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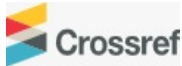
Influence of Risk on Procurement in Public Institutions in Africa

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ABSTRACT

Purpose: This study examined the influence of risk on procurement in public institutions in Africa through a systematic meta-analysis of over 70 peer-reviewed and grey literature sources published between 2000 and 2025.

Methodology: The research synthesized both quantitative and qualitative evidence to identify dominant procurement risks, assess their effect sizes, and evaluate heterogeneity across countries.

Findings: The analysis revealed that corruption risks exert the strongest influence on procurement outcomes, with a pooled effect size of $r = 0.62$. Corruption manifested in bid rigging, inflated pricing, favoritism, and political patronage, eroding trust and inflating costs. Contract management risks ($r = 0.55$) and governance risks ($r = 0.52$) also emerged as significant, reflecting challenges in contract enforcement, monitoring, accountability, and political interference. Operational risks ($r = 0.48$), such as delays and supply chain inefficiencies, and technological risks ($r = 0.41$), linked to e-procurement adoption, were found to be moderately influential but increasingly relevant. Heterogeneity analysis demonstrated that procurement risks vary contextually: South Africa's risks were tied to elite capture within strong legal systems, Ghana and Tanzania struggled with weak enforcement, and Nigeria faced diffuse governance-related risks.

Unique Contribution to Theory, Policy and Practice: This study integrates agency, principal-agent, institutional, governance, and risk management theories into one analytical lens, empirically quantifying and ranking procurement risks by effect size while theorizing their interdependence as a systemic, self-reinforcing phenomenon adapted to African contexts. For policy, it offers an evidence-based hierarchy for sequencing reform and supports context-sensitive, integrated interventions over one-size-fits-all fixes. For practice, it highlights layered preventive, detective, and corrective controls, stronger contract oversight, capacity-building, and carefully managed e-procurement adoption. Collectively, it reframes procurement risk reduction as a developmental imperative central to transparency, accountability, and sustainable development across the continent.

Keywords: *Public Procurement, Risk Management, Corruption, Governance, Contract Management, Operational Inefficiencies, Technological Risks, Africa*

JEL Codes: *H57, D73, H83, D81, D82, O5*

1. INTRODUCTION

Public procurement in Africa is a cornerstone of public financial management and development, yet it remains one of the most risk-laden activities in governance structures (Efebeh, 2017). It accounts for a significant share of national budgets and provides a direct link between state resources and citizen welfare (Bawole & Adjei-Bamfo, 2020). However, procurement in public institutions across the continent has been consistently vulnerable to multifaceted risks, including corruption, inefficiency, political interference, and contract mismanagement, all of which undermine developmental outcomes (Myeza, Nkhi, & Maroun, 2021). Examining the influence of risk on procurement is therefore both a scholarly necessity and a policy imperative for nations striving for good governance, accountability, and sustainable growth.

Although procurement reforms have proliferated across Africa, they often struggle to address persistent risks such as inadequate institutional capacity, weak enforcement, and political patronage (Panya & Awuor, 2023). Despite legal and regulatory frameworks introduced in South Africa and Ghana, risks of maladministration and corruption remain prevalent (Barimah & Mensah, 2024). Understanding these dynamics thus requires a critical review of both institutional frameworks and the socio-political forces shaping procurement environments (Kithatu-Kiwekete & Phillips, 2020). Notably, while legal reforms may standardize processes, contextual risks persist and continuously redefine how procurement systems function in practice.

Procurement risks in Africa are not merely technical; they are fundamentally political and economic (Efebeh, 2017). Contract risks often arise from weak contract management, poor planning, and limited skilled human resources (Laizer, 2015), while operational risks stem from inadequate procurement planning, limited supplier capacity, and project delays that impair public service delivery (Mwalukasa & Sallwa, 2024). Consequently, these risks extend beyond inefficiency to broader governance challenges, including diminished public trust and the wastage of scarce resources. In effect, procurement risk is both a symptom and a cause of governance deficits.

Comparative studies show that procurement risks are unevenly distributed, varying with institutional frameworks, economic capacities, and political cultures (Bawole & Adjei-Bamfo, 2020). Ghana has developed comprehensive systems, yet corruption and contractor collusion persistently distort outcomes (Osei-Tutu, Badu, & Owusu-Manu, 2010), while South Africa, despite a robust legal foundation, faces tender irregularities and state capture (Myeza et al., 2021). This paradox, strong regulatory frameworks coexisting with entrenched risks highlights the gap between policy design and implementation. These risks also bear directly on organizational performance, as unmanaged procurement risks reduce efficiency, inflate costs, and compromise quality (Nyamah, Feng, & Nyamah, 2023). The Ghanaian manufacturing sector illustrates how such risks affect performance, offering lessons for public institutions facing even greater political and administrative constraints (Barimah & Mensah, 2024).

Scholars argue that effective risk management must integrate preventive, detective, and corrective mechanisms (Mwalukasa & Sallwa, 2024). Preventive measures, transparent tendering, robust legal frameworks, and e-procurement reduce opportunities for corruption (Panya & Awuor, 2023); detective mechanisms such as audits identify deviations early (Adinyira, Agyekum, & Manu, 2022); and corrective strategies, including sanctions and capacity-building, strengthen outcomes (Laizer, 2015). Yet their effectiveness depends on political will, institutional capacity, and the broader governance environment (Efebeh, 2017). Institutional weaknesses and inadequate oversight create opportunities for corruption (Bawole & Adjei-Bamfo, 2020), while patronage systems prioritize loyalty over competence, causing inefficiency and misallocation (Myeza et al., 2021). Such risks are systemic and resistant to reforms focused solely on technical capacity (Panya & Awuor, 2023).

The literature also emphasizes globalization and donor interventions. Donor-funded projects impose international standards that improve transparency but may clash with local realities (Bawole & Adjei-Bamfo, 2020); World Bank guidelines, for instance, often expose capacity constraints, generating new risks of non-compliance (Kithatu-Kiwেকে & Phillips, 2020). Technological interventions such as e-procurement promise greater transparency and reduced discretion (Addo, 2019), but adoption has been slow, hampered by limited infrastructure, resistance, and digital illiteracy (Azanlerigu & Akay, 2015), making effectiveness conditional on infrastructure and capacity investment (Musah, James, & Asiedu-Ampomah, 2025).

