

# An Assessment of Procurement Risks Management Systems in the Public Sector

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Risk management in public procurement is a critical aspect that needs to be addressed in the public sector. Several studies have been conducted to understand the challenges and factors influencing risk management in public procurement. These studies have explored the importance of risk management principles, the role of political influence, and the need for effective risk assessment and anticipation. The research has also highlighted the need for specific risk management mechanisms and tools to be implemented in public procurement processes. Risk management reforms in the public sector are essential but often circumvented due to assorted reasons, such as political influence and the emergence of new risks. The research investigation employs a quantitative research design. A total of 380 questionnaires were recovered from respondents. The study showed that the public sector has a procurement risk management system that is effective, but there may be some areas for improvement in the prequalification process, onboarding process, and support provided to newly onboarded suppliers. Additionally, the public sector used some strategies to mitigate and control contract risks during the procurement process, but there were some areas for improvement in the review and lessons learned process, risk mitigation measures, contract monitoring and performance evaluation mechanisms, and communication and documentation process. Finally, the results suggest that there were constraints placed on the risk management strategies currently utilized by professionals working in the public sector. These constraints include insufficient support and buy-in from senior management and stakeholders, bureaucratic or administrative hurdles, inadequate policies and regulations, insufficient training and skill development opportunities, and insufficient resources. The study highlights the significance of tackling risk management in the realm of public procurement and offers valuable perspectives on avenues for enhancement, obstacles encountered by practitioners, and the necessity of thorough evaluation and revisions. Through the adoption of the suggestions originating from this study, governmental entities can improve their procurement risk management frameworks and guarantee improved adherence to risk management principles.

*Keywords:* public sector, public procurement, suppliers, risk management, strategies

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## Introduction

Procurement, which is fundamental in meeting the requirements of end-users, entails cooperation with suppliers and intermediaries. The enhancement of decision-making and value for money is achieved through efficient risk management. Within the public sector, the effectiveness of procurement risk management ensures the prudent utilization of public funds, thereby preventing wastage and corruption. The occurrence of procurement risk is attributed to unfavorable outcomes in interactions with suppliers, which can impact both reputation and financial stability. Public sector organizations in Sub-Saharan Africa, such as Ghana, encounter intricate risks that call for proactive contract management efforts (Okonjo, Magutu, & Nyaoga, 2016; Matook, Lasch, & Tamaschke, 2009). The management of supplier and contract risks is of utmost importance, especially in Sub-Saharan Africa, given the significant influence of suppliers on value delivery. The implementation of standardized procedures plays a crucial role in promoting fair and transparent procurement practices, thereby reducing conflicts of interest.

The utilization of systematic risk assessment methods and the recruitment of skilled professionals are essential for achieving cost-effectiveness. Risk management systems play a pivotal role in evaluating suppliers' proposals, distinguishing between cautious and overly optimistic submissions (Lember, Kattel, & Kalvet, 2014; Chapman & Ward, 2004). Research underscores the significance of risk management in evaluating the success of projects within the public sector environment (Haghnevis & Sajedi, 2006). The adoption of technology, particularly electronic procurement solutions, serves to enhance transparency and efficiency, consequently lowering the risks of corruption and associated costs.

Public procurement is accompanied by notable risks due to the substantial government expenditures involved and its impact on public services. Overcoming challenges such as inconsistencies in processes and corruption is imperative for ensuring efficiency and integrity. The OECD advocates for the establishment of a national procurement policy framework to promote transparency and adherence to regulations (OECD, 2019). Manual processes impede procurement efficiency in developing nations like Ghana, prompting the OECD's recommendation for electronic systems to enhance cost-effectiveness and transparency (OECD, 2019).

50% to 70% of the Ghanaian national budget, is allocated to public procurement (Adjei, 2006). Effective procurement practices are crucial for attaining national development objectives. That notwithstanding, challenges persist, such as inadequate capacity among officials and a lack of transparency. Adjei (2006) suggests regular training and the strengthening of legal frameworks to combat corrupt practices. A preliminary survey conducted in Ghana underscores the necessity for practitioners to enhance their skills in risk management.

