

The effect of public procurement processes on the performance of public projects



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ABSTRACT

This study investigates the impact of public procurement procedures on the efficacy of public projects within Zambia's Ministry of Infrastructure, Housing and Urban Development (MIHUD) and the Ministry of Local Government and Rural Development (MLGRD). Inefficient procurement methods, characterised by delays, cost overruns, and inferior project quality, have impeded the successful execution of public projects, especially in infrastructure and rural development. The research is to evaluate the impact of Supplier Qualification Screening (SQS), Competitive Bidding (CB), and Supplier Evaluation (SE) on project performance. A quantitative research methodology was utilised, employing a survey-based descriptive design to gather data from 120 procurement experts and project managers within the designated ministries. Structural Equation Modelling (SEM) was employed to examine the correlations between procurement methods and project outcomes. The results demonstrate that SQS and CB enhance project performance by facilitating timely delivery and cost effectiveness. Nonetheless, SE exerted a detrimental impact, indicating that too rigorous evaluation processes may result in delays and impede project accomplishment. Hypothesis testing validated these findings, corroborating the alternative hypotheses for SQS and CB, however SE demonstrated an inverse correlation with project outcomes. The report advocates for the fortification of regulatory frameworks, the augmentation of capacity-building programs, the rectification of bureaucratic inefficiencies, and the encouragement of e-procurement platform usage to enhance procurement efficiency. A review of supplier evaluation procedures is essential to avert needless delays in project execution. The study's results have substantial implications for procurement reforms and efficiency enhancements in Zambia. Improving openness, accountability, and stakeholder collaboration in procurement procedures can result in superior project outcomes, fostering national infrastructure development and socio-economic advancement, especially in rural regions. Enhancing procurement policies and using digital solutions will be crucial in developing a more efficient and accountable public procurement system.

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Introduction

Public procurement is essential for the effective implementation of government projects, particularly in infrastructure, housing, and urban development sectors. Efficient procurement methods guarantee the effective utilisation of public resources, hence promoting the overall socio-economic growth of a nation. Nonetheless, inefficiencies in public procurement can have substantial adverse effects, especially in poor nations such as Zambia. These inefficiencies frequently result in cost overruns, project delays, and subpar outcomes, all of which exert adverse socio-economic impacts. Cost overruns in projects can burden public finances, reallocating resources from critical services like healthcare and education (Arrowsmith, 2010). Prolonged delays in the execution of infrastructure projects can hinder economic activities, impact local communities, and diminish the expected social advantages of these initiatives (CIPS, 2019). Moreover, substandard quality in public projects, stemming from deficient procurement methods, can cause premature infrastructure deterioration, diminishing its long-term worth and escalating maintenance expenses (Menkhoff & Neubert, 2011). Inefficiencies in public procurement processes can substantially impede economic growth, aggravate poverty, and restrict governments' capacity to achieve development objectives (Slemrod & Wilson, 2014).

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The socio-economic consequences of procurement inefficiencies transcend immediate project failures, influencing overarching national development goals. The Ministries of Infrastructure, Housing and Urban Development (MIHUD) and Local Government and Rural Development (MLGRD) in Zambia supervise essential infrastructure projects aimed at fostering economic growth and enhancing citizens' living conditions. Nonetheless, procurement inefficiencies, including insufficient openness, inadequate supplier assessments, and reliance on antiquated procurement techniques, compromise the efficacy of these programs (Bovis, 2016). Delays and budget overruns in public projects diminish the government's capacity to provide important services promptly, thereby impacting people's quality of life. In Zambia, these concerns are more severe, exacerbating an already significant burden of poverty and infrastructure deficiencies. Inefficient procurement processes deter potential investors, impede the competitiveness of local firms, and diminish the country's capacity to achieve its sustainable development goals (Thai, 2001). Consequently, optimising procurement processes is essential for improving the socio-economic results of public projects and promoting sustained economic stability and progress in Zambia.

This study aims at examining the influence of public procurement processes on the effectiveness of public projects in Zambia's Ministry of Infrastructure, Housing and Urban Development (MIHUD) and the Ministry of Local Government and Rural Development (MLGRD). Inefficient procurement practices, marked by delays, budget overruns, and substandard project quality, have hindered the successful implementation of public projects, particularly in infrastructure and rural development. The study also aims to assess the influence of Supplier Qualification Screening (SQS), Competitive Bidding (CB), and Supplier Evaluation (SE) on project performance.

Literature Review

Globally, the efficiency of public procurement processes has been a critical factor in determining the success of government projects. Studies indicate that inefficiencies such as delays, cost overruns, and quality issues are widespread, impacting economies in both developed and developing countries. A study by Henningsson et al. (2022) explored how digitalization of procurement processes can address inefficiencies in Sweden's public procurement system. The study utilized a mixed-method approach combining qualitative interviews with procurement officers and a quantitative analysis of procurement data, focusing on the effects of e-procurement tools on efficiency. The findings revealed that digital tools, such as electronic tendering and contract management software, significantly reduced delays and improved transparency, thus lowering procurement costs and minimizing corruption. Similarly, in the United Kingdom, the use of e-procurement was shown to enhance the procurement efficiency in public sector construction projects. According to Wright et al. (2023), the adoption of blockchain technology in public procurement has increased transparency and reduced the time and costs associated with procurement, offering an innovative solution to traditional inefficiencies. Their study, which employed a case study approach to examine the application of blockchain in public procurement, showed that these technological advancements led to substantial improvements in public project delivery.