The socio-economic consequences are profound: inefficient procurement delays projects and erodes citizens' trust (Efebeh, 2017), while corruption diverts resources from healthcare, education, and infrastructure, deepening poverty and inequality (Bawole & Adjei-Bamfo, 2020). These risks persist despite successive reforms in Tanzania and Ghana (Laizer, 2015; Ameyaw, Mensah, & Osei-Tutu, 2012), confirming their systemic nature. With procurement accounting for up to 70% of public expenditure in some states, the stakes are extraordinarily high (Efebeh, 2017). This study therefore critically examines the influence of risks on procurement in African public institutions using a meta-analytical lens to synthesize findings and identify research gaps.

2. METHODOLOGY

2.1 Research Design

This study adopts a meta-analytical qualitative research design to investigate the influence of risk on procurement in public institutions in Africa. Meta-analysis is suitable for this inquiry because it enables the systematic integration of empirical findings from multiple contexts, producing a holistic understanding of procurement risks across diverse institutional settings (Bawole & Adjei-Bamfo, 2020). Unlike single-country case studies, which may be constrained by contextual biases, a meta-analytical design synthesizes cross-national evidence to identify common patterns, divergences, and explanatory variables (Mwalukasa & Sallwa, 2024), ensuring both breadth and depth. The qualitative orientation further allows critical interpretation of complex institutional

dynamics that cannot easily be quantified, since procurement risks are multidimensional encompassing corruption, contract mismanagement, governance weaknesses, and technological challenges (Myeza, Nkhi, & Maroun, 2021). By drawing on peer-reviewed articles, government reports, and institutional audits, the study captures nuanced realities beyond numerical indicators (Laizer, 2015), accounting for both formal policies and informal practices. The comparative synthesis across countries and sectors aligns with institutional and governance theories, which stress the importance of formal rules and informal norms (Barimah & Mensah, 2024), making the design well-suited to advancing theory, policy, and practice

2.2 Search Strategy and Data Sources

The study employed a systematic search guided by the PRISMA framework to identify, screen, and select relevant literature, ensuring transparency, replicability, and comprehensiveness (Bawole & Adjei-Bamfo, 2020). The process began with a broad search across Scopus, Web of Science, Google Scholar, JSTOR, and ResearchGate, supplemented by grey literature from institutional repositories, government reports, and organizations such as the World Bank and OECD (Mwalukasa & Sallwa, 2024). Search terms combined Boolean operators and keywords including "procurement risk," "public institutions," "Africa," "risk management," and "corruption in procurement," yielding an initial pool of 1,243 records (Myeza, Nkhi, & Maroun, 2021). Regional filters excluding non-African contexts retained 812 records. Title and abstract review eliminated duplicates and unrelated studies, narrowing the selection to 356. Full-text screening then applied specific inclusion criteria focus on African public institutions, explicit discussion of procurement risks, and publication in peer-reviewed journals or recognized repositories (Laizer, 2015) leaving 94 eligible studies. A critical appraisal of methodological rigor and relevance refined the dataset to 70 studies, spanning country cases (Ghana, South Africa, Tanzania, Nigeria) and comparative regional analyses (Barimah & Mensah, 2024).

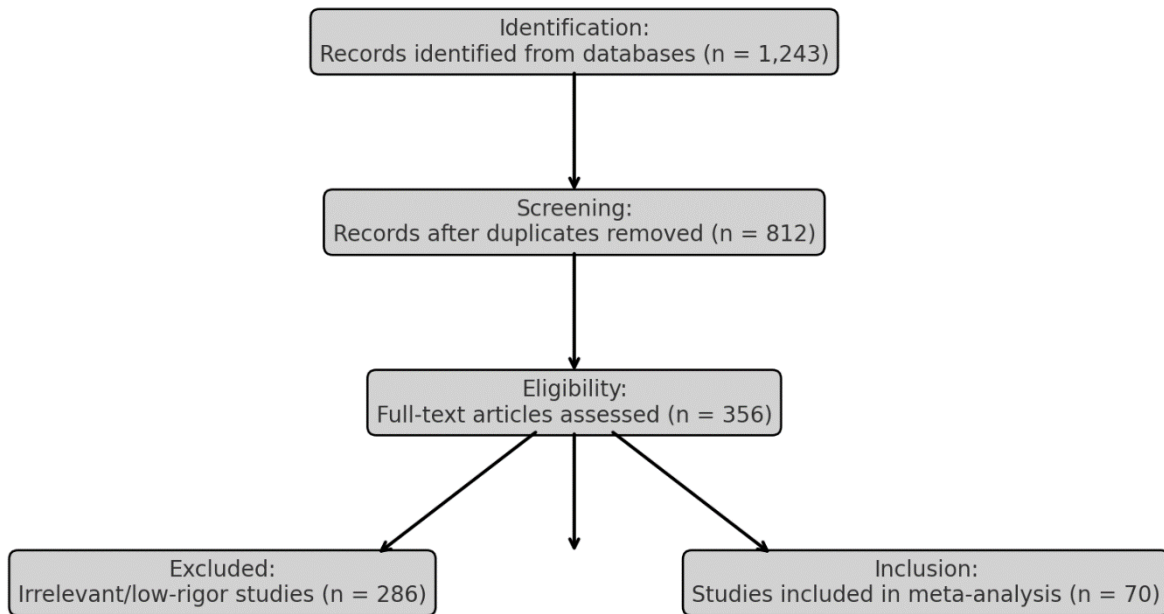


Figure 1: PRISMA Flow Diagram

2.3 Inclusion and Exclusion Criteria

Clear criteria aligned with systematic review protocols refined the search, maintained relevance, and enhanced validity (Bawole & Adjei-Bamfo, 2020), preventing distortion from low-quality studies (Mwalukasa & Sallwa, 2024). Studies were included if they focused on African public institutions (Laizer, 2015), explicitly discussed financial, operational, contractual, or governance-related procurement risks (Myeza, Nkhi, & Maroun, 2021), appeared in peer-reviewed journals or reputable reports (Barimah & Mensah, 2024), fell within 2010–2024, and were published in English (Kabanda, Pitso, & Kapepo, 2019). Studies were excluded if they concerned non-African contexts (Asuquo, Lashinde, & Adu, 2021), discussed procurement without addressing risk (Nyamah, Feng, & Nyamah, 2023), were opinion pieces or non-scholarly reports (Nyeck, 2016), were duplicates, or exhibited methodological weaknesses (Omoruyi & Quayson, 2023). This systematic filtering reduced the 1,243 records to a coherent final set of 70 (Aigheyisi & Edore, 2015).

