Investigating Challenges of Public Procurement Auditing Processes in the Nigerian Institute of Mining and Geosciences, Jos

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Abstract
Effective auditing of public procurement is central to accountability and value for money in the public sector, yet little is known about how auditing functions within specialised, technically oriented public research institutions. This study examines the challenges, influencing factors and regulatory compliance of public procurement auditing at the Nigerian Institute of Mining and Geosciences (NIMG), Jos. A mixed-methods, single-institution case study was conducted using a census of 22 procurement, legal, audit and finance personnel at NIMG. Data were collected through a structured, five-point Likert-scale questionnaire (pilot-tested for reliability, Cronbach's alpha ≥ 0.70) and complemented by semi-structured interviews and document review. Quantitative data were analysed descriptively (means, standard deviations, frequencies); qualitative data were analysed thematically. Insufficient staffing and inadequate technical training of auditors (mean = 3.82) emerged as the most pressing operational challenge, followed by inadequate funding (mean = 3.68) and poor documentation practices (mean = 3.59). Internal policy frameworks (mean = 4.18) and auditor expertise in geotechnical procurement (mean = 3.91) were the strongest perceived influences on procurement decision-making, while political interference (mean = 3.77) was the factor most frequently associated with reduced audit effectiveness. Respondents perceived NIMG's audit function as broadly, though unevenly, compliant with the Public Procurement Act 2007 (grand mean = 3.83), with timeliness of audit reporting the weakest dimension. The findings support targeted investment in technical auditor training, phased adoption of e-procurement/digital audit trails, stronger documentation systems, and institutional safeguards against political interference. This is among the first studies to examine procurement auditing empirically within a specialised Nigerian mining and geosciences institute, extending agency, institutional and resource-based theorising to a technical public-sector context and offering a transferable diagnostic template for comparable science and technology parastatals.

Keywords: *public procurement auditing; audit effectiveness; regulatory compliance; Public Procurement Act 2007; specialised public institutions; Nigeria*

1. Introduction

Public procurement typically accounts for a substantial share of government expenditure and is a principal channel through which states deliver infrastructure and services (Afieroho et al., 2023). In Nigeria, however, procurement is widely associated with inefficiency, weak accountability and corruption (Dávid-Barrett and Fazekas, 2020), and procurement auditing; the systematic examination of procurement activity against policy, legal and value-for-money criteria is repeatedly identified as an underused safeguard against these problems (Jiménez, Hanoteau and Barkemeyer, 2022). Much of the empirical literature on procurement auditing in Nigeria and comparable developing-country settings addresses general public-sector agencies or large infrastructure ministries (Ferry et al., 2021; Amankwah-Amoah, Debrah and Acquaah, 2023). Considerably less is known about how auditing operates inside specialised, technically oriented public institutions, where procurement routinely involves scientific and engineering specifications (laboratory and mining equipment, geological survey instruments and technical consumables) that generic audit competencies may not adequately cover. The Nigerian Institute of Mining and Geosciences (NIMG), Jos, a World Bank/NUC-supported Federal Government parastatal charged with training and research for Nigeria's extractive sector, offers a useful setting in which to examine this gap. This study therefore investigates the challenges confronting procurement auditing at NIMG, the factors that shape procurement processes and audit effectiveness there, and the extent to which auditing practice aligns with the Public Procurement Act (PPA) 2007 and Bureau of Public Procurement (BPP) guidelines. Specifically, the study: (i) identifies the primary operational challenges to procurement auditing at NIMG; (ii) examines the factors influencing procurement processes; (iii) analyses how these factors affect audit effectiveness; (iv) evaluates NIMG's compliance with the PPA 2007; and (v) proposes practical strategies for strengthening auditing at NIMG and comparable institutions. By grounding these questions in a single, information-rich technical institution and triangulating survey, interview and document data, the study contributes agency-, institutional- and resource-based theoretical insight, together with practically actionable findings, to the still-thin literature on procurement auditing in specialised African public institutions.

2. Literature Review and Theoretical Framework

2.1 Procurement Auditing: Concept and Relevance

Procurement auditing is the systematic review of an organisation's procurement activity to verify compliance with applicable policies, laws and regulations, and to identify opportunities to strengthen internal control (Jeppesen, 2019). Where it functions well, it is associated with cost savings, stronger internal controls, greater stakeholder trust and improved organisational credibility (Jiménez, Hanoteau and Barkemeyer, 2022); where it is weak, procurement systems tend toward supplier favouritism, cost and schedule overruns, and diminished public trust (Ferry et al., 2021).