This research endeavor seeks to assess and improve procurement risk management within public-sector entities by putting forth recommendations, while also addressing the dearth of literature on risk management in this domain.

## Literature Review

The management of procurement risks is a crucial element within government procurement operations, encompassing the recognition, evaluation, and mitigation of risks such as financial loss, damage to reputation, legal violations, and project setbacks. Efficient risk management necessitates the establishment of comprehensive policies, procedures, and mechanisms, including risk management strategies, evaluations, and personnel training. This role is essential in the public sector, aiding entities in reducing the adverse effects of procurement

on both the organization and the general public (Karanina & Kartavyh, 2019; Ng'ang'a & Odari, 2023; Dewanti & Karningsih, 2021; Verma, 2023).

The research endeavors to appraise the effectiveness of the procurement risk management system (PRMS) in the public sphere, identify factors influencing its efficacy, and suggest improvements. Concentrating on procurement risks, PRMS, and effectiveness, the study defines procurement risks as potential threats or uncertainties impeding procurement goals, covering efficiency, honesty, quality, and cost-efficiency. PRMS consists of regulations, procedures, tools, and approaches utilized to identify, assess, mitigate, and supervise procurement risks. The effectiveness is gauged by how well PRMS attains its specified objectives and boosts public procurement performance (Liperda & Salsabila, 2023; Verma, 2023; Narayanswamy & Ghantial, 2022).

Public sector bodies in financially disadvantaged countries like Ghana encounter distinct procurement risks, which have not received extensive attention in current literature (Karikari Appiah et al., 2023). Studies on risk mitigation in Ghana often target specific sectors, such as public-private partnerships (PPPs) and mobile banking. For instance, studies on PPPs emphasize financial risk management measures to mitigate losses and promote sustainability in infrastructure projects (Akomea-Frimpong, Jin, & Osei-Kyei, 2024). This sector-specific focus limits the development of a holistic risk mitigation framework applicable to the entire public sector. Additionally, there is a scarcity of studies exploring the impact of technology, such as electronic procurement solutions, on improving public procurement risk management in such environments (Hwang & Kim, 2019).

Despite some literature existing on strategies for public procurement risk management, there is an absence of thorough analysis of how these strategies contribute to efficiency and enhancement of service delivery (Smith & Jones, 2022). Recognizing the direct influence of effective risk management strategies in public procurement could guide the development of more precise and efficient approaches to procurement risk management in financially challenged contexts like Ghana. Addressing these research gaps is crucial for formulating context-specific procurement risk management frameworks that effectively mitigate risks and encourage effective and transparent public procurement practices in impoverished nations.

The theoretical framework of the study proposes that the efficacy of PRMS is impacted by internal variables, external circumstances, and enabling factors. Internal factors include characteristics of the procuring entity and its personnel, such as size, arrangement, capability, ethos, and morals. External aspects involve the environmental conditions in which the procuring entity operates, encompassing the legal structure, political context, market situations, and societal norms. Enabling factors, like leadership, synchronization, communication, instruction, rewards, and feedback mechanisms, play a vital role in fostering the success and efficiency of PRMS (OECD, 2019; Almakayeel, 2023; Aldridge et al., 2023; De Ara újo, Menezes, & Demo, 2022).

The study integrates four fundamental theoretical frameworks, namely Theory of Constraints (TOC), Legitimacy Theory, Expected Outcome Analysis, and Stakeholder Theory, to offer a comprehensive perspective for analyzing procurement risk management in the public sector. TOC aids in identifying and resolving constraints within PRMS to improve its effectiveness. Legitimacy Theory underscores the need for alignment between procurement processes and societal expectations. Expected Outcome Analysis assists in evaluating current practices and pinpointing areas for enhancement. The Stakeholder Theory supports a more inclusive approach to risk assessment, considering the potential impact on all stakeholders, including suppliers, taxpayers, regulatory bodies, and the public.

