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Contractors' Selection Criteria and Construction Project Outcome in Rivers State

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Abstract: The building industry plays a leading role in the macroeconomic development of sovereign states, particularly in the provision of essential infrastructure such as bridges, motorways, and other structures that underpin commercial activity. However, the same sector in emerging economies often struggles to deliver projects that fully meet planned performance targets, largely due to inadequate contractor selection procedures. This paper examined the relationship between contractor selection standards and construction project performance outcomes. The survey tool consisted of 29 items on a five-point Likert scale and was administered to 132 officers of the Rivers State Universal Basic Education Board (RSUBEB). Data analysis was conducted using descriptive statistics and Pearson correlation analysis with SPSS V.23. The results revealed a strong positive relationship ($r = 0.846$; $p = 0.000$) between the rigor of contractor selection requirements and positive project results. Based on that, the research proposes that standardized evaluation metrics that emphasize financial soundness, technical skills, prior experience, and resource availability should be prioritized as key factors associated with improved construction project performance.

Keywords: Construction Cost, Construction Projects, Contractors, Economic Development, Selection Strategies.

1 Introduction

The construction industry is a key driver of economic growth in any given country, especially in emerging economies, where it significantly impacts infrastructure, employment, and overall economic activity. Poor contractor selection practices have been known to affect the successful execution of construction projects in developing countries. Contractors' performance is critical to the timely and cost-effective delivery of projects. Thus, contractor selection is not only significant for meeting a project's technical needs but also for delivering the desired results in terms of cost, quality, time, and safety. Although contractor selection frameworks are well-established in many developed construction markets, in most developing countries, particularly in Nigeria, the practice remains inconsistent. It often lacks a clearly defined framework to enhance project success. Existing literature highlights the importance of contractor selection but provides limited empirical insight into the relative importance of specific criteria within the Rivers State context. This research seeks to address that gap by examining the relationship between contractor selection criteria and construction project outcomes in Rivers State, with a focus on the relevance of specific contractor selection strategies.

Much literature has been written on the criteria of contractor selection in various regions and settings. Research by G.D. Holt et al. [1] and O. Alptekin and N. Alptekin [2] highlights the role of financial soundness, experience, and managerial abilities in project success. Nevertheless, although these studies present general selection criteria, they do not consider the specific issues that the Nigerian construction industry, especially in Rivers State, faces. The low-bidder culture and poor knowledge of the socio-economic factors affecting contractors' performance remain major obstacles. Therefore, although the existing literature can be valuable, it lacks a thorough examination of contractor selection strategies in Rivers State, indicating that research on local practices should be pursued further.

Additional studies, including those by M. Salama et al. [3], indicate that financial stability and technical expertise are the most important criteria for selecting contractors. Nevertheless, these criteria have not been extensively applied in construction projects in Nigeria. Multi-criteria decision-making (MCDM) methods have become popular for selecting contractors worldwide, yet their application in Rivers State has not been studied in detail. Consequently, the literature gap stems from the absence of an analytical framework to assess the combination of criteria that best predict the successful delivery of construction projects in the region. The current research will help fill this gap by evaluating contractor selection strategies in the local setting, particularly the impact of these criteria on project outcomes.

Also, the available literature, such as I. Rashid et al. [4] and A. R. Khoso and A. M. Yusof [5], indicates that health and safety, experience, and resource availability play a major role in the contractor selection process. Nevertheless, such studies do not usually reflect the regional differences that influence the construction sector worldwide, particularly in developing economies such as Nigeria. The lack of research on the effects of health and safety performance and resource availability in Rivers State indicates a knowledge gap regarding how these factors can contribute to the successful implementation of construction projects. This gap has led to the current study, which seeks to assess how these factors, when considered in contractor selection, can enhance project outcomes. Finally, other researchers, such as S.A. Tarawneh [6] and M.M. Marzouk et al. [7], note that prior project experience and technical capacity are important factors in contractor selection. Nonetheless, the implementation of these criteria in the large-scale projects in Rivers State has a gap.

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The studies have largely concentrated on small to medium-scale projects, and there is a gap in the literature regarding the dynamics of contractor selection in large and more complex projects. This gap requires a study that specifically examines the peculiarities of Rivers State and how the combination of contractor selection criteria can optimise project delivery in large-scale construction, enhancing quality, cost management, and delivery time.

Although past research has provided useful information on the contractor selection process, there remains a significant gap in understanding how these criteria apply to the construction sector in Rivers State, Nigeria. This study will address these gaps by establishing the connection between contractor selection criteria and project outcomes. It will help to develop more efficient and context-specific approaches to contractor selection. The results of this study will not only make construction projects in Rivers State more efficient but also serve as an example for other regions of Nigeria and even elsewhere.

1.1. Objectives of the Study

The study aims to examine the relationship between the contractors' selection criteria and construction project outcome in Rivers State. Specifically, the study seeks to:

1. Assess the major contractors' selection criteria that impact construction project outcomes.
2. Determine the benefits of contractors' selection criteria on construction project outcomes.

1.2. Hypothesis

Ho1: There is no significant relationship between Contractors' selection criteria and construction project outcomes.

Contractors' selection criteria, including competence, financial soundness, experience, and health and safety performance, are associated with construction project outcomes. These criteria are associated with key project outcomes, including quality, cost, time, and safety. The framework emphasizes that a thorough evaluation and selection process is critical to achieving successful project outcomes. Successful project outcomes may reinforce the perceived importance of selecting the appropriate contractor in future projects. The framework underscores the significance of choosing the right contractor to support improved project performance.