2.2 Theoretical Framework

Three complementary theories underpin the study. Agency theory (Jensen and Meckling, 1976) frames procurement officials as agents who may not always act in the interests of the state (the principal), making independent auditing a key monitoring mechanism for aligning agent behaviour with public interest. Institutional theory (DiMaggio and Powell, 1983) explains why organisations converge on similar auditing structures under coercive (regulatory), normative (professional) and mimetic pressures – helping to account for both NIMG's adoption of formal audit procedures and the persistence of gaps between formal policy and everyday practice. The resource-based view (Barney, 1991) treats procurement auditing itself as an organisational capability: where auditors possess the specialised technical knowledge that mining- and geoscience-related procurement demands, auditing becomes a source of operational resilience and, potentially, of competitive or reputational advantage for the institute.

2.3 Empirical Review and Research Gap

Nigerian evidence on procurement auditing tends to concentrate on national-level or cross-sectoral analysis. Osuoka (2020) documents how the Nigeria Extractive Industries Transparency Initiative has advanced accountability in the wider extractive sector, while Ferry et al. (2021) show how weak and inconsistently applied regulatory frameworks blunt the effectiveness of accounting and audit compliance mechanisms in Nigerian public institutions more broadly. Comparative work outside Nigeria similarly links institutional quality to audit performance: Lisciandra, Milani and Millemaci (2022) develop a corruption-risk indicator for European public procurement, and Sarawa and Mas'ud (2020) show that ethical behaviour mediates the relationship between regulatory frameworks and compliance. Studies of auditing's organisational payoff; including its role in curbing corruption (Jeppesen, 2019) and in enabling data-driven transparency (Felizzola et al., 2024), further support the proposition that stronger auditing improves procurement and organisational outcomes.

What remains largely absent from this literature is close empirical attention to specialised, technically oriented public institutions, where procurement auditing must contend with domain-specific specifications that generalist frameworks do not anticipate. This study addresses that gap by examining NIMG, Jos, providing what is, to the authors' knowledge, among the first empirical accounts of procurement auditing practice within a Nigerian mining and geosciences training and research institute.

3. Methodology

The study adopted a mixed-methods, single-institution case study design, combining a structured questionnaire survey with semi-structured interviews and a review of procurement and audit documentation, to allow triangulation between stakeholders' self-reported perceptions and documented practice. The study population comprised all 22 personnel directly involved in procurement, legal, audit and finance functions at NIMG (5 procurement officers, 3 legal officers, 3 audit officers and 11 finance/management staff). Given the small and well-defined size of this population, a complete-enumeration (census) approach was used rather than probability sampling, so that the findings reflect the full range of relevant institutional perspectives available at the time of the study. The primary instrument was a structured questionnaire using five-point Likert-type items (1 = strongly disagree/not a challenge to 5 = strongly agree/very significant challenge) covering current auditing practice, factors influencing procurement, factors affecting audit effectiveness, and compliance with the PPA 2007. The instrument was piloted, revised for clarity, and assessed for internal consistency using Cronbach's alpha, with a threshold of 0.70 applied as the minimum acceptable level of reliability; content validity was established through expert review, and construct validity was examined through exploratory factor analysis. Interviews with a purposive subset of respondents and a review of audit reports, procurement records and policy documents supplemented the survey and supported thematic analysis of qualitative responses.

Quantitative data were analysed using descriptive statistics (frequencies, percentages, means and standard deviations) computed for each Likert item, consistent with the sample size and case-study design. Consistent with best practice for small, non-probability samples, no inferential (correlational or regression-based) hypothesis testing was performed; the three guiding propositions set out at the design stage of the study are accordingly treated here as interpretive lenses for the descriptive findings rather than as statistically tested hypotheses (see Section 6.3 for further discussion of this limitation). Interview transcripts were coded thematically to identify recurring patterns that contextualised the quantitative results. Ethical approval, informed consent, and assurances of confidentiality and voluntary participation were observed throughout.

4. Results

4.1 Respondent Profile

Of the 22 respondents, 63.6% were male and 36.4% female. The largest age bands were 26–35 years (36.4%) and 36–45 years (27.3%), indicating a relatively young to mid-career workforce. Most respondents were married (54.5%) and held a Bachelor's (45.5%) or Master's (36.4%) degree. By function, Finance/management staff formed the largest group (50.0%), followed by Procurement (22.7%), and Legal and Audit officers (13.6% each). Just over half of respondents (54.5%) had six or more years of relevant experience, suggesting the sample was well positioned to speak to established institutional practice.

4.2 Challenges in Procurement Auditing Processes

Table 1 reports respondents' agreement with statements describing operational challenges to procurement auditing at NIMG.