In the United States, research by Kearney et al. (2022) found that policy reforms focusing on procurement efficiency and transparency were essential in improving public sector outcomes. Their research used a longitudinal study design, analyzing procurement data from federal and state-level projects over a 10-year period. The findings underscored that procurement reforms aimed at simplifying procedures and introducing competitive bidding processes were linked to better project outcomes, such as cost savings and enhanced delivery times. These reforms were also found to be positively associated with increased public trust and a reduction in corruption risks. Overall, these studies highlight the importance of digitalization and policy reforms in enhancing procurement efficiency, particularly in the public sector, and demonstrate that technological innovations and transparent policies are effective strategies for improving procurement outcomes across different countries.

In Africa, procurement inefficiencies remain a significant challenge, affecting economic development and public service delivery. A study by Olowu et al. (2022) focused on Nigeria's public procurement system, examining how inefficiencies such as cost overruns and delays affect national development. The study employed a mixed-methods approach, using surveys of procurement officers and project managers combined with document analysis of procurement records from various government ministries. Findings indicated that procurement inefficiencies in Nigeria were often attributed to a lack of proper training for procurement officers, ineffective regulatory oversight, and political interference. Furthermore, delays in project delivery were frequently linked to poor coordination and transparency in the procurement process. This study aligns with findings from other African countries, such as South Africa, where Ndhlovu et al. (2023) examined the role of digitalization in improving procurement efficiency. Using a case study approach, the researchers analyzed how the introduction of e-procurement platforms in South Africa's public sector led to faster project completion times and reduced opportunities for corruption. The study highlighted the importance of digital solutions in enhancing transparency and accountability, which in turn improved the performance of public procurement.

Similarly, a study by Njeru et al. (2024) on Kenya's procurement reforms revealed that while policy reforms have been introduced to address inefficiencies, challenges such as resistance to change and inadequate technological infrastructure persist. The study used a quantitative survey design to assess the impact of procurement reforms in the construction and infrastructure sectors. It was found that digital platforms, such as e-tendering and electronic procurement systems, improved transparency but were underutilized due to limited access to technology in rural areas. The study concluded that although procurement reforms had led to some improvements in efficiency, full implementation was hindered by socio-economic factors and institutional barriers. These findings underscore the

need for context-specific solutions in Africa, considering both technological and socio-political constraints when implementing procurement reforms to improve efficiency.

In Zambia, procurement inefficiencies have been identified as key barriers to the successful implementation of public projects. A study by Chanda et al. (2023) assessed the impact of procurement inefficiencies on infrastructure development within the Ministry of Infrastructure, Housing, and Urban Development (MIHUD). Using a cross-sectional survey design, the research found that delays in project delivery and cost overruns were common due to a lack of a streamlined procurement process and inadequate procurement planning. The study emphasized that inefficient supplier evaluations and the absence of e-procurement systems were major contributors to these challenges. Chanda et al. (2023) also highlighted that corruption and a lack of accountability further exacerbated procurement inefficiencies. These findings were consistent with a previous study by Mwamba (2022), which focused on the local government sector in Zambia. Mwamba's research, employing a qualitative case study methodology, revealed that public procurement systems often lacked transparency, leading to the selection of suboptimal suppliers and the subsequent failure of infrastructure projects.

Digitalization has been seen as a potential solution to procurement inefficiencies in Zambia. A study by Sampa et al. (2024) explored the adoption of e-procurement in Zambia's public sector, specifically focusing on how digital platforms could improve procurement efficiency in urban development projects. Using both qualitative interviews and quantitative data analysis, the study concluded that the adoption of e-procurement could enhance transparency, reduce procurement timelines, and improve supplier selection. However, the study also noted significant barriers to full adoption, including limited internet access, inadequate training, and resistance to technological change among procurement officials. Similarly, a study by Zulu and Mumba (2022) focused on policy reforms within Zambia's public procurement system. Their research, which utilized a mixed-methods approach, found that while recent reforms aimed at enhancing procurement efficiency had led to some improvements, challenges such as poor enforcement of regulations and inconsistent application of procurement procedures persisted. The study recommended further reforms, including the digitalization of the procurement process and the strengthening of regulatory frameworks to enhance accountability and transparency in public procurement. These findings underscore the need for comprehensive reforms in Zambia to address both technological and institutional challenges in public procurement.