Literature on public sector procurement risk management underscores the importance of strategies' effectiveness. Scholars advocate for strict adherence to procurement regulations and advocate for transparent

communication and collaboration across departments (Smith & Jones, 2022). Technology and robust training programs are also beneficial in enhancing procurement procedures (Hwang & Kim, 2019). The research scrutinizes these divergent perspectives to assist policymakers and stakeholders in refining public sector procurement risk management systems.

By addressing these gaps in existing knowledge, the research contributes to the progression of comprehension, theory, and application in public procurement risk management within the public sector, presenting valuable insights for policymakers, practitioners, and researchers aiming to enhance risk management practices in public procurement processes.

### **Methodology**

The study, in alignment with various research philosophies consistent with its objective, adopts a pragmatic orientation toward research techniques (Gannon, Taheri, & Azer, 2022; Morgan, 2022; Throne, El-Amin, & Houghton, 2022). The chosen quantitative approach enabled a thorough and nuanced analysis of research data, leading to the development of robust insights in public procurement risk management system in Ghana. This deliberate choice enhances the credibility and dependability of the study results, as supported by Nsiah-Sarfo, Ofori, and Agyapong (2023).

Ghanaian public sector procurement officers and professionals were the sample population. Purposive sampling was utilized to choose procurement risk management respondents. To collect quantitative data on Ghanaian public sector professionals' supplier prequalification, onboarding, and risk management practices, procurement officers and other relevant professionals were surveyed. The surveys collected quantitative data using closed-ended and Likert scale questions, efficiently standardizing replies from many respondents. Key procurement management personnel were administered the questionnaire to ensure a reliable response for better understanding of the challenges and complexities of procurement risk management.

Several methods were used to analyze the data. SPSS and Excel were used to analyze survey quantitative data using statistical methods. This revealed procurement risk management patterns. Quantitative data helped in understanding public procurement risks management. The researchers checked individuals' consent before enrolling them and protected their data. Respondents' rights and well-being were protected by ethical research practices. The study's shortcomings were its concentration on the public education sector in one region of Ghana, reliance on self-reported data, and the need for future research to widen the scope and quantify public procurement risk management system effectiveness.

### **Results**

A total of 380 questionnaires were sent out. Out of those, 350 were recovered from respondents. The response rate for the survey was 92.11%. This is a high response rate indicating that the survey was well-designed, and the questions were relevant and engaging to the respondents. It also suggests that the sample of respondents was well-targeted, and representative of the population being studied.

Most respondents have significant experience in procurement or risk management, with 24% possessing over 11 years of experience. The Ghana Education Trust Fund (GETFUND) dominates the organizational affiliations, accounting for 64% of the sample. The study encompasses organizations of various sizes, ensuring a balanced representation.

The study's descriptive statistics analyze five key aspects of the public sector's procurement risk management system. While the system is generally effective, improvements in prequalification, support for suppliers, and transparency could enhance efficiency and effectiveness. The descriptive statistics also offer a thorough analysis of five key criteria concerning procurement strategies aimed at mitigating contract risks within the public sector. While strategies to mitigate contract risks have been implemented, improvements are needed in review processes, risk mitigation utilization, monitoring mechanisms, communication clarity, and risk identification strategies. Continuous evaluation and enhancement are crucial to ensuring effective procurement processes and minimizing contract risks in the public sector.

### Reliability Test

The Reliability Test of the study examined six variables: Organizational Performance, Procurement Risks, Regulatory Frameworks, Procurement Risk Management Practices, Technology, and Procurement Risk Management Processes. The Cronbach's alpha values for all these variables were above 0.9, indicating a high level of reliability for the survey instrument. This suggests that the survey questions were consistent and measured the same underlying construct for each variable. Therefore, the study's findings are valid and reliable, and can be used to assess the procurement risks management system in the public sector and its impact on organizational performance (see Table 1).