1.3. Contractor's Selection Criteria: Independent Variable

The independent variables relating to selection criteria are given below.

i) Competence and Knowledge: Competence and knowledge refer to a contractor's ability to perform the required tasks based on technical expertise, industry experience, and a strong understanding of the project needs. Contractors with advanced knowledge and skills can deliver high-quality projects while meeting deadlines. Studies show that competence enhances project outcomes by reducing errors and increasing efficiency [2]. A competent contractor increases the likelihood of timely completion and minimizes the risk of project delays and cost overruns [8].

ii) Financial Soundness: Financial soundness evaluates a contractor's financial capacity to handle the project's budget, purchase materials, and manage cash flow. A financially stable contractor is essential to avoid project delays caused by financial instability, such as cash shortages or bankruptcies. Contractors with solid financial standing are more likely to deliver the project within budget and reduce the risk of cost overruns [5]. Financial soundness also ensures smooth project execution by securing the necessary resources and investments.

iii) Experience and Track Record: Experience and track record refer to a contractor's history of completing projects similar to the one at hand. A contractor with relevant experience is more likely to anticipate challenges, provide innovative solutions, and manage resources effectively. Previous performance in similar projects is widely regarded as an important indicator of potential project success, as it reflects the contractor's capability to meet the project's quality, cost, and timeline expectations [7]. An established track record boosts client confidence and project success.

iv) Managerial Capability: Managerial capability refers to a contractor's ability to oversee, organize, and coordinate the various aspects of a project, including scheduling, budgeting, and workforce management. Effective project management ensures that the project progresses smoothly and any issues are addressed promptly. Contractors with strong managerial skills contribute to the efficient use of resources and better communication, reducing the likelihood of project delays or inefficiencies [3]. Good management leads to effective collaboration, minimizing disputes and ensuring timely project completion.

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v) Health and Safety Performance: Health and safety performance is critical to ensure that construction projects are carried out in compliance with safety regulations and standards. Contractors with strong safety records minimize the risk of accidents and injuries, promoting a safe working environment. Good safety performance reduces delays, legal issues, and insurance costs, contributing to a more efficient project execution [9]. Prioritizing safety helps to protect workers and maintain a positive reputation for contractors and clients alike.

vi) Resource Availability: Resource availability assesses whether a contractor has the necessary materials, equipment, and workforce to execute a project. Adequate resource availability is essential to avoid delays caused by shortages or insufficient capacity. Contractors with access to high-quality materials and skilled labor are more likely to meet project objectives for quality, time, and cost. Resource availability also impacts the contractor's ability to scale the workforce as needed to meet deadlines [2].

vii) Competitive Bid Price: Competitive bid price refers to the cost proposal submitted by contractors during the bidding process. While price is an important factor, it should not be the sole criterion for selecting a contractor. A low bid price may indicate poor quality or inadequate resources, leading to higher costs in the long run due to rework or delays. A competitive bid price ensures that the contractor delivers value for money while still meeting quality standards within budget [1].

1.4. Construction Project Outcomes: Dependent Variables

The dependent variables relating to selection criteria are given below.

i) Project Quality: Project quality refers to how well the construction project meets the required specifications, standards, and client expectations. It involves materials, workmanship, and adherence to design and safety guidelines. High-quality outcomes are ensured when contractors are selected based on competence, experience, and a track record of delivering projects with superior standards. Studies indicate that effective contractor selection criteria, such as technical ability and past performance, directly correlate with improved project quality [7][5].

ii) Project Cost: Project cost involves managing the financial resources to meet the project's budgetary constraints. A contractor's financial soundness and resource management capabilities directly affect a project's cost control and cost-effectiveness. Contractors with a robust financial track record and the ability to deliver projects within budget are crucial for minimizing cost overruns. Research indicates that proper contractor selection, using financial stability as a criterion, helps manage costs effectively and reduces the risk of financial mismanagement [2][1].

iii) Project Time: Project time refers to the ability of the contractor to meet deadlines and deliver the project within the specified timeframe. Effective contractor selection can mitigate schedule delays by ensuring contractors have adequate resources and experience to handle the project scope. Past performance in meeting deadlines and managerial capability are key factors influencing timely project completion. Studies highlight that contractors with a proven track record in time management contribute to faster project execution [3][2].

iv) Project Safety: Project safety encompasses the measures taken to ensure that the worksite adheres to health and safety standards, preventing accidents and ensuring the well-being of workers. Safety performance is a critical outcome influenced by contractor selection, especially those with strong safety records and adherence to safety protocols. Contractors with robust health and safety performance reduce risks associated with injuries and accidents, which in turn, positively impact the overall success and efficiency of the project [9][4].

1.5. Contributions of the Study

This study contributes to the literature by providing context-specific empirical evidence on contractor selection criteria and their association with construction project outcomes in Rivers State, Nigeria. It synthesizes key selection criteria and perceived benefits using practitioner-based data and adopts a multi-criteria decision-making perspective to support transparent contractor evaluation. The study also offers practical insights for public-sector project stakeholders while acknowledging its methodological limitations.

2 Literature Review

2.1. Contractor Selection Criteria

Contractor selection and evaluation have been conceptualized as one of numerous complex tasks due to their ambiguity and difficult formalization [10][11].

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Contractors' selection is based on criteria used to assess and evaluate bids and the Contractor's suitability. Contractor selection criteria refer to the factors to consider when choosing among alternatives and selecting which contractors to use to meet the owner's project objectives. The requirements adopted during the contractor selection process may vary depending on the project's characteristics [12][13].