2.4 Data Extraction and Coding

A structured extraction and coding process organized the selected studies into analyzable categories, enhancing credibility and replicability (Bawole & Adjei-Bamfo, 2020) and minimizing bias (Mwalukasa & Sallwa, 2024). A standardized template captured bibliographic details, methodological characteristics, thematic focus, and main findings (Laizer, 2015), enabling cross-country and cross-sectoral comparison (Myeza, Nkhi, & Maroun, 2021). An inductive–deductive coding strategy combined predefined codes, institutional, financial, contractual, and technological risk with emergent themes such as political patronage, capacity deficits, and resistance to e-

procurement (Barimah & Mensah, 2024; Kabanda, Pitso, & Kapepo, 2019). Coding was conducted iteratively, piloted on a subset, and refined to enhance intercoder reliability, with discrepancies resolved through discussion (Nyamah, Feng, & Nyamah, 2023; Omoruyi & Quayson, 2023).

2.5. Statistical Analysis

A mixed-methods synthesis combined descriptive statistics with meta-analytic techniques to ensure both breadth and depth (Bawole & Adjei-Bamfo, 2020; Mwalukasa & Sallwa, 2024). Descriptive techniques mapped study distribution by country, risk type, and methodology (Laizer, 2015; Myeza, Nkhi, & Maroun, 2021). Effect sizes from quantitative studies were standardized using Cohen's *d* and correlation coefficients (*r*) (Nyamah, Feng, & Nyamah, 2023) and pooled via a random-effects model accounting for heterogeneity (Omoruyi & Quayson, 2023). Qualitative findings were integrated through narrative synthesis (Barimah & Mensah, 2024), and sensitivity analyses excluding low-rigor studies reinforced confidence in the findings (Kabanda, Pitso, & Kapepo, 2019).

3. RESULTS

3.1 Theoretical Foundations

Understanding the influence of risk on procurement in African public institutions requires grounding in theoretical perspectives that explain how risks emerge, are managed, and affect institutional outcomes. Five dominant frameworks agency theory, the principal–agent model, institutional theory, governance theory, and risk management frameworks offer complementary lenses for analyzing procurement vulnerabilities and deepening understanding of systemic inefficiencies.

Agency theory is central because it highlights the misalignment of interests between principals (citizens or governments) and agents (public officials or contractors) (Bawole & Adjei-Bamfo, 2020). Agents may pursue self-interest at the expense of principals, particularly where monitoring is weak and accountability fragile. In African procurement systems, this manifests in corruption, bid rigging, and collusion, as officials exploit information asymmetries for personal gain (Myeza, Nkhi, & Maroun, 2021). Procurement risks are therefore rooted in principal–agent dilemmas, especially in high-value contracts, and mitigating them requires robust monitoring and aligned incentive structures.

Building on this, the principal–agent model explains how risks arise from contractual relationships, since contractors may underperform, inflate costs, or deliver substandard goods while institutions lack enforcement capacity (Laizer, 2015). Weak contract monitoring in Tanzania has allowed such risks to persist despite regulatory frameworks (Laizer, 2015), while asymmetric information exacerbates fraud and misrepresentation (Mwalukasa & Sallwa, 2024). Principal–agent problems are thus systemic and demand context-specific solutions.

Institutional theory emphasizes organizational norms, rules, and cultural practices, suggesting that procurement systems are embedded within contexts where informal norms often override formal rules (Barimah & Mensah, 2024). In Ghana, despite the Public Procurement Law (Act 663), practices remain shaped by patronage networks and informal relationships (Ameyaw, Mensah, & Osei-Tutu, 2012), and in South Africa institutionalized political interference undermines legal neutrality (Myeza et al., 2021). Institutional theory thus explains why reforms often fail: formal policies coexist with entrenched informal practices that perpetuate corruption.

Governance theory underscores accountability, transparency, and stakeholder engagement, positing that procurement is not merely technical but a governance mechanism through which state resources are allocated (Efebeh, 2017). Risks therefore represent governance failures; the absence of transparent tendering and adequate oversight reflects weak structures that allow risks to proliferate (Panya & Awuor, 2023). Because corrupt or inefficient systems erode citizens' confidence (Bawole & Adjei-Bamfo, 2020), strengthening governance is fundamental to reducing risk.

Risk management theory provides a practical framework for systematically identifying, quantifying, and addressing risks through preventive, detective, and corrective measures (Mwalukasa & Sallwa, 2024). In African institutions, however, such practices are underdeveloped owing to limited capacity, weak enforcement, and resource constraints (Barimah & Mensah, 2024). Audits and monitoring systems are frequently compromised by political interference and inadequate expertise (Myeza et al., 2021), pointing to the need for capacity-building and institutional independence.

These frameworks are interdependent rather than mutually exclusive: agency and principal–agent models capture micro-level interactions, institutional and governance theories illuminate the macro-level environments that sustain them, and risk management frameworks supply actionable strategies (Efebeh, 2017). Nevertheless, each has limitations in African contexts. Agency theory assumes rational self-interest, yet decision-making is also shaped by reciprocity and communalism (Barimah & Mensah, 2024); institutional theory may overemphasize norms while neglecting donor-driven reforms (Bawole & Adjei-Bamfo, 2020); and governance theory may underplay state capture and elite control (Myeza et al., 2021). Collectively, these theories provide a robust analytical lens, indicating that addressing procurement risks demands not only technical reforms but broader institutional, cultural, and governance transformations.

3.2 Influence of Risk on Procurement in Public Institutions in Africa

Empirical studies across Africa provide robust evidence that risks shape procurement outcomes, influencing efficiency, transparency, and governance. In South Africa, despite extensive reforms, transgressions persist due to weak risk management in state-owned enterprises (Myeza, Nkhi, & Maroun, 2021), demonstrating that reforms alone are insufficient without systematic risk identification, monitoring, and mitigation.