Agency Theory, developed by Jensen and Meckling (1976), is based on the relationship between principals (those who delegate authority) and agents (those who act on behalf of the principals). This theory is highly relevant to public procurement processes, where government bodies (principals) rely on external contractors or suppliers (agents) to carry out public projects. One of the core concerns in procurement is the potential for conflicts of interest, as agents may act in ways that benefit themselves at the expense of the principals' objectives, such as increasing costs or delaying project timelines (Eisenhardt, 1989). In the context of this study, Agency Theory helps explain procurement inefficiencies, such as cost overruns and delays, by emphasizing the misalignment between the objectives of the procuring authorities and the contractors. This theory suggests that proper monitoring, incentivization, and alignment of interests between principals and agents can reduce these inefficiencies. Agency theory has been applied to public procurement systems in various countries, including Zambia, where poor oversight, lack of accountability, and corruption contribute to procurement inefficiencies (Chanda et al., 2023). By employing Agency Theory, this study examines how the procurement process in Zambia can be improved by enhancing the relationship between the government (principals) and the suppliers (agents), fostering better transparency, accountability, and performance.

Performance Management Theory (PMT) emphasizes the importance of measuring and managing performance to achieve organizational goals. This theory has been particularly useful in understanding the effectiveness of processes in both the public and private sectors (Kaplan & Norton, 1992). The theory asserts that setting clear performance standards, monitoring progress, and evaluating outcomes are essential for ensuring the successful delivery of projects. In the context of public procurement, PMT can be applied to evaluate how procurement processes, such as supplier qualification, competitive bidding, and evaluation procedures, impact the overall performance of public projects. Studies show that the lack of effective performance management in procurement processes can lead to suboptimal outcomes, such as cost overruns, delays, and poor quality (Poghosyan, 2022). In Zambia, where procurement inefficiencies often result from weak performance monitoring and evaluation systems, PMT can guide the development of a more structured approach to procurement oversight. The theory is crucial for this study because it helps assess the role of procurement performance measures in reducing inefficiencies and improving public project delivery. By applying PMT, this study evaluates how performance metrics can be used to streamline procurement processes and ensure that public projects meet their intended goals (Kearney et al., 2022).

The conceptual framework (Figure) of this study draws upon insights from the literature review and theories discussed earlier to elucidate the relationships between key variables. The framework operationalizes variables into independent, intervening, and dependent categories, providing a structured approach to understanding the research phenomenon. Supplier qualification screening, informed by agency theory and performance management theory, aims to ensure supplier credibility, financial stability, and adherence to specifications. This process aligns with the principles of agency theory, which emphasizes the need to mitigate moral hazard and adverse selection risks by aligning agent incentives with principal interests. Additionally, performance management theory underscores the importance of effective decision-making and financial oversight in project execution.

Competitive bidding, influenced by agency theory and performance management theory, promotes transparency, authenticity, and value for money. By allowing suppliers to voluntarily submit tenders, competitive bidding fosters competition and ensures fair pricing, thereby aligning with the principles of agency theory's risk-sharing problem and performance management theory's emphasis on financial management. Supplier evaluation, guided by agency theory and performance management theory, focuses on selecting suppliers with the lowest price and highest quality standards. This process reflects agency theory's emphasis on aligning agent incentives with principal interests, as well as performance management theory's emphasis on measuring key project metrics to enhance overall performance. Organizational performance, informed by agency theory and performance management theory, is measured by evaluating the effectiveness and efficiency of project outcomes. Drawing on agency theory's focus on mitigating conflicts of interest and performance management theory's emphasis on optimizing decision-making processes, organizational performance serves as the ultimate dependent variable in the conceptual framework.

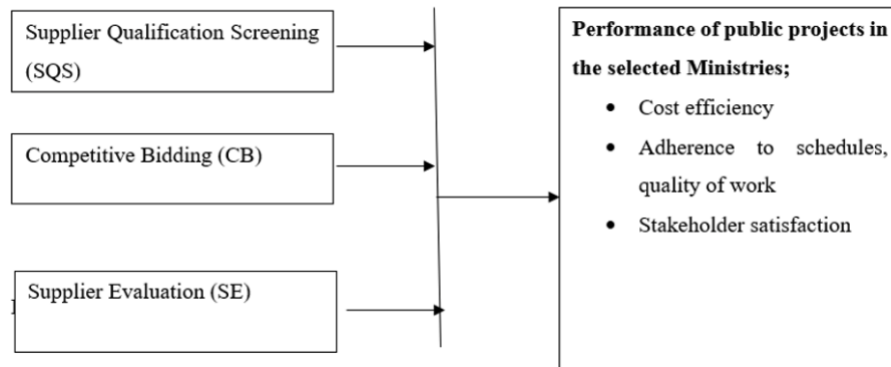


Figure 1: Conceptual framework of procurement process on performance derived from Lysons and Farrington (2016)

The conceptual framework of the study outlines the relationships among the key variables, with the general objective focusing on assessing the impact of public procurement processes on the performance of public projects in the Ministry of Infrastructure and Ministry of Local Government and Rural Development.

Supplier Qualification Screening refers to the process of assessing and verifying the capabilities of potential suppliers before awarding contracts. It involves evaluating suppliers based on criteria such as financial stability, experience, technical capacity, and compliance with regulations. In the context of this study, the screening process is crucial for ensuring that only competent and reliable suppliers are selected to participate in public projects. Effective supplier qualification is expected to improve the performance of public projects by reducing delays, minimizing risks of poor quality, and ensuring adherence to project specifications.