Several studies in the literature have identified factors and criteria for assessing and selecting appropriate contractors for construction projects [14]. The use of the lowest bid price is common but is counterproductive in the industry. G. Holt, P.O. Olomolaiye and F.C. Harris stressed the need to avoid automatic selection based solely on the lowest bid price and the practice of automatically selecting the lowest bidder instead of the most optimal [15]. Choosing the lowest bidder by clients often leads to award of construction contracts to incompetent, unqualified, inexperienced and inadequately financed contractors [16]. Similarly, an inappropriate selection of contractors could lead to severe extra costs that result from rework which emanate from poor quality work, abandonment, claims, bankruptcy, disputes, among others [17]. A.R. Khoso and A.M. Yusof opine that researchers do agree that the major selection criteria for contractors include previous experience, capability and performance of employees, financial reliability and soundness, safety, firm's reputation, quality, capability of equipment, technology, local information available, current workload and backlog, contractors' accessibility, time and cost performance in previous projects, and among others [5].

According to M.M. Marzouk, A.A. El- Kherbawy and M. Khalifa who surveyed 29 construction experts in Egypt, found that the top twelve significant factors that influence sub-contractors selection in construction projects are; flexibility and cooperation when resolving delays, reputation, delay, failure to comply with the quality specifications, quality, suppliers incompetency to deliver materials on time, failure to complete the contract, physical resources, tender price, contractor's difficulty in reimbursement, flexibility in critical activities and safety consciousness on the job site [7]. Similarly, in Egypt, M. Salama et al. state that the main criteria for the pre-qualification and bid evaluation of contractors' submissions are: financial soundness, technical ability, management capability, health and safety, and reputation [3].

According to S.A. Tarawneh in the Jordanian construction industry sampled clients on the factors that could increase a contractor's chances of being pre-qualified and reported that the top ten factors are contractor's; willingness to offer a reasonable and competitive price to do the job after being qualified, strength and financial arrangements, previous track record and experience in similar projects, ability to provide a high-quality recommendation from satisfied clients, competence and knowledge to do the job, managerial capability and supervisory staff competence for the project, ability to select competent sub-contractors from a list provided by the client, ability to provide a detailed programme to execute the project, effectiveness and attitude to work with the client as a team, and size in relation to project size [6]. A specialised pre-qualification requirement is suggested: good manufacturing practices are required in the Jordanian construction industry. According to the report by M.A. Sidik et al., five critical factors influence the selection of contractors in Ghana: managerial capabilities, quality standards, resource availability, duration, project cost, and project location [18]. These factors should be prioritised when selecting the 'best' contractors for a construction project to ensure clients achieve social and economic value for money. The familiar considerations in the Ghanaian construction sector include the criteria for selecting contractors, based on evaluations of their management and technical abilities, experience, past performance, health and safety, and environmental measures [19].

However, a general bidder/contractor selection requirement that is expected of every construction project owner/client is that they should have at least: "Pre-qualification and bid evaluation procedures that involve different types of criteria to evaluate the overall suitability of contractors" [12]. Vital influencing factors for the selection of contractors, as perceived by clients and consultants, are: proper planning, creditworthiness, transition plans, plant and equipment holding, financial stability, past performance, and quality. It was further stated that there is a high likelihood of project success if a multi-criteria approach is used to select a contractor. In Turkey, O. Alptekin and N. Alptekin [2], found that the top twelve criteria that influence contractors' selection in public construction projects are; termination of construction work, the experience of technical staff, financial strength, financial credibility, lowest bid, safety plan and safety record, construction work quality reference, length of time in the construction sector, similar work experience, number of technical staff, materials and equipment, and work experience document.

Through a systematic review, M.C.B. Araujo et al. found that the most important selection criteria for contractors on construction projects are: price, health and safety, past project performance, duration, experience in similar jobs, and quality [20]. By considering these factors during contractor selection, critical aspects of the project, such as time, cost, and quality, are considered. The roles of management capability, technical ability, past performance records, financial capability, and health and safety performance have been highlighted as critical factors in contractors' selection [21][22]. Through a comprehensive review of the criteria for the contractors and the bid evaluation section, I. Rashid et al. [4] found that the most important criteria for selecting suitable contractors for construction projects are: management capability, financial capability, experience, resources, technical capability, environmental and safety, time of completion, and political considerations. In selecting an appropriate and suitable contractor for construction projects, it is good practice to consider and evaluate the contractor's safety records, how workers are compensated, the rate of injuries recorded, the periodic safety programme conducted, and the personnel safety competency level [9].

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Six selection criteria identified by M.K. Trivedi et al. include turnover, manpower resources, equipment resources, experience, past performance, and affordable, relatable projects [23]. The study of G. Manideepak et al. recommended that bid price (amount), financial soundness, technical ability, management capability, safety and health records, and reputation should form the basis for selecting suitable contractors on construction projects [24]. An extensive list of criteria outlined by K.P. Anagnostopoulos and A.P. Vavatsikos primarily encompassed technical performance, financial performance, safety and health policy, and public works past performance [25]. The common selection criteria for contractors in the literature are management capability, experience, resources, technical ability, financial capacity, and occupational health and safety [26][27]. Emphasis was, however, placed on management capability, as it has a major impact on contractors' performance in terms of time and cost. Some key selection criteria for Contractors, as determined from the reviewed literature, are summarized in Table 1.