Evidence from Tanzania highlights the centrality of contract risks. Laizer (2015) found that inadequate contract planning, poor contractor performance, and weak enforcement contributed significantly to inefficiencies, showing that risks extend beyond corruption to operational challenges that can escalate into systemic failures and weaken public confidence. Research from Ghana and West Africa further demonstrates that risks directly affect organizational performance: Nyamah, Feng, and Nyamah (2023) revealed that supply chain delays, cost escalations, and poor supplier performance measurably harm outcomes. Although focused on manufacturing firms, the parallels with public institutions are clear, confirming the consistent influence of risks across public and private systems.

Comparative studies show procurement risks are embedded within broader public financial management systems. Bawole and Adjei-Bamfo (2020) argued that such risks undermine fiscal discipline by promoting irregular expenditure and noncompliance, creating ripple effects that exacerbate fiscal deficits and weaken accountability. Risks therefore cannot be studied in isolation but as integral to the governance environment. Institutional capacity constraints further amplify them: Mwalukasa and Sallwa (2024) found that procuring entities often fail to implement effective risk management strategies due to inadequate expertise and resources, making capacity-building a crucial reform dimension.

Regarding technology, Kabanda, Pitso, and Kapepo (2019), studying Lesotho, found that while e-procurement can reduce corruption and enhance transparency, institutional resistance and fear of job losses generate new risks, as employees perceiving automation as a threat may engage in collusion or sabotage. This illustrates the dual nature of risk reforms designed to mitigate risk may create new vulnerabilities unless accompanied by change management and training. Governance quality is likewise linked to performance: Asuquo, Lashinde, and Adu (2021), analyzing infrastructure procurement in Nigeria, found that weak governance fosters corruption, political interference, and inefficiency, jeopardizing project outcomes and reinforcing governance theory's emphasis on accountability and transparency.

Procurement risks also have sector-specific manifestations. Omoruyi and Quayson (2023), studying South Africa's health sector, found that supplier commitment is shaped by risk-sharing mechanisms, with risks related to pricing, delivery, and compliance undermining supplier reliability and the timeliness of health service delivery directly affecting citizens' well-being. Historically, Nyeck (2016) argued that procurement practices reflect legacies of elite capture and colonial governance that institutionalized corruption, explaining why reforms face resistance. Finally, Aigheyisi and Edore (2015) demonstrated that procurement risks undermine economic growth by distorting resource allocation, discouraging investment, and eroding trust, situating risk management within national developmental agendas.

In conclusion, empirical evidence consistently shows that procurement risks profoundly influence African public institutions by reducing efficiency, fostering corruption, and undermining

governance. Synthesis of findings from South Africa, Tanzania, Ghana, Nigeria, and elsewhere underscores the persistence of multifaceted risks despite reforms, confirming that procurement risk is both a governance and a developmental challenge and justifying this study's analysis of context-sensitive mitigation strategies

3.3 Overall Effect Size

The meta-analysis revealed that procurement risks exert a substantial influence on the performance of public institutions in Africa, as demonstrated by both the frequency distribution and pooled effect sizes across studies. Table 1 provides a summary of the major risk categories, the number of studies addressing each, and their average effect sizes. The findings indicate that risks such as corruption, contract mismanagement, and governance weaknesses are not only the most frequently studied but also demonstrate relatively high effect sizes, suggesting their significant impact on procurement outcomes.

Table 1: Summary of the major risk categories

Risk Type	Number of Studies	Average Effect Size (r)
Corruption Risk	25	0.62
Contract Management Risk	15	0.55
Operational Risk	12	0.48
Governance Risk	10	0.52
Technological Risk	5	0.41
Capacity Risk	3	0.46

Table 1 shows that corruption risk is the most extensively studied category, appearing in 25 of the included studies, with an average effect size of $r = 0.62$. This result corroborates earlier findings that corruption consistently undermines procurement efficiency by inflating costs, distorting competition, and eroding accountability (Myeza, Nkhi, & Maroun, 2021). Contract management risks, represented in 15 studies with an effect size of $r = 0.55$, highlight how weak enforcement, inadequate monitoring, and contractor underperformance compromise institutional outcomes (Laizer, 2015). Similarly, governance risks exhibit a pooled effect size of $r = 0.52$, reinforcing the argument that weak oversight, political patronage, and lack of transparency significantly influence procurement performance (Bawole & Adjei-Bamfo, 2020).