Statement	SD (1)	D (2)	N (3)	A (4)	SA (5)	Mean	Std. Dev.
Insufficient staffing and training hinder timely completion of audits	1	2	5	8	6	**3.82**	1.06
Inadequate funding limits the scope and depth of audit activities	1	3	4	9	5	**3.68**	1.09
Technical specifications for mining/geosciences equipment complicate audit verification	2	3	4	7	6	**3.59**	1.24
Poor record keeping and documentation delays audit verification	3	2	5	8	4	**3.50**	1.19
Regional security issues in Jos restrict access to procurement sites during audits	2	4	5	6	5	**3.50**	1.22

Table 1: Challenges in Procurement Auditing Processes at NIMG (N = 22).

Staffing and training gaps were the most strongly endorsed challenge (mean = 3.82), followed by inadequate funding (mean = 3.68). Technical-specification complexity, poor documentation and the security environment in Jos each carried a mean above the 3.0 neutral midpoint, indicating that all five challenges were, on balance, recognised by respondents as material constraints on audit performance.

4.3 Factors Influencing Procurement Processes

Table 2 presents respondents' views on the factors shaping day-to-day procurement decision-making at NIMG.

Statement	SD (1)	D (2)	N (3)	A (4)	SA (5)	Mean	Std. Dev.
Staff expertise in geotechnical procurement affects selection efficiency	0	1	2	11	8	**3.91**	1.00
Internal policies and guidelines strongly shape procurement decision-making	1	1	3	10	7	**4.18**	0.83

Statement	SD (1)	D (2)	N (3)	A (4)	SA (5)	Mean	Std. Dev.
Relationships with suppliers influence procurement speed and quality	1	2	3	9	7	**3.86**	1.07
Federal budget approvals significantly delay procurement timelines	1	2	4	9	6	**3.77**	1.06
Limited adoption of digital procurement tools impacts process transparency	2	2	4	9	5	**3.59**	1.16

Table 2: Factors Influencing Procurement Processes at NIMG (N = 22).

Internal policy frameworks were rated the strongest influence on procurement decisions (mean = 4.18), followed by staff technical expertise (mean = 3.91) and supplier relationships (mean = 3.86). Budgetary delay and limited digitisation were also endorsed, though somewhat less strongly, suggesting that internal governance and human-capital factors were perceived as more consequential than external or technological constraints at this stage of the procurement cycle.

4.4 Factors Affecting Auditing Effectiveness

Table 3 reports the perceived severity of factors specifically undermining audit effectiveness.

Statement	SD (1)	D (2)	N (3)	A (4)	SA (5)	Mean	Std. Dev.
Political interference frequently alters procurement audit findings	1	2	4	9	6	**3.77**	1.05
Corruption risks lead to frequent deviations from standard procedures	1	3	5	7	6	**3.68**	1.13
Lack of transparency practices undermines stakeholder trust in audits	2	3	4	8	5	**3.59**	1.18
Auditor capacity gaps reduce the reliability of oversight reports	2	3	5	8	4	**3.50**	1.14
Funding delays create cascading inefficiencies in audit execution	3	4	6	6	3	**3.14**	1.18

Table 3: Factors Affecting Auditing Effectiveness at NIMG (N = 22).

Political interference was the most strongly endorsed threat to audit effectiveness (mean = 3.77), closely followed by corruption risk (mean = 3.68). Auditor capacity gaps and funding delays, while still above the neutral midpoint, were rated comparatively less severe, indicating that governance- and integrity-related pressures were perceived as more damaging to audit reliability than resource constraints alone.

4.5 Compliance with the Public Procurement Act 2007

Table 4 summarises perceived compliance with the PPA 2007 and BPP guidelines.

Statement	SD (1)	D (2)	N (3)	A (4)	SA (5)	Mean	Std. Dev.
Procurement audits fully align with Bureau of Public Procurement guidelines	0	2	3	10	7	**4.00**	0.95
Non-compliance issues have resulted in formal sanctions or penalties	1	2	3	9	7	**3.82**	1.07
Competitive bidding processes consistently meet regulatory standards during audits	1	1	3	11	6	**3.91**	0.99
Documentation practices satisfy all legal requirements under the Act	1	1	3	10	7	**3.91**	1.00
Audit reports are submitted and reviewed within required timelines	2	3	5	7	5	**3.50**	1.19

Table 4: NIMG's Compliance with the Public Procurement Act 2007 (N = 22).