Table 1. Contractors' selection criteria that impact construction project outcomes

S. No.	Contractor's selection criteria	Source(s)
1.	Competence and knowledge to do the job	[6], [2], and [19].
2.	Competitive tender/bid price	[6], [7], [2], [18], and [24].
3.	Environment measures	[4], and [2].
4.	Financial soundness	[3], [25], [24], [7], [26], [2], [4], [19], [18], and [28].
5.	Health and safety policy/performance	[3], [25], [24], [7], [26], [2], [4], [19], and [9].
6.	Managerial capability and competent supervisory staff	[3], [6], [24], [26], [2], [4], [19], and [18].
7.	Political consideration	[4]
8.	Previous track record and experience in similar projects	[6], [25], [23], [2], [4], [19], and [28]
9.	Project duration/time of completion	[6], [4], and [18].
10.	Project location	[2], and [18].
11.	Proper planning	[2], and [28]
12.	Quality compliance records	[6], [7], [2], [28, and [18].
13.	Resource availability	[23], [7], [4], and [18].
14.	Size in relation to project size	[6].
15.	Technical ability	[25], [3], [24], [26], [2], [4], [19], and [28].
16.	The reputation of the contractor	[3], [24], and [7].

2.2. Benefits of Contractors' Selection on Construction Projects

Several studies in the literature have established that the wrong choice of contractors during evaluation and selection leads to poor project performance, increasing financial costs, and other associated risks [29][30]. The essence of contractors' and sub-contractors' selection process is to achieve better project quality, maximise value, and maintain a strong and reliable symbiotic relationship among the contractual parties, while also mitigating potential project risks [7][31]. The selection of an appropriate contractor is essential to minimizing workplace accidents. This is especially true, as safety considerations are essential when selecting contractors compatible with the client's safety management systems [9]. P.S. Fong and S.K. Choi opine that clients eliminate elements that pose potential risks to project development during contractor selection [32].

Contractors' selection criteria help to speed up bid evaluation and contract awards. This is true because the number of tenderers is limited to those with the requisite financial capability, project experience, and other suitability criteria. Furthermore, unprepared contractors are easily identified and eliminated during the selection process. Bidders are protected from being assigned jobs beyond their capabilities and competencies, and project risks are reduced [33]. Thorough evaluations of the contractors' potential are conducted before employing them for the job. This enables optimal performance in terms of quality, cost, and time [34]. Selecting a competent contractor will help to guarantee success and the efficient use of scarce financial resources, as projects will be completed on time and within budget [35][36].

Serious consideration needs to be given to other contractor attributes, in addition to the lowest price. The project owner reported that the use of prequalification criteria helped reduce subjectivity in contractor selection [37]. Prequalification criteria contribute significantly to project success [38], thus helping clients to select the most qualified contractor that will not delay the project, cause failures, abuse, and misuse of project funds, and whose actions or inaction will not lead to project abandonment [1]. Contractors' selection is useful for evaluating experience, identifying capable and qualified contractors, and eliminating those without the required knowledge, competence, or financial stability [2]. The contractor's prequalification criteria are important in project planning because they significantly impact project outcomes [26]. The client scans for bidders who might default and eliminates them using selection criteria, thereby minimizing the likelihood of failed construction project contracts. This is achieved by streamlining the number of eligible bidders in the bidding process [39].

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According to the findings of D. Ayettey and H. Danso [19], the major benefits of the criteria used by clients for selecting contractors in construction projects include ensuring clients or project owners are able to choose contractors who are performers for the project, saving the project owner a lot of time minimising the possibility of contractor default, and facilitating the achievement of project success and the objectives within the scheduled time". The overall aim of the contractor selection criteria is to ensure that the contractor has the capability and know-how to deliver the project to the client's requirements. A suitable selection of a contractor is directly correlated with successful performance on construction projects [20]. Some essential benefits of the Contractors' selection criteria, as determined from the selected literature reviewed, are summarized in Table 2 below.

Table 2. Benefits of the Contractors' Selection Criteria in a Construction Project

S. No.	Benefits of the Contractor's selection criteria	Source(s)
1.	Minimizes project risks	[1], [7], [31], [2], [32], and [33].
2.	Supports better project quality	[34], [7], and [31].
3.	Promote a strong positive relationship between the contractual parties to the project.	[7], and [31].
4.	Minimizes accidents and improves workplace health and safety performance.	[9].
5.	Facilitate achieving project success and objectives within the scheduled time and cost.	[19], [33], [34], [35], and [36].
6.	Enhance project planning towards the outcome of the project	[26].
7.	Maximises overall value to the project owner or client	[2].
8.	Enables the client or project owner to select contractors who will perform on the project.	[19], [2], [1], [33], [38], [40], and [41].
9.	Minimizes the possibility of contractor default.	[39], and [19].
10.	Helps to speed up bid evaluation and contract awards, thus saving the client time	[33], and [2].
11.	Eliminates unprepared, incompetent, and unsuitable contractors.	[39], [42], [33], and [19].
12.	Selection of a contractor with sound financial management capabilities	[1], [2], [35], and [36].
13.	Reduced subjectivity in the selection of contractors by the project owner.	[37].

3 THEORETICAL FRAMEWORK

The research is based on the Theory of Multi-Criteria Decision Making (MCDM) and, specifically, on the Analytical Hierarchy Process (AHP), invented by Thomas L. Saaty in 1970. The AHP is a decision-making procedure that is structured and used to compare and analyze different alternatives using several criteria. This theoretical framework is particularly relevant to the selection of contractors because it helps compare their qualities, including financial stability, experience, and technical competence, by assessing their relative weight in project success.