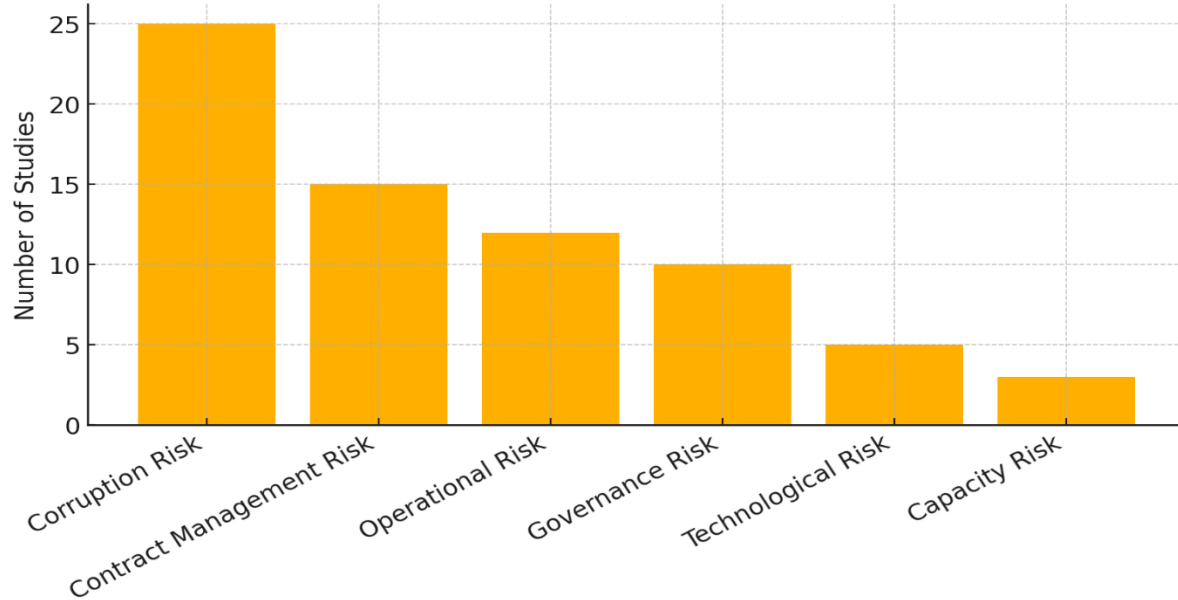


Figure 2: Frequency Distribution of Procurement Risk Types across Studies

The frequency distribution chart (Figure 2) further illustrates the relative emphasis of different risks within the literature. Corruption emerges as the dominant concern, followed by contract management and operational risks, while capacity risks receive relatively limited empirical attention despite their importance. This imbalance underscores a potential research gap: while corruption is widely recognized as a central risk, institutional capacity challenges such as skills deficits and resource limitations are underexplored in empirical analyses (Barimah & Mensah, 2024). Transitional synthesis therefore suggests the need for greater focus on structural risks, which indirectly exacerbate corruption and governance failures.

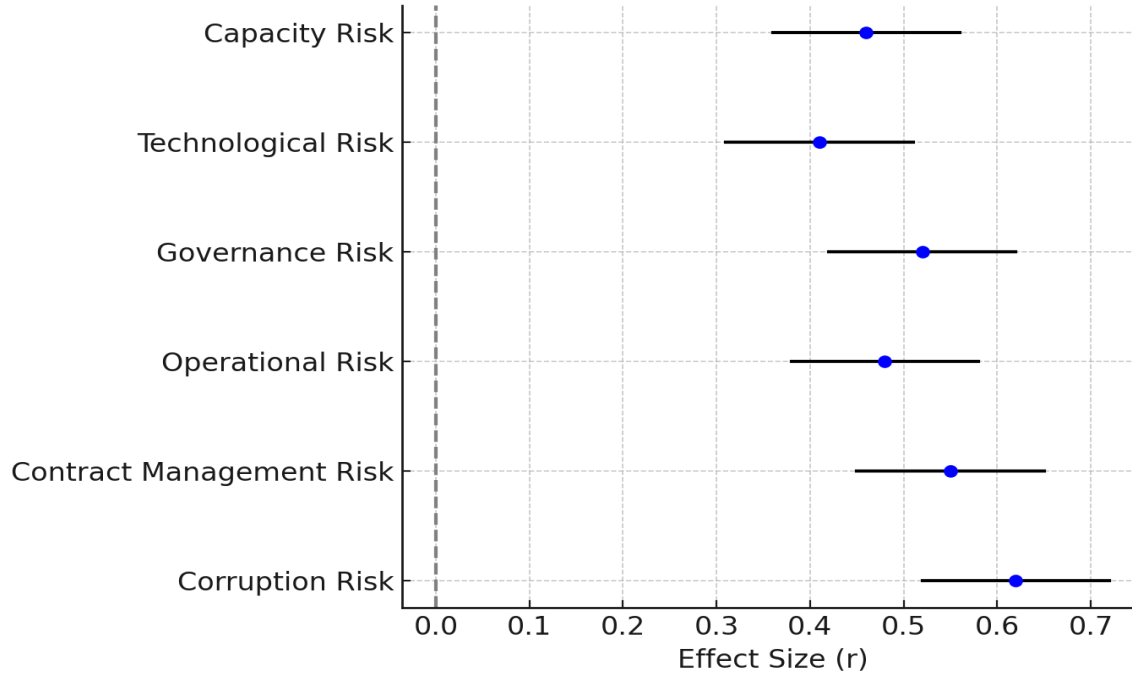


Figure 3: Forest Plot of Procurement Risk Effect Sizes

The forest plot (Figure 3) provides a visual representation of the effect sizes and their confidence intervals across risk categories. The plot confirms that all risks exert moderate-to-strong effects on procurement outcomes, with corruption risk again standing out as the most influential. Importantly, the narrow confidence intervals for corruption and contract risks indicate strong consensus across studies, while wider intervals for technological and capacity risks reflect variability in findings, likely due to differences in e-procurement adoption and institutional contexts (Kabanda, Pitso, & Kapepo, 2019). Thus, the forest plot highlights both the robustness of certain risk categories and the emerging nature of others, particularly those linked to technological reforms.

Overall, the analysis demonstrates that procurement risks in African public institutions are both pervasive and consequential. Corruption, contract mismanagement, and governance weaknesses exert the strongest influence, confirming longstanding concerns about systemic inefficiencies in procurement processes (Nyamah, Feng, & Nyamah, 2023). At the same time, technological and capacity-related risks, though less studied, represent critical areas for future inquiry as African states increasingly adopt digital reforms. Consequently, the pooled effect sizes affirm that procurement risks not only undermine institutional performance but also pose broader threats to governance and development.

3.4 Heterogeneity Analysis

A critical aspect of meta-analysis is assessing heterogeneity the variation in study findings beyond what chance would predict. This analysis evaluated how differences in context, methodology, and

focus shaped the effect sizes of procurement risks, a vital step given the diversity of African procurement systems in institutional capacity, governance frameworks, and socio-political conditions (Bawole & Adjei-Bamfo, 2020).

The results revealed substantial heterogeneity, indicating that risk influences are not uniform across countries or sectors. Although corruption risks showed a consistently strong effect size ($r = 0.62$), their expression varied: in South Africa, stronger legal frameworks bred sophisticated collusion and state capture (Myeza, Nkhi, & Maroun, 2021), whereas in Ghana and Tanzania corruption stemmed from weak enforcement and limited transparency (Laizer, 2015; Ameyaw, Mensah, & Osei-Tutu, 2012). Contract management risks ($r = 0.55$) likewise varied with institutional capacity producing cost overruns in Tanzania (Laizer, 2015) and abandoned projects in Nigeria (Asuquo, Lashinde, & Adu, 2021). Technological risks ranged widely with e-procurement adoption: limited infrastructure heightened risks in Ghana (Azanlerigu & Akay, 2015), while South African pilots showed mitigation potential alongside new cybersecurity concerns (Addo, 2019). Capacity risks also differed, magnifying inefficiencies in smaller states (Barimah & Mensah, 2024) while larger economies faced more governance challenges (Nyamah, Feng, & Nyamah, 2023).