Competitive bidding is a procurement process in which multiple suppliers are invited to submit bids for a project, with the contract awarded to the supplier that offers the best value based on cost, quality, and other factors. This process fosters transparency, fairness, and competition, which helps in securing services and goods at the most competitive prices while ensuring that projects are delivered efficiently. For public projects, competitive bidding is vital in optimizing resource allocation, enhancing efficiency, and achieving value for money, thereby influencing the overall performance of public projects in terms of cost, timeliness, and quality.

Supplier Evaluation refers to the continuous assessment of supplier performance throughout the execution of a project. It involves monitoring and rating suppliers based on their ability to meet contractual obligations, maintain quality standards, and manage resources effectively. In public procurement, supplier evaluation ensures that suppliers remain accountable and responsive to project demands. By evaluating suppliers consistently, the likelihood of project delays, cost overruns, and quality issues can be reduced, positively affecting the performance of public projects.

The performance of public projects is the outcome or dependent variable in this study, which is influenced by the independent variables of supplier qualification screening, competitive bidding, and supplier evaluation. Project performance is typically measured by factors such as cost efficiency, adherence to schedules, quality of work, and stakeholder satisfaction. In this study, the performance of public projects in the Ministry of Infrastructure and the Ministry of Local Government and Rural Development is assessed to determine how procurement processes impact successful project delivery.

These variables form the basis for addressing the specific objectives and research questions, allowing for a comprehensive examination of how supplier qualification screening, competitive bidding, and supplier evaluation collectively influence the overall performance of public projects in the selected Ministries. The Likert scale measurements provide a quantitative basis for assessing the respondents' perceptions and opinions, contributing to a nuanced understanding of the relationships within the conceptual framework.

Based on the conceptual model in Figure, this study has the following hypotheses;

H0: Supplier qualification screening (SQS) has no significant influence on performance of public projects in the selected Ministries.

H1: Supplier qualification screening (SQS) has a significant influence on performance of public projects in the selected Ministries.

H0: Competitive bidding (CB) has no significant influence on performance of public projects in the selected Ministries.

H1: Competitive bidding (CB) has a significant influence on performance of public projects in the selected Ministries.

H0: Supplier evaluation (SE) has no significant influence on performance of public projects in the selected Ministries.

H1: Supplier evaluation (SE) has a significant influence on performance of public projects in the selected Ministries.

The hypotheses were tested using multiple linear regression analysis, employing Stata version 15 software. The independent variables, including Supplier Qualification Screening, Competitive Bidding, and Supplier Evaluation, were incorporated into the regression model alongside key performance indicators, with Public Project Performance serving as the dependent variable. The Likert scale responses collected quantitatively were assigned numerical values and integrated into the regression analysis, allowing for the examination of the impact of procurement processes on project performance.

Table 1: Operationalization and Measurement of Variables

Variable	Dimension	Indicator	Operationalization	Measurement
Supplier Qualification Screening (SQS)	Financial Stability	Credit rating, revenue stability	Assessing suppliers' financial health through financial statements, credit ratings, and revenue consistency over the past few years.	Likert scale (1-5) rating
	Experience	Years in operation, previous project portfolio	Evaluating the number of years suppliers have been in business and the relevance of their past project experiences to the current project requirements.	Likert scale (1-5) rating
	Technical Capacity	Staff qualifications, equipment availability	Reviewing qualifications of key personnel and assessing the availability of necessary equipment and technology to execute the project effectively.	Likert scale (1-5) rating
	Compliance with Regulations	Certifications, compliance records	Verifying suppliers' adherence to relevant laws, regulations, and standards, including required certifications for public projects.	Likert scale (1-5) rating
Competitive Bidding (CB)	Transparency	Availability of bidding documents	Ensuring that bidding documents are publicly available and that the bidding process follows established guidelines for transparency.	Likert scale (1-5) rating
	Fairness	Equal opportunity for all bidders	Evaluating the fairness of the bidding process, including the absence of favoritism or discrimination in awarding contracts.	Likert scale (1-5) rating
	Value for Money	Cost comparison, quality assessments	Analyzing the bids to assess the best value based on cost and quality, ensuring that projects are delivered at competitive prices while maintaining quality.	Likert scale (1-5) rating
Supplier Evaluation (SE)	Performance Monitoring	Timeliness of deliveries, quality of work	Regularly assessing suppliers during project execution based on their adherence to timelines and quality standards as outlined in the contract.	Likert scale (1-5) rating
	Accountability	Resolution of issues, responsiveness	Evaluating how suppliers respond to issues and their accountability in addressing any performance gaps or challenges during the project execution.	Likert scale (1-5) rating
Performance of Public Projects (PP)	Cost Efficiency	Budget adherence, cost overruns	Assessing the extent to which projects are completed within the allocated budget and monitoring any cost overruns that occur during execution.	Likert scale (1-5) rating
	Adherence to Schedules	Timeliness of project completion	Evaluating whether projects are completed on time based on established timelines and schedules.	Likert scale (1-5) rating
	Quality of Work	Compliance with project specifications	Measuring the quality of work delivered against project specifications and standards as outlined in the contract documents.	Likert scale (1-5) rating
	Stakeholder Satisfaction	Feedback from stakeholders, end-users	Collecting feedback from stakeholders and end-users regarding their satisfaction with project outcomes, quality, and overall delivery.	Likert scale (1-5) rating