The AHP enables decision-makers to transform complex and subjective evaluations into a consistent numerical scale by assigning weights to each criterion and ranking contractors based on them, thus making the decision-making process more systematic and logical [43]. The AHP is adopted in this study as a conceptual decision-making framework to explain how multiple contractor selection criteria may be systematically evaluated. These are the main criteria of the construction industry, where the success of the project delivery often relies on the choice of a relevant contractor. The applicability of this theory to the study is that it offers a systematic method for managing the various criteria that affect construction results. The AHP provides a theoretical basis for understanding multi-criteria evaluation in contractor selection and for identifying the most likely contractors to deliver positive project results, as project specialists in Rivers State strive to make informed decisions.

The theory's flexibility in complex decision-making situations, such as selecting construction projects, also underscores its significance. The AHP assumes that decision-makers can clearly differentiate among the various criteria and determine each criterion's relative importance to the project's success. The model presupposes that decision-makers can transform qualitative factors into quantitative data through pairwise comparisons. This ranking exercise is essential in ensuring that nothing is left out, including financial viability, technical skills, etc. The AHP also assumes that the decision-makers have sufficient information about the contractors and can objectively compare them against the set standards.

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These assumptions are highly consequential in light of the construction industry's dynamic character because they enable a more structured, transparent, and rational decision-making process. Furthermore, the applicability of the AHP to the selection of contractors in Rivers State is also supported by the fact that it provides a clear and justifiable reason as to why the best contractor is chosen, and this increases the likelihood of achieving favorable project results [43].

4 Materials and Methods

This study followed a survey research protocol that used a structured questionnaire to obtain responses from the main project specialists responsible for selecting and monitoring contractors for construction projects managed by the Rivers State Universal Basic Education Board (RSUBEB). The target population was professionals, such as members of tender evaluation committees, project consultants, project managers, procurement officers, and certified engineers, who are directly engaged in RSUBEB construction projects. The population size was 198 such professionals, yielding a representative subsample of industry specialists with relevant experience and expertise in contractor selection.

The study used a purposive sampling strategy to recruit the participants. The selection of this method was based on the respondents' expertise, experience, and availability. Purposive sampling is especially appropriate when the researcher is interested in people with specialized knowledge relevant to the research question. Although this method restricts the scope of generalizing the results to a larger group of individuals, it ensures that only the most qualified individuals are included in the study, and they can provide meaningful information on the process of contractor selection. Purposive sampling was therefore appropriate, as it targeted individuals directly involved in the contractor selection and monitoring process, thereby increasing the relevance and quality of the information gathered.

The Taro Yamane formula was used to calculate sample sizes of 132, a proven method for estimating sample sizes in survey research. The 91% response rate yielded many valid responses, which helps strengthen the findings. The sampling technique limits the extrapolation to larger groups of people. Still, the high response rate enhances the study's internal validity, as the data are from experts actively engaged in contractor selection in the given context.

The data-collection tool was a 5-point Likert-scale questionnaire (structured) that was broken down into three parts. The initial section was used to collect demographic data. In contrast, the second and third sections were used to obtain answers regarding the main criteria that affected the choice of contractors and the benefits that accompany the project outcomes. Although Likert-scale responses are ordinal, they are commonly treated as interval data in construction management research for descriptive and correlational analyses. This method was chosen because it is simple and easy to interpret, and the respondents can express their attitudes and perceptions clearly. The research recognizes that the use of Likert-scale data as an interval can limit the accuracy of statistical tests, and this was considered in the design and analysis phases.

The reliability of the instruments was determined through a test-retest method. The ten respondents selected as a convenience sample and not included in the main study population, but who had similar characteristics, were asked to complete the questionnaire twice, with a three-week gap between administrations. This was done to assess the instrument's temporal consistency. The ensuing reliability coefficient of 0.82, which exceeded the normal acceptable level of 0.70, indicated good reliability. Although the pilot sample size was limited, it was considered adequate for preliminary reliability assessment.

Statistical Package of the Social Sciences (SPSS) version 23 was used to analyze the data. The responses were summarized using descriptive statistics, including frequency tables, means, and simple percentages. The Pearson Product-Moment Correlation was used to investigate the relationship between variables. Despite Pearson correlation being an effective method for assessing the strength of association, the study acknowledges that correlation is not causation. In this regard, no causal conclusions are drawn about the criteria used to select contractors and the project's outcomes; the emphasis is on investigating the direction and strength of the associations. The use of Pearson correlation was also reasonable in this case, as it provides information on the strength of the relationship between the contractor selection criteria and the project success. However, the study suggests further studies that would include causal modelling to further explain the direction and nature of these relationships.

5 Results and Discussion

Table 3 revealed the selection criteria for major contractors in a construction project. The results, analysed using the weighted mean score (WMS), indicated that all suggested contractors' selection criteria were accepted, as their WMS exceeded the acceptance criterion of 3.0. Moreover, in terms of priority rating of these criteria, responses aggregated indicated that Financial soundness [FS] with ($\bar{X}$=4.79) was ranked 1st, while "Previous track record and experience in similar projects [PTRE]" with ($\bar{X}$=4.71) and "Competence and knowledge to do the job [CK]" with ($\bar{X}$=4.67) were ranked 2nd and 3rd respectively. On the other hand, the least responses were accorded to "Size in relation to project size [SRPS]" with ($\bar{X}$=3.79), "Environment measures [EM]" with ($\bar{X}$=3.71) and "Political consideration [PC]" with ($\bar{X}$=3.16) which ranked 12th, 13th, and 14th respectively.