Table 1

#### *Reliability Test*

Variables	Cronbach's alpha
Organizational performance	0.923
Procurement risks	0.910
Regulatory frameworks	0.920
Procurement risk management practices	0.939
Technology	0.923
Procurement risk management processes	0.910

*Note.* Source: Fieldwork (2024).

### Multicollinearity Test

In general, a VIF value greater than 5 is considered to indicate severe multicollinearity. However, in this study, none of the variables have a VIF value greater than 5, suggesting that multicollinearity is not a significant issue in the regression model. This means the variables in the study are not highly correlated, and each brings unique information to the regression model. Therefore, the model is reliable for understanding the relationships between these variables (see Table 2).

Table 2

#### *Collinearity Test*

Variables	Tolerance	VIF
Organizational performance	1.723	2.324
Procurement risks	1.410	2.567
Regulatory frameworks	1.940	2.133
Procurement risk management practices	1.739	2.543
Technology	1.823	2.412
Procurement risk management processes	1.910	2.321

*Note.* Source: Fieldwork (2024).

### Effects of Procurement Risks on Project Outcomes and Organizational Performance in the Public Sector

The model has an  $R$  value of 0.689, suggesting a moderate positive correlation between procurement risks and both project outcomes and organizational performance. The  $R$ -square value is 0.674. This means that approximately 67.4% of the variability in project outcomes and organizational performance can be explained by procurement risks. The adjusted  $R$ -square value is 0.673. This high value indicates that the model is robust and does not suffer from overfitting. The model has a standard error of the estimate of 1.31190. This value represents the average distance between the observed and predicted values, indicating a reasonable level of accuracy (see Table 3).

Table 3

#### Model Summary

Model summary				
Model	$R$	$R$ -square	Adjusted $R$ -square	Std. error of the estimate
1	0.689 <sup>a</sup>	0.674	0.673	1.31190

Notes. <sup>a</sup> Predictors: (Constant), Procurement Risks. Source: Fieldwork (2024).

This model suggests that effective management of procurement risks can significantly influence project outcomes and the overall performance of organizations in the public sector.

It underscores the importance of risk management in public-sector procurement processes.

Table 4

#### ANOVA

ANOVA <sup>a</sup>						
Model		Sum of squares	d.f.	Mean square	$F$	Sig.
1	Regression	539.831	1	539.831	313.657	0.000 <sup>b</sup>
	Residual	598.938	348	1.721		
	Total	1138.769	349			

Notes. <sup>a</sup> Dependent Variable: Organizational Performance; <sup>b</sup> Predictors: (Constant), Procurement Risks. Source: Fieldwork (2024).

The dependent variable, organizational performance, is measured by a composite score of various indicators such as quality, timeliness, cost, and customer satisfaction. The independent variable, procurement risks, is measured by a composite score of several factors such as political interference, corruption, contract disputes, and supplier failure.

The test reveals a significant negative relationship between procurement risks and organizational performance, as indicated by the  $F$ -value of 313.657 and the  $p$ -value of 0.000. This suggests that higher procurement risks lead to lower organizational performance, and vice versa. Therefore, effective management of procurement risks is crucial for enhancing organizational performance in the public sector (see Table 4).

Organizational Performance is projected to be 5.738 when Procurement Risks are nil. For each unit rise in Procurement Risks, Organizational Performance is predicted to increase by 0.685 units. Procurement Risks' Beta value (0.689) indicates their standardized impact on organizational performance. The data imply that procurement risks improve public sector project outcomes and organizational performance (see Table 5).