Research and Methodology

This study employed a quantitative research approach to investigate the effects of public procurement processes on the performance of public projects within the Ministry of Infrastructure, Housing, and Urban Development (MIHUD) and the Ministry of Local Government and Rural Development (MLGRD) in Zambia. A quantitative approach was selected due to its suitability in analyzing numerical data through structured surveys and statistical models, allowing for objective measurement of relationships between procurement processes and project performance (Creswell, 2014). This approach provided statistical rigor in evaluating procurement efficiency and its direct impact on public project performance. A cross-sectional research design was adopted, as it enables data collection at a single point in time, offering a snapshot of procurement practices' impact over a defined period (Saunders, Lewis, & Thornhill, 2019). The study examined procurement processes between 2010 and 2024, assessing their cumulative effect on project success. This design was particularly beneficial for identifying patterns and trends in procurement efficiency without requiring longitudinal data collection. The target population comprised procurement officers, project managers, and key stakeholders involved in procurement and project execution within MIHUD and MLGRD. These ministries were selected due to their central role in overseeing infrastructure and local government projects, which are heavily reliant on public procurement processes.

A stratified random sampling technique was used to ensure a representative sample from different departments within the ministries. The sample was divided into three strata based on expertise: procurement officers, project managers, and financial officers. This method ensured the inclusion of diverse perspectives on procurement effectiveness. The final sample size was determined using Cochran's formula, yielding a sample of 120 respondents. Out of the 120 distributed questionnaires, 100 were completed and returned, resulting in a response rate of 83%. This high response rate is considered statistically significant, exceeding the minimum threshold of 50% recommended for robust data analysis (Mugenda & Mugenda, 2012). The strong response rate minimized non-response bias, enhancing the reliability of the findings. Primary data were collected through structured questionnaires distributed to procurement officers and project managers. These questionnaires assessed procurement process efficiency, project delays, cost overruns, and supplier evaluation criteria. The instrument included Likert-scale questions, allowing for numerical quantification of perceptions regarding procurement effectiveness. Secondary data were gathered from government procurement reports, audit documents, and existing literature on public procurement policies. These secondary sources supplemented primary data, providing historical context on procurement inefficiencies and reforms in Zambia.

To enhance the validity of the study, the questionnaire underwent content and construct validity testing through expert reviews. Procurement specialists and academics assessed the relevance and clarity of survey items, ensuring alignment with the research objectives. Additionally, a pilot study involving 10 respondents was conducted to refine the questionnaire, confirming its clarity and appropriateness before full deployment. Reliability was measured using Cronbach's Alpha, a widely used internal consistency measure. A Cronbach's Alpha coefficient of 0.985 was obtained, indicating a high level of reliability, as values above 0.7 are considered strong (Neuman, 2013). Item-total statistics further validated the consistency of individual survey items, with correlations ranging from 0.943 to 0.978, affirming their contribution to overall reliability.

The collected quantitative data were analyzed using descriptive and inferential statistical methods, facilitated by Stata version 15.

Descriptive statistics (mean, standard deviation, and frequency distributions) were used to summarize respondent demographics and procurement efficiency levels. Inferential statistics included multiple linear regression analysis, which examined relationships between the independent variables (Supplier Qualification Screening, Competitive Bidding, and Supplier Evaluation) and the dependent variable (Public Project Performance).

The multiple regression model was specified as follows:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \epsilon$$

Where:

- i. Y = Public Project Performance
- ii. X_1 = Supplier Qualification Screening
- iii. X_2 = Competitive Bidding
- iv. X_3 = Supplier Evaluation
- v. α = Constant
- vi. ϵ = Error term
- vii. $\beta_1, \beta_2, \beta_3$ = Coefficients of predictors

Additionally, correlation analysis was performed to assess the strength and direction of relationships among variables. The Likert scale responses (ranging from 1 = Strongly Agree to 5 = Strongly Disagree) were quantified and used as explanatory variables in the regression model. The coefficients derived from the model provided insights into how procurement processes impact public project performance. The study adhered to ethical research principles, including informed consent, confidentiality, and voluntary participation. Ethical clearance was obtained from relevant institutional bodies, and respondents were assured that their data would

be used strictly for academic purposes. This rigorous methodology ensured data accuracy, reliability, and validity, enabling a robust analysis of procurement processes' effects on public project performance in Zambia.