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The result indicates that despite having all suggested criteria accepted as significant in contractors' selection process, issues of financial integrity, records and experience, and competence and wealth of technical knowledge of contractors play a central role in shaping stakeholders' perceptions of likely project outcomes. This finding is supported by studies by [19], [3], [25], and [4].

Table 3. Contractors' Selection Criteria in Construction Projects

Q. Item	Items	SA (5)	A (4)	N (3)	D (2)	SD (1)	SUM ∑	WMS $\bar{X}$	Decision	Rank
1.	Competence and knowledge to do the job [CK]	80 400	40 160	0 0	0 0	0 0	120 560	4.67	Agreed	3rd
2.	Competitive tender/bid price [CT]	50 250	40 160	5 15	25 50	0 0	120 475	3.96	Agreed	11th
3.	Environment measures [EM]	25 125	65 260	0 0	30 60	0 0	120 445	3.71	Agreed	13th
4.	Financial soundness [FS]	95 475	25 100	0 0	0 0	0 0	120 575	4.79	Agreed	1st
5.	Health and safety policy/performance [HSP]	65 325	45 180	10 30	0 0	0 0	120 535	4.46	Agreed	6th
6.	Managerial capability and competent supervisory staff [MCCS]	75 375	35 140	10 30	0 0	0 0	120 545	4.54	Agreed	4th
7.	Political consideration [PC]	20 100	40 160	0 0	60 120	0 0	120 380	3.16	Agreed	14th
8.	Previous track record and experience in similar projects [PTRE]	85 425	35 140	0 0	0 0	0 0	120 565	4.71	Agreed	2nd
9.	Project duration/time of completion [PDT]	35 175	70 280	0 0	15 30	0 0	120 485	4.04	Agreed	10th
10.	Project location [PL]	55 275	50 200	0 0	15 30	0 0	120 505	4.21	Agreed	9th
11.	Proper planning [PP]	55 275	50 200	15 45	0 0	0 0	120 520	4.33	Agreed	8th
12.	Quality compliance records [QCR]	75 375	35 140	10 30	0 0	0 0	120 545	4.54	Agreed	4th
13.	Resource availability [RA]	70 350	40 160	10 30	0 0	0 0	120 540	4.50	Agreed	5th
14.	Size in relation to project size [SRPS]	30 150	60 240	5 15	25 50	0 0	120 455	3.79	Agreed	12th
15.	Technical ability [TA]	55 275	55 220	10 30	0 0	0 0	120 525	4.38	Agreed	7th
16.	The reputation of the contractor [RC]	60 300	60 240	0 0	0 0	0 0	120 540	4.50	Agreed	5th

Results in Table 4 showed that respondents confirmed that contractors' selection criteria are positively associated with construction project outcomes, as aggregated responses to each item yielded a WMS greater than the criterion mean of 3.0. In terms of priority rating of reactions to each of the items, the highest responses were accorded "Eliminates unprepared, incompetent, and unsuitable contractors [EUIUC]" with ($\bar{X}$=4.67), "Selection of contractor with sound financial management capabilities [SCSFMC]" with ($\bar{X}$=4.63**),** and ("Minimizes accidents and promotes better health safety performance in the workplace [MAPBHS]", "Guarantees better project quality [BPQ]", and "Facilitates the achievement of project success and the objectives within the scheduled time and cost. [FAPSOSTaC]" with ($\bar{X}$=4.54**),** which were ranked 1st, 2nd, and 3rd respectively. On the other hand, the least of responses was accorded "Promotes strong positive relationship between contractual parties to the project [SPR]" and "Helps to speed up bid evaluation and contract awards, thus saving the client time [HSBECA]" having the same WMS, ($\bar{X}$=4.21), and ranked 7th. The results, therefore, indicated that contractors' selection criteria offer numerous benefits that enhance the overall outcome of construction projects, as corroborated by the study of M.M. Marzouk et al. [7], T. Monyane and F. Emuze [31], O. Alptekin and N. Alptekin [2], G. Nwachukwu [40], and O. Olatunji [41], among others.

Table 5 shows the Pearson correlation test result of the null hypothesis H_o1: there is no significant relationship between contractors' selection criteria and construction project outcomes. The output showed a Sig. (2-tailed) of (0.05>P=.000), which meant that since the probability value fell below .05, the null hypothesis is to be rejected, thus indicating that the relationship between contractors' selection criteria and construction project outcomes is statistically significant. Additionally, a correlation coefficient r = 0.846 indicated a strong positive relationship between the two variables.

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Table 4. Benefits of Contractors' Selection Criteria on Construction Project Outcome