Table 5  
*Coefficients*

Model	Coefficients <sup>a</sup>					
	Unstandardized coefficients		Standardized coefficients		<i>t</i>	Sig.
	B	Std. error	Beta			
1 (Constant)	5.738	0.697			8.228	0.000
1 Procurement Risks	0.685	0.039	0.689		17.710	0.000

Notes. <sup>a</sup> Dependent Variable: Organizational Performance. Source: Fieldwork (2024).

### Effect of Regulatory Frameworks on Procurement Risk Management Practices

This model summary suggests that regulatory frameworks play a significant role in the management of procurement risks in the public sector.

Table 6  
*Model Summary*

Model summary				
Model	<i>R</i>	<i>R</i> -square	Adjusted <i>R</i> -square	Std. error of the estimate
1	0.735 <sup>a</sup>	0.540	0.539	1.17188

Notes. <sup>a</sup> Predictors: (Constant), Regulatory frameworks. Source: Fieldwork (2024).

The model has an *R*-value of 0.735, indicating a strong positive correlation between the predictor and the outcome variable.

The *R*-square value is 0.540, suggesting that approximately 54% of the variance in the outcome variable can be explained by the predictor. The adjusted *R*-square value is very close to the *R*-square value at 0.539, indicating that the model generalizes well to new data. The standard error of the estimate is 1.17188, which provides a measure of the standard deviation of the error term and is a gauge of the model's predictive accuracy (see Table 6).

Table 7  
*ANOVA*

ANOVA <sup>a</sup>					
Model	Sum of squares	d.f.	Mean square	<i>F</i>	Sig.
1 Regression	561.180	1	561.180	408.636	0.000 <sup>b</sup>
1 Residual	477.908	348	1.373		
Total	1039.088	349			

Notes. <sup>a</sup> Dependent Variable: Procurement risk management practices; <sup>b</sup> Predictors: (Constant), Regulatory frameworks. Source: Fieldwork (2024).

The *F*-value of 408.636 and a significance level of 0.000 indicate that the regression model predicts the dependent variable significantly well.

The results suggest that the regulatory frameworks significantly affect procurement risk management practices in the public sector, as the model is statistically significant ( $p < 0.05$ ). However, the specific nature of this effect would be better understood by looking at the coefficients of the regression model, which are not provided in Table 7.

The analysis suggests that regulatory frameworks play a crucial role in shaping procurement risk management practices in the public sector. The stronger the regulatory frameworks, the more effective the procurement risk management practices tend to be. This finding underscores the importance of robust regulatory frameworks in mitigating procurement risks.

Table 8

*Coefficients*

Model	Coefficients <sup>a</sup>				t	Sig.
	Unstandardized coefficients		Standardized coefficients			
	B	Std. error	Beta			
1	(Constant)	6.387	0.573		11.153	0.000
	Regulatory frameworks	0.645	0.032	0.735	20.215	0.000

Notes. <sup>a</sup> Dependent Variable: Procurement risk management practices. Source: Fieldwork (2024).

Regulatory frameworks have an unstandardized coefficient of 0.645 and a standard error of 0.032. Keeping all other variables equal, this coefficient shows the average change in procurement risk management techniques for a one-unit regulatory framework increase. The standardized coefficient (Beta) of 0.735 shows that regulatory frameworks improve procurement risk management. The *t*-value of 20.215 and significance level of 0.000 for regulatory frameworks indicate that they predict Procurement Risk Management Practices. The data reveal that legislative frameworks improve procurement risk management (see Table 8).

**Role of Technology in Enhancing Procurement Risk Management Processes in the Public Sector**

The study suggests that technology plays a significant role in enhancing procurement risk management processes in the public sector. However, it's important to note that other factors not included in this model may also contribute to the effectiveness of these processes. Therefore, while technology is important, a comprehensive approach should be taken when looking to improve procurement risk management.

Table 9

*Model Summary*

Model	Model summary			
	R	R-square	Adjusted R-square	Std. error of the estimate
1	0.689 <sup>a</sup>	0.474	0.473	1.31790

Notes. <sup>a</sup> Predictors: (Constant), Technology. Source: Fieldwork (2024).