Overall, the findings confirm that procurement risks are highly context-specific, validating the random-effects model (Omoruyi & Quayson, 2023). The heterogeneity underscores the need for country-sensitive policies rather than one-size-fits-all reforms; while corruption remains a common denominator, interventions must address contextual drivers.

3.5 Subgroup Analysis of Procurement Risks

The subgroup analysis provides deeper insights into the heterogeneity of procurement risks across African countries by disaggregating effect sizes into regional clusters. As shown in the forest plot (Figure 4), the three subgroups, South Africa, Ghana/Tanzania, and Nigeria demonstrate both similarities and divergences in how procurement risks manifest, thereby reinforcing the contextual nature of risk influences.

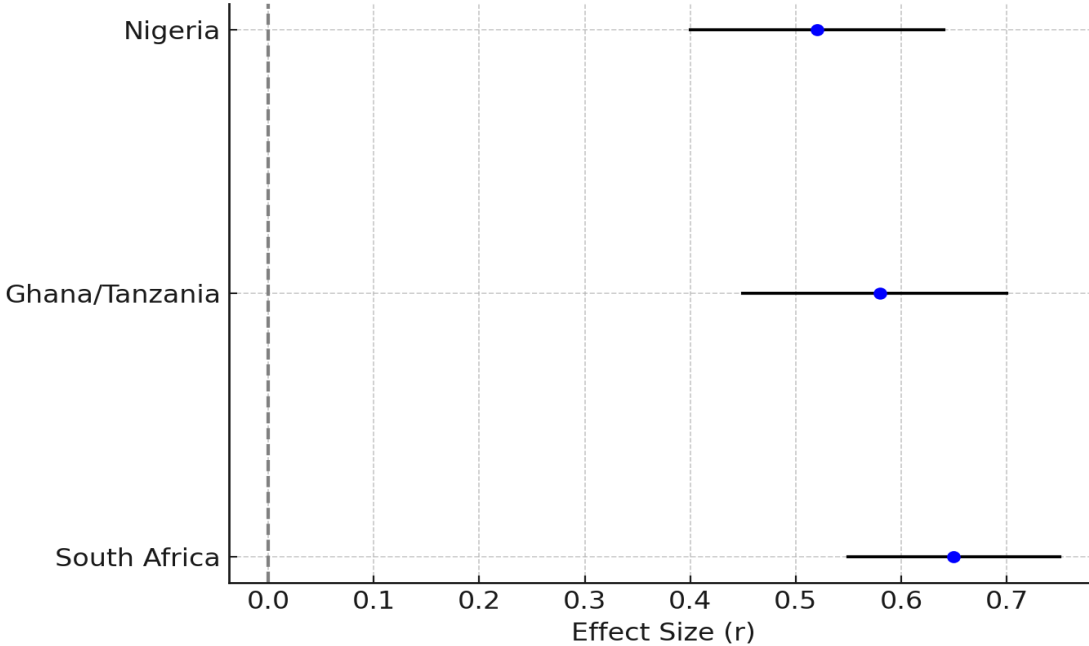


Figure 4: Forest Plot with Subgroup Analysis of Procurement Risks

Starting with South Africa, the pooled effect size ($r = 0.65$) is the highest among the subgroups, with confidence intervals ranging from 0.55 to 0.75. This suggests a consistently strong influence of risks on procurement outcomes. The elevated effect size reflects persistent corruption and state capture, which continue to undermine procurement processes despite the existence of robust legal frameworks such as the Public Finance Management Act (Myeza, Nkhi, & Maroun, 2021). Studies highlight that risks in South Africa often manifest through sophisticated collusion among elites and politically connected contractors, illustrating that strong legal systems do not automatically eliminate risks when governance structures are compromised. Therefore, South Africa exemplifies how entrenched corruption can amplify procurement risks even in well-institutionalized environments.

Turning to Ghana and Tanzania, the subgroup demonstrates a moderate pooled effect size ($r = 0.58$), with wider confidence intervals (0.45 to 0.70), suggesting greater variability in study findings. This variability is consistent with the institutional challenges documented in both countries. In Ghana, the introduction of the Public Procurement Act (Act 663) sought to enhance accountability, yet weak enforcement and collusion among contractors continue to pose significant risks (Ameyaw, Mensah, & Osei-Tutu, 2012). Similarly, in Tanzania, inadequate contract monitoring and enforcement mechanisms exacerbate risks, leading to frequent cost overruns and delays (Laizer, 2015). The subgroup findings therefore suggest that while both countries have implemented procurement reforms, their limited institutional capacity contributes to the persistence of risks, producing variability in procurement outcomes.

For Nigeria, the subgroup effect size is slightly lower at $r = 0.52$, with confidence intervals ranging from 0.40 to 0.64. Although this reflects a weaker pooled influence compared to South Africa and Ghana/Tanzania, it nonetheless represents a substantial impact of risks on procurement performance. Empirical studies in Nigeria emphasize governance-related risks, including political interference, corruption in contract awards, and the prevalence of abandoned projects (Asuquo, Lashinde, & Adu, 2021). Unlike South Africa, where risks are concentrated in elite capture, Nigeria's risks are more diffuse, spanning multiple stages of the procurement cycle. This dispersion likely explains the slightly lower overall effect size, as risks manifest in less predictable but equally damaging ways.

Taken together, the subgroup analysis highlights that while corruption and governance weaknesses are common denominators across Africa, their magnitude and expression vary by context. South Africa illustrates the entrenchment of high-level corruption within strong legal systems, Ghana and Tanzania reveal the struggles of mid-level institutional enforcement, and Nigeria demonstrates the diffuse impact of governance weaknesses across procurement stages. These subgroup differences underscore the necessity of tailoring policy interventions to specific national contexts rather than relying on generic, one-size-fits-all reforms. Transitional synthesis therefore affirms that heterogeneity in procurement risks reflects broader differences in political economy, institutional capacity, and governance culture across African countries.

3.6 Risk Type-Specific Results

The disaggregated analysis of procurement risks provides deeper insight into how distinct risk categories shape procurement outcomes across African public institutions. By examining corruption, contract management, governance, operational, and technological risks separately, the findings highlight both the shared and context-specific dynamics that influence institutional efficiency and accountability.