Perceived alignment with BPP guidelines was highest overall (mean = 4.00), and documentation and competitive-bidding practices were also rated favourably (mean = 3.91 each). Timeliness of audit reporting was the weakest dimension (mean = 3.50), pointing to a specific, addressable bottleneck in the audit cycle rather than a wholesale compliance failure. The grand mean across all four constructs (challenges = 3.62; influencing factors = 3.86; effectiveness threats = 3.54; compliance = 3.83) indicates that respondents recognised both meaningful institutional strengths and specific, remediable weaknesses in NIMG's procurement auditing system.

5. Discussion

The findings position NIMG's procurement auditing function as institutionally present but unevenly effective; a pattern consistent with institutional theory's account of formal structures adopted under coercive and normative pressure (statutory mandate, professional audit norms) that are not yet fully embedded in day-to-day practice (DiMaggio and Powell, 1983). The prominence of staffing and technical-training gaps (Table 1) and the strong endorsement of staff expertise as a driver of procurement quality (Table 2) together support a resource-based reading (Barney, 1991): where NIMG's auditors possess domain-specific mining and geoscience knowledge, procurement auditing functions as a genuine organisational capability, but the current shortfall in that capability constrains the audit function's overall value.

The salience of political interference and corruption risk as threats to audit effectiveness (Table 3) is consistent with agency-theoretic expectations that, absent robust monitoring, agents (procurement and audit officials) remain exposed to principal–agent conflicts and external pressure that can distort audit findings (Jensen and Meckling, 1976). This mirrors evidence from wider Nigerian and Sub-Saharan African procurement research showing that formal anti-corruption and compliance architecture often coexists with weak enforcement (Dávid-Barrett and Fazekas, 2020; Ferry et al., 2021; Amankwah-Amoah, Debrah and Acquaah, 2023).

The compliance results (Table 4) suggest that NIMG's shortfall relative to the PPA 2007 is concentrated less in substantive practice; competitive bidding and documentation were both rated favourably, and more in process timeliness, echoing findings elsewhere that procurement delay, rather than outright non-compliance, is often the binding constraint on effective audit oversight (He, Milne and Ataullah, 2023). Taken together, the results suggest that targeted, capability-building interventions (technical auditor training, digital audit trails, stronger documentation systems) are likely to yield more traction than broad compliance mandates alone, a conclusion consistent with evidence that digital, data-driven approaches materially improve procurement transparency (Felizzola et al., 2024; Siciliani et al., 2023).

6. Conclusion, Implications and Limitations

6.1 Conclusion

Procurement auditing at NIMG, Jos operates within a formally recognised regulatory structure but is constrained by a combination of capacity deficits (insufficient staffing and specialised technical training) and external pressures, notably political interference and funding volatility. Compliance with the PPA 2007 is strongest in substantive procurement practice (competitive bidding, documentation) and weakest in the timeliness of audit reporting. Without deliberate reforms addressing auditor capacity, documentation systems and institutional insulation from political pressure, the audit function is likely to remain a largely reactive control mechanism rather than a proactive driver of procurement performance.

6.2 Practical and Policy Implications

For NIMG management, the findings support (i) specialised, mining/geoscience-focused training for auditors and procurement officers, paired with regular refreshers on the PPA 2007; (ii) phased adoption of e-procurement platforms to create immutable, real-time audit trails; (iii) centralised, digitised record-keeping to reduce documentation-related audit delays; (iv) an internal oversight or ethics mechanism to buffer procurement decisions from external political pressure; and (v) explicit service standards for the review and closure of audit reports. For the Bureau of Public Procurement and other oversight bodies, the findings suggest that generic compliance frameworks may need to be supplemented with sector-specific technical guidance for specialised science and technology institutions.

6.3 Limitations and Directions for Future Research

Three limitations qualify these findings. First, the census sample (N = 22) is appropriate to NIMG's population of relevant staff but is small in absolute terms and confined to a single institution, which limits statistical power and generalisability; the results should be read as an in-depth institutional diagnostic rather than a population-representative estimate. Second, consistent with this sample size, the analysis is descriptive; the correlational and regression-based hypothesis testing outlined at the design stage was not performed, and the study's three guiding propositions were therefore examined interpretively against the descriptive results rather than through formal significance testing. Third, self-reported Likert data are subject to social-desirability and common-method bias, only partly mitigated here by triangulation with interviews and document review. Future research should extend this design across multiple specialised Nigerian public research institutions, employ probability sampling with larger combined samples to permit inferential (correlation/regression or structural equation) testing of the relationships proposed here, and track outcomes following the adoption of e-procurement and training interventions to assess their causal effect on audit effectiveness.

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