Table 2: Summary of Literature Review

Author (Date)	Subject	Variables	Methods	Findings
Henningsson et al. (2022)	Digitalization in Sweden's public procurement system	E-procurement tools, efficiency, transparency	Mixed-method approach (qualitative interviews + quantitative analysis of procurement data)	E-procurement tools reduced delays, improved transparency, and lowered procurement costs
Wright et al. (2023)	Blockchain technology in UK public procurement	Transparency, cost reduction, procurement efficiency	Case study approach	Blockchain improved transparency, reduced procurement time, and lowered costs
Kearney et al. (2022)	Procurement reforms in the US public sector	Policy reforms, procurement efficiency, public trust	Longitudinal study (federal & state-level procurement data over 10 years)	Competitive bidding and simplified procedures improved project outcomes, reduced corruption risks
Olowu et al. (2022)	Procurement inefficiencies in Nigeria	Cost overruns, delays, lack of training	Mixed-methods (survey of procurement officers + document analysis)	Poor training, regulatory inefficiencies, and political interference led to delays and cost overruns
Ndhlovu et al. (2023)	Digitalization in South Africa's public procurement	E-procurement, transparency, project delivery	Case study approach	E-procurement platforms improved efficiency and reduced corruption
Njeru et al. (2024)	Procurement reforms in Kenya	Digital platforms, transparency, adoption barriers	Quantitative survey design	E-tendering improved transparency, but technological infrastructure challenges persist
Chanda et al. (2023)	Procurement inefficiencies in Zambia's MIHUD	Supplier evaluation, procurement planning, project delivery	Cross-sectional survey design	Lack of streamlined procurement planning and supplier evaluation caused delays and cost overruns
Mwamba (2022)	Transparency in Zambia's local government procurement	Supplier selection, project failure	Qualitative case study	Poor transparency led to selection of suboptimal suppliers, impacting project success
Sampa et al. (2024)	Adoption of e-procurement in Zambia	Digital platforms, efficiency, supplier selection	Mixed-methods (interviews + quantitative data analysis)	E-procurement enhanced transparency but faced barriers like poor internet access and lack of training
Zulu & Mumba (2022)	Policy reforms in Zambia's public procurement system	Regulatory frameworks, enforcement challenges	Mixed-methods approach	Some procurement efficiency improvements, but weak regulation enforcement remained a barrier

Results and Discussions

The findings of this study are presented in thematic sections to improve readability and clarity. The key themes include efficiency gains in public procurement, challenges in supplier evaluation, and procurement best practices. These themes align with the study's objectives and Structural Equation Modelling (SEM) results, offering a comprehensive understanding of the impact of procurement processes on public project performance. The study established that supplier qualification screening and competitive bidding significantly enhance the performance of public projects. Supplier qualification screening demonstrated a strong positive impact on project outcomes, as indicated by the SEM results (0.93, $p < 0.05$). Ministries that effectively screened suppliers before awarding contracts experienced improvements in project execution, reduced procurement risks, and enhanced contract compliance. The findings suggest that pre-qualifying suppliers based on competence, financial capacity, and past performance leads to better project efficiency and accountability. Competitive bidding was found to be the most influential factor in improving project performance, with a significant positive coefficient (1.59, $p < 0.05$). Ministries that adhered to transparent and competitive procurement procedures observed better cost efficiency, reduced corruption risks, and improved service delivery. Competitive bidding processes enabled the selection of qualified contractors at optimal costs, contributing to timely project completion and effective resource utilization. The

results affirm that supplier qualification screening and competitive bidding are essential for achieving efficiency in public procurement, ensuring that public projects are executed effectively and within budgetary constraints.

An unexpected finding was the negative impact of supplier evaluation on project performance, as indicated by the SEM results ($-1.58, p < 0.05$). Contrary to expectations, stringent evaluation criteria and complex administrative procedures were found to hinder rather than enhance project efficiency. One major challenge identified was the excessive rigidity in supplier evaluation procedures, which often led to procurement delays. Ministries that implemented highly bureaucratic evaluation systems experienced prolonged approval processes, resulting in stalled projects and increased costs. Additionally, strict documentation requirements excluded some potentially capable suppliers, reducing competition and limiting access to quality service providers. The study further revealed that the complexity of supplier evaluation frameworks created bottlenecks in procurement workflows, affecting project timelines and overall performance. While the objective of supplier evaluation is to ensure quality and compliance, the findings suggest that an overly rigid approach can lead to inefficiencies. These challenges highlight the need for a more balanced and flexible supplier evaluation system that maintains accountability while minimizing unnecessary procedural delays.