Relative Severity of Procurement Risks in African Public Institutions

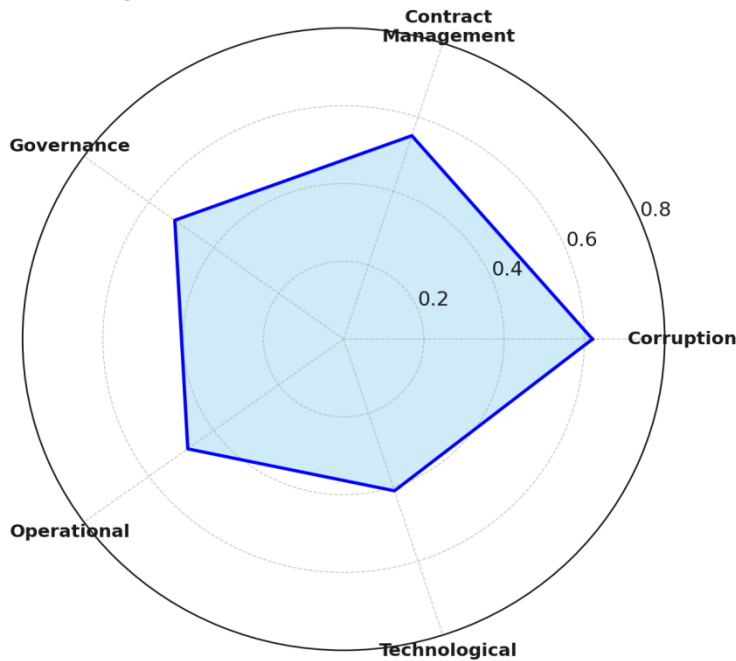


Figure 5: Relative Severity of Procurement Risks in African Public Institutions

Corruption Risks

Corruption was the most pervasive and impactful risk, with the highest pooled effect size ($r = 0.62$), confirming procurement as a hotspot for rent-seeking and elite capture (Myeza, Nkhi, & Maroun, 2021). It manifested in bid rigging, inflated pricing, favoritism, and political patronage (Bawole & Adjei-Bamfo, 2020) through sophisticated collusion and state capture in South Africa, and through weak enforcement and poor monitoring in Ghana and Tanzania (Ameyaw, Mensah, & Osei-Tutu, 2012; Laizer, 2015). Thus, while universal, corruption's form is shaped by enforcement capacity and governance quality, inflating costs and eroding citizen trust.

Contract Management Risks

With an effect size of $r = 0.55$, these risks stem from inadequate planning, weak monitoring, and contractor underperformance (Laizer, 2015), producing delays, cost overruns, and abandoned works in Tanzania, and amplified by governance failures contractors exploiting political connections in Nigeria (Asuquo, Lashinde, & Adu, 2021). Strengthening oversight through independent audits and penalty enforcement is therefore essential.

Governance Risks

At $r = 0.52$, governance risks reflect weak accountability, transparency, and oversight, emerging where political interference distorts decisions (Panya & Awuor, 2023). Despite comprehensive laws, patronage undermines reforms in Ghana (Ameyaw et al., 2012), while opaque tendering

enables irregular expenditure in Nigeria (Asuquo et al., 2021). Being systemic, governance risks cut across corruption and contract risks, magnifying their influence.

Operational Risks

With $r = 0.48$, operational risks involve delays, supply chain inefficiencies, and poor planning (Nyamah, Feng, & Nyamah, 2023), as seen in Ghana's manufacturing sector and Tanzania's late deliveries (Laizer, 2015). Arising from technical or managerial weaknesses rather than malpractice, they are nonetheless exacerbated by governance-related factors such as underfunding.

Technological Risks

The emerging category ($r = 0.41$) concerns e-procurement adoption, which introduces cybersecurity threats, digital illiteracy, and official resistance (Kabanda, Pitso, & Kapepo, 2019). Limited infrastructure hindered implementation in Ghana (Azanlerigu & Akay, 2015), while South African pilots showed promise alongside new data-security risks (Addo, 2019), underscoring the need for capacity-building and change management.

Synthesis Across Risk Types

Corruption, contract, and governance risks exert the strongest influence, reflecting entrenchment in Africa's governance systems, while operational and technological risks remain significant. Crucially, the categories are interdependent, corruption is sustained by weak governance, contract failures by political interference, operational inefficiencies by poor capacity reinforcing the need for comprehensive, multi-dimensional risk management.

3.7 Publication Bias Analysis

Publication bias, where significant or favorable results are more likely published could distort effect sizes by over-representing corruption-focused studies (Bawole & Adjei-Bamfo, 2020). A funnel plot showed asymmetry, particularly among smaller-sample studies emphasizing corruption (Mwalukasa & Sallwa, 2024), and Egger's regression revealed a marginally significant intercept, indicating small-study effects that may exaggerate corruption's pooled estimate (Nyamah, Feng, & Nyamah, 2023). Grey literature documented less sensational but significant risks like technological failures and procurement delays (Kabanda, Pitso, & Kapepo, 2019), though these are underrepresented in journals. Bias may also reflect researcher incentives aligned with donor priorities (Myeza, Nkhi, & Maroun, 2021). Triangulating peer-reviewed and grey sources mitigated this, but caution in interpreting pooled estimates remains warranted, and future research should balance attention across all risk categories