Q. Item	Items	SA (5)	A (4)	N (3)	D (2)	SD (1)	SUM ∑	WMS $\bar{X}$	Decision	Rank
1.	Minimizes project risks [MPR]	65 325	50 200	5 15	0 0	0 0	120 540	4.50	Agreed	4th
2.	Guarantees better project quality [BPQ]	65 325	55 220	0 0	0 0	0 0	120 545	4.54	Agreed	3rd
3.	Promote a strong positive relationship between contractual parties to the project [SPR]	45 225	55 220	20 60	0 0	0 0	120 505	4.21	Agreed	7th
4.	Minimizes accidents and promotes better health safety performance in the workplace. [MAPBHS]	65 325	55 220	0 0	0 0	0 0	120 545	4.54	Agreed	3rd
5.	Facilitates the achievement of project success and the objectives within the scheduled time and cost. [FAPSOSTaC]	75 375	35 140	10 30	0 0	0 0	120 545	4.54	Agreed	3rd
6.	Enhances project planning towards the outcome of the project [EPP]	60 300	60 240	0 0	0 0	0 0	120 540	4.50	Agreed	4th
7.	Maximises overall value to the project owner or client [MOV]	55 275	65 260	0 0	0 0	0 0	120 535	4.46	Agreed	5th
8.	Enables the client or project owner to select contractors who are performers for the project [EBCS]	60 300	60 240	0 0	0 0	0 0	120 540	4.50	Agreed	4th
9.	Minimizes the possibility of contractor default [MPCD]	35 175	80 320	5 15	0 0	0 0	120 510	4.25	Agreed	6th
10.	Helps to speed up bid evaluation and contract awards, thus saving the client time [HSBECA]	50 250	55 220	5 15	10 20	0 0	120 505	4.21	Agreed	7th
11.	Eliminates unprepared incompetent and unsuitable contractors [EUIUC]	80 400	40 160	0 0	0 0	0 0	120 560	4.67	Agreed	1st
12.	Selection of contractor with sound financial management capabilities [SCSFMC]	75 375	45 180	0 0	0 0	0 0	120 555	4.63	Agreed	2nd
13.	Reduced subjectivity in the selection of contractors by the project owner [RS]	55 275	50 200	5 15	10 20	0 0	120 510	4.25	Agreed	6th

Table 5. Pearson Correlation Test of Ho1: There is no Significant Relationship between Contractors' Selection Criteria and Construction Project Outcomes

		Contractors' selection criteria	Benefits of contractors' selection criteria on construction projects
Contractors' selection criteria	Pearson Correlation	1	.846**
	Sig. (2-tailed)	-	.000
	N	120	120
Benefits of contractors' selection criteria on construction projects	Pearson Correlation	.846**	1
	Sig. (2-tailed)	.000	
	N	120	120

**. Correlation is significant at the 0.01 level (2-tailed).

The results of the study showed that financial soundness was the most significant criterion for selecting contractors, with a Weighted Mean Score (WMS) of 4.79. This was preceded by the previous track record and experience in similar projects (WMS=4.71) and competence and knowledge to do the job (WMS=4.67), which were ranked second and third, respectively. These findings highlight the importance of a contractor's financial stability, experience, and technical skills for successful construction project outcomes. Conversely, the lowest rankings were given to Political consideration (WMS=3.16) and Environment measures (WMS=3.71), which indicates that respondents assigned relatively lower priority to these factors compared to others.

Regarding the advantages of contractor selection criteria for project outcomes, the study found that contractor selection processes were positively associated with project success. The greatest benefits found were: "Eliminates unprepared, incompetent, and unsuitable contractors (WMS = 4.67) and Selection of contractor with good financial management capabilities (WMS = 4.63). Other advantages included reduced accidents and improved health and safety performance (WMS = 4.54), and assurance of high project quality (WMS = 4.54).

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Moreover, Pearson correlation analysis revealed that there was a strong positive relationship between the criteria of contractor selection and the outcomes of construction projects, with a correlation coefficient (r=0.846) and a significance value of p=0.000. This shows that the stringency of contractor selection criteria is strongly associated with improved project outcomes. The results of this research are consistent with several recent empirical studies that highlight the importance of financial soundness, experience, and competence in selecting contractors. A survey by A.R. Khoso and A.M. Yusof [5] emphasized that contractors with strong financial capacity are better positioned to manage project costs effectively. In the same vein, their study supported the importance of contractors' experience with similar projects.

These findings are reflected in the current study, where financial soundness was ranked first and previous track record second. A.R. Khoso and A.M. Yusof also noted that contractors' competence directly affects project success, confirming the study's finding that contractors' competence and technical knowledge are key to the successful completion of the project within the established timeframe. Moreover, the connection between financial soundness and project outcomes is supported by a study by Z.S. Chen et al. [30], which finds that contractors with high financial management potential reduce financial risk and deliver projects on time. All these studies support the importance of financial soundness, competence, and experience in the selection process, which is consistent with the conclusion of the current research that these factors significantly influence project outcomes.

Besides financial soundness and experience, health and safety performance has become a major criterion during contractor selection. Recent research also underscores the importance of this factor in ensuring positive project outcomes. A. Maqsoom et al. [28] confirmed that a contractor's capacity to effectively control health and safety minimizes accidents at the worksite, delays, and improves the quality of the project. This is in line with the present study's result that health and safety performance was rated among the best (WMS = 4.46). In the same way, a more recent study by I. Rashid et al. [4] found that contractors who are more concerned with safety measures and have effective safety management practices play a significant role in the successful completion of projects. This was reflected in their study of construction projects in Malaysia, where safety measures were strongly associated with reduced project disruptions and improved overall quality. These results indicate the growing significance of health and safety in contractor selection, confirming the conclusions of this research. Consequently, choosing contractors with strong safety records and practices may increase the likelihood of achieving improved project results, which aligns with the positive correlation between contractor selection and project success in this research.