Based on the study's findings, several best practices were identified to improve procurement effectiveness and project performance. Optimizing supplier qualification screening can enhance procurement efficiency. Ministries should refine qualification criteria to ensure that only competent suppliers participate in bidding while avoiding exclusionary practices that limit competition. Digitalizing supplier registration and pre-qualification processes can further streamline procurement operations. Strengthening competitive bidding mechanisms is essential for ensuring cost-effectiveness and transparency in public procurement. Implementing e-procurement systems can improve accessibility and prevent bid manipulation. Additionally, strict monitoring mechanisms should be enforced to uphold fairness and accountability in the bidding process. Reforming supplier evaluation practices is necessary to address inefficiencies. Simplifying evaluation criteria and reducing unnecessary documentation requirements can help accelerate procurement processes. A shift towards performance-based assessments rather than excessive compliance-based evaluations can enhance project outcomes. The findings indicate that supplier qualification screening and competitive bidding significantly contribute to the efficiency of public project execution, while overly stringent supplier evaluation processes negatively impact performance. These insights provide a foundation for policy recommendations aimed at enhancing public procurement practices. Addressing the challenges in supplier evaluation and leveraging digital procurement tools can improve efficiency and ensure that public projects are successfully implemented. Further research is needed to explore alternative supplier evaluation models that balance quality assurance with operational efficiency.

Null Hypothesis (H0): Supplier qualification screening (SQS) has no significant influence on the performance of public projects in the selected Ministries. Alternative Hypothesis (H1): Supplier qualification screening (SQS) has a significant influence on the performance of public projects in the selected Ministries. The SEM results provided strong evidence against the null hypothesis, as the coefficient for SQS was significant ($0.93, p < 0.05$) and positive. Therefore, the study confirmed the alternative hypothesis (H1), indicating that effective supplier qualification screening significantly influences and contributes to the performance of public projects. Null Hypothesis (H0): Competitive bidding (CB) has no significant influence on the performance of public projects in the selected Ministries. Alternative Hypothesis (H1): Competitive bidding (CB) has a significant influence on the performance of public projects in the selected Ministries. The SEM findings strongly rejected the null hypothesis, with a significant and positive coefficient for CB ($1.59, p < 0.05$). This supported the alternative hypothesis (H1), indicating that competitive bidding significantly influences and positively contributes to the performance of public projects. Null Hypothesis (H0): Supplier evaluation (SE) has no significant influence on the performance of public projects in the selected Ministries. Alternative Hypothesis (H1): Supplier evaluation (SE) has a significant influence on the performance of public projects in the selected Ministries. Surprisingly, the SEM results revealed a significant negative coefficient for SE ($-1.58, p < 0.05$), contrary to the study's hypothesis. Therefore, the null hypothesis was rejected, suggesting that the stringent supplier evaluation negatively influences project performance. This unexpected result calls for further investigation into the specific aspects of supplier evaluation that may contribute to this negative impact.

The goodness-of-fit statistics from the SEM analysis provided assurance of the model's appropriateness for the data. The chi-square tests and other fit indices (CFI, TLI, SRMR) indicated a well-fitting model. The population error assessment (RMSEA = 0.00, $p_{close} = 1.000$) further supported the model's validity. These findings suggest that the proposed conceptual framework effectively captures the relationships between the latent variables and aligns with the observed data, providing confidence in the study's overall conclusions. In summary, the hypotheses testing results align with the SEM findings, confirming the significant influence of both supplier qualification screening (SQS) and competitive bidding (CB) on public project performance. However, the unexpected negative impact of supplier evaluation (SE) prompts further exploration and refinement of evaluation processes. The study's outcomes provide valuable insights for policymakers and practitioners in enhancing public procurement practices for optimal project success.

Discussion

The analysis of the effects of supplier qualification screening (SQS) on the overall performance of public projects revealed substantial support for the positive influence of effective supplier qualification processes. The Structural Equation Modeling (SEM) results demonstrated a significant and positive coefficient ($0.93, p < 0.05$) for SQS, aligning with the study's hypothesis. This suggests that transparent, thorough, and regulated supplier screening practices play a pivotal role in enhancing project performance. These findings resonate with existing literature, as highlighted by Kipchilat (2016), who emphasized the importance of supplier qualification

screening in mitigating risks associated with non-compliant suppliers. The study's outcomes affirm the critical role of SQS in shaping the trajectory of public projects, providing empirical evidence that supports the assertions made in prior research. Furthermore, the mean score of 2.56 for SQS in the survey responses indicates a general inclination towards agreement among respondents with the effectiveness of supplier qualification screening processes. The moderate standard deviation suggests some variability in perspectives, emphasizing the need for a nuanced understanding of stakeholders' views. This aligns with the findings of Kipchilat (2016), who acknowledged the diverse challenges in supplier qualification across different organizational contexts. Therefore, while SQS emerges as a positive contributor to project success, it is crucial for policymakers to consider the varied perspectives within the surveyed population for more tailored and effective implementation.

The examination of the effects of competitive bidding (CB) on public project performance unveiled compelling insights into the significance of fair, competitive, and efficient bidding processes. The SEM results indicated a substantial positive coefficient (1.59, $p < 0.05$) for CB, supporting the study's hypothesis and emphasizing the crucial role of competitive bidding practices in positively influencing project outcomes. This finding aligns with the empirical research of Julius and Gershon (2019), who concluded that competitive tendering provides value for money due to its efficiency and fairness in project procurement. The outcomes of this study contribute empirical evidence to the existing body of literature, reinforcing the positive impact of competitive bidding on public project success. Moreover, the mean score of 2.648 for CB in the survey responses signifies a prevalent agreement among respondents with statements related to competitive bidding. The relatively low standard deviation implies a more consistent consensus on the positive impact of competitive bidding processes on public project performance. This consensus is in line with the findings of Owiti (2017), who highlighted the importance of control, regulations, and assurance in ensuring the successful completion of construction projects. Policymakers and practitioners can draw on these consistent perspectives to reinforce and further optimize competitive bidding practices within public procurement processes.