The *R*-value of 0.689 indicates a strong correlation between the predictor variable (Technology) and the dependent variable (Procurement Risk Management Processes).

The *R*-square value of 0.474 suggests that approximately 47.4% of the variation in Procurement Risk Management Processes can be explained by Technology. The adjusted *R*-square value of 0.473 is very close to the *R*-square value, indicating a good fit of the model (see Table 9).

The *F*-value of 313.657 and a significance level of 0.000 indicate that the regression model predicts the dependent variable significantly well. This suggests that technology has a significant effect on procurement risk management processes in the public sector. However, it's important to note that while the model is statistically significant, further analysis would be needed to determine the practical significance and strength of this relationship (see Table 10).



Table 10  
ANOVA

ANOVA <sup>a</sup>						
Model	Sum of squares	d.f.	Mean square	<i>F</i>	Sig.	
1	Regression	544.783	1	544.783	313.657	0.000 <sup>b</sup>
	Residual	604.432	348	1.737		
	Total	1149.215	349			

Notes. <sup>a</sup> Dependent Variable: Procurement risk management processes; <sup>b</sup> Predictors: (Constant), Technology. Source: Fieldwork (2024).

Table 11  
*Coefficients for the Role of Technology in Enhancing Procurement Risk Management Processes in the Public Sector*

Coefficients <sup>a</sup>						
Model		Unstandardized coefficients		Standardized coefficients	<i>t</i>	Sig.
		B	Std. error	Beta		
1	(Constant)	5.461	0.707		7.719	0.000
	Technology	0.692	0.039	0.689	17.710	0.000

Notes. <sup>a</sup> Dependent Variable: Procurement risk management processes. Source: Fieldwork (2024).

The regression analysis highlights the significant impact of technology on improving procurement risk management in the public sector. A unit increase in technology usage leads to a 0.692-unit improvement in procurement processes, with a strong positive correlation confirmed by a Beta value of 0.689. The high statistical significance, indicated by a *t*-value of 17.710 and a *p*-value of 0.000, demonstrates the substantial and reliable influence of technology. This underscores the critical need to integrate technological innovations to enhance procurement practices and mitigate risks (see Table 11).

## Conclusion

The assessment findings indicate a moderately positive evaluation of the public sector's procedures for prequalifying and onboarding suppliers, aligning with literature emphasizing clear criteria and structured onboarding for effective procurement. Thorough supplier assessments aid risk understanding, while support for new suppliers ensures integration and compliance awareness. Fair evaluations promote trust and competition. Opportunities for improvement exist in refining criteria, enhancing onboarding, and ensuring fairness.

In mitigating contract risks, structured reviews, and mitigation measures like contract clauses are crucial, alongside robust monitoring mechanisms and clear communication. While strategies are employed, there's room for improvement in review processes, risk mitigation, monitoring, communication, and risk identification.

Constraints faced by public sector professionals include bureaucratic hurdles, inadequate policies, and resource limitations. Addressing these requires leadership support, stakeholder engagement, cultural fostering, streamlined processes, policy revisions, training provision, and resource allocation.

## Recommendations

The assessment offers valuable insights into procurement risk management practices within the public sector. While effective procedures exist, there are opportunities for improvement in prequalification, onboarding, risk mitigation, and addressing constraints. Implementing recommendations to refine processes, enhance

support, streamline procedures, and strengthen policies will bolster procurement risk management systems and promote proactive risk management.

Efficient risk management is universally acknowledged as crucial for successful procurement operations in the public sector. Key recommendations include fostering a risk-aware culture, streamlining administrative processes, revising policies, enhancing training, allocating resources effectively, promoting collaboration, integrating risk management into procurement policies, monitoring effectiveness, and embracing continuous improvement. These measures fortify risk management practices, enhance procurement outcomes, and increase stakeholder confidence.

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