In addition, recent research has placed significant emphasis on the contractor's past performance and track record in project completion. In Ghana, a study by M.A. Sidik et al. [18] and a study by O. Alptekin and N. Alptekin [2] both concluded that contractors who had been proven to have experience in similar projects were more likely to succeed in terms of cost management, time efficiency, and quality. M.A. Sidik et al. [18] observed that experience in similar projects helps manage resources and solve problems that directly affect project outcomes. This is in line with the ranking of the current study's second most important criterion: Previous track record and experience in similar projects (WMS = 4.71). In the same vein, a survey conducted by A. Maqsoom et al. [28] found that contractors with a good track record of performance on similar projects are chosen to reduce the risk of project failures and delays, thereby making the project execution process easier. These studies confirm that contractors with experience in the area are better able to meet quality, time, and cost expectations, which supports the results of this study. This underscores the continued applicability of past performance and experience as a major predictor of contractor success on construction projects and supports the study's findings regarding the importance of contractor selection based on past performance.

6 Conclusions and Recommendations

The study on the criteria for contractor selection and the outcomes of construction projects in Rivers State provides critical information on the factors that determine project success. The study adopts a multi-criteria decision-making perspective, informed conceptually by the Analytical Hierarchy Process (AHP). The AHP helps in making comparative assessments of contractors on these dimensions, providing a conceptual foundation for understanding multi-criteria contractor selection for construction projects in Rivers State. Such a theoretical framework enables the identification of the main variables associated with successful outcomes and contributes to the study's overall purpose. The empirical findings show that financial soundness is the most salient criterion, followed by previous track record and competence. These results highlight the importance of the ability of a contractor to control fiscal resources, use experience, and show technical skills in delivering a project successfully. The results are consistent with the available literature, which has consistently emphasized the primacy of these variables in predicting project success. The research confirms that health and safety are decisive factors, and safety-oriented contractors perform better in quality, cost management, and schedule compliance. The adoption of AHP as a decision-making framework provides a structured approach to contractor selection. This is demonstrated by a strong positive relationship (r = 0.846) between the selection criteria and project outcomes, indicating that a careful selection process is strongly associated with project success. The systematic nature of AHP provides a conceptual basis for assigning relative importance to contractor selection criteria, which produces more informed and rational decisions, which is an asset in the complex and competitive construction industry.

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The research supports the assumption that careful, methodical contractor selection is essential to the successful project results. The use of AHP enhances the significance of financial strength, past performance, effectiveness, and safety factors. These factors, when properly assessed, increase the likelihood of project completion on time, on budget, and to the desired quality. The results recommend the extensive use of a multi-criteria method, including AHP, in the contractor selection process to reduce risks and improve the management of construction projects in Rivers State and other states. Based on the above, the study made the following recommendations:

1) Focus on Financial Healthiness of Contractor Selection: Building on the empirical data that financial health turns out to be the most important factor in contractor selection, it is recommended that the project owners should put a primary emphasis on the systematic analysis of the fiscal capacity of a contractor. Such an evaluation must include an in-depth analysis of the contractor's creditworthiness, financial records, and demonstrated ability to handle project budgets accurately. The risk of project delays or disastrous failure due to economic instability is significantly reduced by ensuring that contractors have a strong financial base, thereby creating a path to easier project implementation and the achievement of positive results.

2) Integrate Health and Safety Performance as a Key Criterion: The above study highlights the importance of health and safety performance of a contractor as a key factor in the overall success of a construction project. It is therefore the responsibility of the project owners to incorporate health and safety records as a mandatory criterion for selection. Contractors that have proven they maintain high safety standards and take proactive measures to ensure safety should be given special treatment. The outcome will be twofold: a real decrease in on-site accidents and delays, and improved worker welfare, thereby increasing the overall efficiency and quality of the construction project.

3) Put Past Performance and Relevant Experience First: Since the study has an express focus on the past performance of contractors and their experience on similar projects, it is only wise that the project owners conduct a stringent evaluation of the past performance of a contractor in similar projects. This evaluation must involve a careful examination of the work completed, the degree of client satisfaction, and the contractor's ability to solve complex problem situations. Favouring contractors with a record of success on similar projects will, in turn, support better management, scheduling, and adherence to project quality standards, resulting in significantly better project outcomes.

6.1. Study Limitations

The use of purposive sampling is a critical limitation of this study, as it restricts the external validity of the conclusions. The sample might not be a sufficient reflection of the views and practices of contractors or project managers working outside this jurisdiction or in other sectors of Nigeria, as the respondent pool was limited to professionals directly involved in the contractor selection process at the Rivers State Universal Basic Education Board (RSUBEB). In addition, the use of self-reported information introduces potential bias and subjectivity, as the respondents, in this case, the project specialists, bring their personal perceptions and experiences to the instrument and may thereby bias the results. Lastly, the study is limited by its geographic scope, which is confined to one state, thereby limiting the generalizability of the findings to other states or countries where construction industry dynamics differ significantly.

6.2. Future Research Directions

Future studies would be improved by expanding the sample to include a greater number of stakeholders, such as contractors, clients, and consultants, in different regions of Nigeria, thus increasing the overall generalizability of the results. Also, researchers may consider applying multi-criteria decision-making (MCDM) paradigms, such as the Analytical Hierarchy Process (AHP), to a wider range of construction projects, including both government and commercial projects. Longitudinal studies may shed light on how contractor selection criteria have changed over time and how these criteria have lasting effects on project performance. Lastly, it would be beneficial to incorporate qualitative methods, such as semi-structured interviews or in-depth case studies, to provide a deeper understanding of the factors that underline contractor selection and project success and to supplement the quantitative data provided herein.

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ETHICS STATEMENT

The study involved voluntary participation of respondents through a questionnaire survey. Anonymity and confidentiality were ensured, and no ethical approval was required due to the non-invasive nature of the study.

STATEMENT OF CONFLICT OF INTERESTS

The authors declare no conflicts of interest related to this study.

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