Contrary to expectations, the analysis of the effects of supplier evaluation (SE) on project performance yielded an unexpected result. The SEM model indicated a significant negative coefficient for SE (-1.58, $p < 0.05$), challenging the study's hypothesis and suggesting that stringent supplier evaluation negatively influences project performance. This finding prompts critical considerations for policymakers and practitioners, as it raises questions about potential unintended consequences of rigorous evaluation processes. The unexpected negative impact of SE contrasts with the literature, such as Jap (2013), who found that organizations opting for suppliers with strong technical capabilities experienced improved performance. The mean score of 2.728 for SE in the survey responses indicates an overall agreement with assertions about the effectiveness of supplier evaluation in contributing to public project success. However, the moderate standard deviation suggests some variability in responses, emphasizing the diverse opinions within the surveyed population. This variability requires careful attention, as it may signify nuanced challenges or concerns that need to be addressed in the design and implementation of supplier evaluation processes. Policymakers and practitioners should conduct further investigation into the specific aspects of supplier evaluation that may lead to negative consequences and work towards refining these processes for optimal project success.

The hypotheses testing results affirmed the significant influence of both supplier qualification screening (SQS) and competitive bidding (CB) on public project performance. The rejection of the null hypotheses for SQS and CB, along with the positive coefficients, aligns with the SEM findings and provides robust empirical support for the study's hypotheses. However, the unexpected negative impact of supplier evaluation (SE) necessitates a cautious interpretation and emphasizes the need for further exploration and refinement of evaluation processes. The goodness-of-fit statistics from the SEM analysis provide confidence in the overall validity of the proposed model. The chi-square tests, fit indices (CFI, TLI, SRMR), and error metrics collectively support the appropriateness of the conceptual framework in capturing the relationships between latent variables. Policymakers and practitioners can rely on these findings to guide evidence-based decisions in optimizing public procurement practices for enhanced project success. The study's outcomes contribute to the ongoing discourse on effective procurement strategies within the public sector and offer valuable insights for shaping policies and practices that align with the dynamic needs of project management.

Conclusion

This study rigorously evaluated the impact of public procurement procedures on the efficacy of public projects in Zambia, concentrating on the Ministry of Infrastructure, Housing and Urban Development (MIHUD) and the Ministry of Local Government and Rural Development (MLGRD). The principal findings indicate that Supplier Qualification Screening (SQS) and Competitive Bidding (CB) markedly improve the efficacy of public projects, according with the research objectives established. The study revealed an unforeseen adverse effect of Supplier assessment (SE) on project outcomes, indicating that rigorous assessment processes may unintentionally obstruct project success.

The Structural Equation Modelling (SEM) research yielded compelling evidence for the beneficial impacts of both SQS and CB, while also underscoring the necessity for a more sophisticated approach to supplier evaluation methods. These findings provide significant insights for policymakers, indicating that public procurement processes might be enhanced to increase project success.

This study recommends:

- i. To mitigate the adverse effects of excessively rigorous supplier assessments, it is advisable to refine the evaluation criteria to emphasise essential performance measures that significantly enhance project success. Evaluation procedures should prioritise flexibility and practicality to prevent dissuading competent vendors.
- ii. The adoption of e-procurement platforms can improve openness, efficiency, and accessibility in the procurement process. This advice corresponds with global trends in procurement digitisation, which have shown the capacity to lower prices, diminish corruption risks, and enhance overall procurement efficiency. Enhance
- iii. It is essential to invest in ongoing training and capacity development for procurement authorities and suppliers. Enhancing the knowledge base about procurement processes, namely SQS and CB, will facilitate improved decision-making quality and augment the overall efficacy of procurement methods.
- iv. Fortifying regulatory oversight in the procurement process would guarantee compliance with guidelines, reduce inefficiencies, and assure the execution of high-quality public projects. Regular audits, performance assessments, and transparent reporting systems must be instituted to promote accountability.
- v. The government should incorporate contemporary research and best practices from both developed and emerging nations about procurement efficiency and digitalisation. This integration would yield significant insights into the implementation of procurement reforms to enhance the results of public projects.
- vi. Policymakers should contemplate implementing changes designed to enhance competition, alleviate obstacles in supplier selection, and guarantee that procurement decisions adhere to explicit, consistent, and transparent standards. This may involve changing the Supplier Qualification Screening and Supplier Evaluation procedures to achieve a balance between rigour and flexibility.

In conclusion, whereas SQS and CB enhance public project performance, the adverse effects of SE necessitate additional scrutiny and modifications. Executing the aforementioned recommendations will enhance the efficiency and efficacy of the public procurement process, consequently augmenting the performance of public projects in Zambia.

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