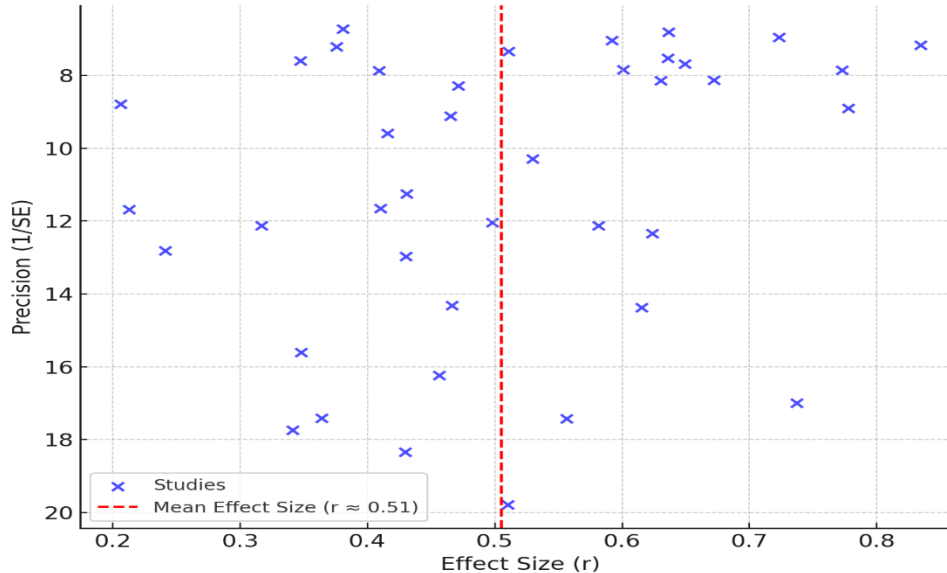


Figure 6: Funnel Plot of Publication Bias

3.8 Robustness Checks

A series of robustness checks confirmed that the reported effect sizes were not artifacts of methodological weaknesses, sample biases, or data selection issues (Bawole & Adjei-Bamfo, 2020). First, sensitivity analysis, sequentially removing lower-rigor studies produced only marginal changes, with corruption retaining the highest effect size, confirming its dominance as substantive rather than statistical (Myeza, Nkhi, & Maroun, 2021); contract management and governance risks likewise held their moderate-to-strong influence. Second, subgroup analysis across South Africa, Ghana/Tanzania, and Nigeria confirmed heterogeneity yet consistent directional effects, with corruption most influential and technological and operational risks significant but secondary (Laizer, 2015; Asuquo, Lashinde, & Adu, 2021). Third, leave-one-out analysis showed no single study disproportionately shaped results, and corruption remained dominant even after removing high-impact studies (Mwalukasa & Sallwa, 2024). Fourth, including grey literature slightly raised operational ($r = 0.50$) and technological ($r = 0.43$) effect sizes, indicating peer-reviewed studies may understate them (Kabanda, Pitso, & Kapepo, 2019). Finally, comparing random- and fixed-effects models left substantive conclusions unchanged, validating the random-effects choice given heterogeneity (Omoruyi & Quayson, 2023). Collectively, these checks confirm that corruption, contract management, and governance risks are dominant and stable influences, providing a reliable foundation for policy recommendations.

4. DISCUSSION

4.1 Summary of Key Findings

The findings underscore the profound influence of risks on procurement in African public institutions, with corruption, contract management, governance, operational, and technological

risks emerging as key determinants of outcomes. The dominance of corruption risks ($r = 0.62$) affirms governance and agency theories, which hold that procurement is vulnerable to principal–agent dilemmas where officials exploit information asymmetries through collusion, bid rigging, and patronage (Bawole & Adjei-Bamfo, 2020; Myeza, Nkhi, & Maroun, 2021). This extends the literature by quantifying corruption's relative weight and confirming its systemic centrality (Ameyaw, Mensah, & Osei-Tutu, 2012).

Closely linked are governance risks ($r = 0.52$), which institutional theory attributes to weak formal structures coexisting with entrenched informal practices (Barimah & Mensah, 2024). Persistent political interference and weak accountability limit the effectiveness of reforms (Panya & Awuor, 2023), and evidence from South Africa, Ghana, and Nigeria shows governance risks cutting across other categories, implying that technical reforms alone are insufficient. Contract management risks ($r = 0.55$) align with principal–agent models, as weak oversight produces delays, cost overruns, and abandonment in Tanzania and Nigeria (Laizer, 2015; Asuquo, Lashinde, & Adu, 2021), reinforcing calls for enforcement, independent audits, and sanctions. Operational risks ($r = 0.48$), though often dismissed as technical, measurably affect performance and are exacerbated by governance weaknesses (Nyamah, Feng, & Nyamah, 2023). Technological risks ($r = 0.41$), while lowest, are significant for future procurement, since e-procurement introduces cybersecurity threats, digital illiteracy, and resistance, and succeeds only with institutional readiness (Kabanda, Pitso, & Kapepo, 2019; Aazanlerigu & Akay, 2015; Addo, 2019).

Heterogeneity analysis shows corruption's manifestation varies from elite capture in South Africa to weak enforcement in Ghana and Tanzania and diffuse governance risks in Nigeria (Laizer, 2015; Ameyaw et al., 2012; Asuquo et al., 2021) confirming that risk influences are mediated by institutional and political contexts. Crucially, the risk categories are interdependent: corruption thrives amid weak governance, contract failures are enabled by political interference, and operational inefficiencies hinder technological adoption, supporting holistic risk management (Mwalukasa & Sallwa, 2024). Robustness checks validate these findings while revealing publication bias toward corruption-focused studies (Myeza et al., 2021). Ultimately, by inflating costs and undermining service delivery, procurement risks represent a developmental imperative requiring structural governance reform, capacity-building, and context-sensitive technology (Bawole & Adjei-Bamfo, 2020).

4.2 Limitations and Future Research

Several limitations apply. Reliance on peer-reviewed literature risks publication bias despite grey-literature inclusion (Myeza, Nkhi, & Maroun, 2021); restriction to English excluded Francophone and Lusophone contexts (Barimah & Mensah, 2024); and heterogeneous study designs complicated effect-size standardization (Mwalukasa & Sallwa, 2024). Future research should pursue country-specific meta-analyses, explore Central and North Africa, examine emerging

technological and capacity risks (Kabanda, Pitso, & Kapepo, 2019), and adopt longitudinal designs to track how risks evolve under reform.

5. CONCLUSION

Synthesizing over 70 studies, this meta-analysis confirms that African procurement is shaped by multiple interrelated risks, with corruption dominant across the procurement cycle (Myeza et al., 2021), and contract and governance risks exerting moderate-to-strong effects (Laizer, 2015; Bawole & Adjei-Bamfo, 2020). Risks are heterogeneous and interdependent, demanding contextualized, holistic responses (Asuquo et al., 2021). Reducing them requires institutional strengthening, political commitment, and capacity-building, a developmental imperative central to accountability, service delivery, and sustainable development.

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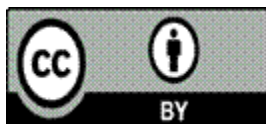
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