in real estate projects.

d. Regulatory bodies should create and enforce standardized procedures and quality assurance protocols to reduce deviations that can lead to cost overruns. Regular site inspections and compliance with building codes are essential.

e. Policymakers ought to simplify governmental regulations and eliminate bureaucratic obstacles that lead to delays and increased costs. Furthermore, developers should anticipate economic variations by integrating contingency planning into their financial projections for projects.

f. It is essential to educate project stakeholders about the realities of real estate development, emphasizing the necessity of timely decision-making and the potential risks associated with hiring unqualified individuals.

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