

EVALUATING THE EFFECTIVENESS OF FORENSIC ACCOUNTING AUDITS IN PREVENTING SUPPLIER COLLUSION IN ZIMBABWE'S PUBLIC PROCUREMENT SYSTEM

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ABSTRACT

The public procurement system plays a crucial role in the country's resource allocation system. It is also crucial for service delivery and governance. Despite all this this system seems to be most vulnerable to fraud and supplier collusion. The regulatory authority (PRAZ) has enacted the 2017 Public Procurement and Disposal of Public Assets Act. Despite this collusion has persisted. This has been aligned to weak oversight and limited enforcement of audit recommendations. Traditional audits have failed to detect the complex collusive practices like bid rigging and price-fixing. The use of investigative accounting (forensic accounting) becomes a suitable solution. Its techniques can unearth irregular financial patterns. They also detect hidden relationships, offering a strategic safeguard against procurement fraud. This paper made use of the Institutional Theory and fraud-related frameworks. The study employed the quantitative methodology. This called for a cross-sectional survey. Thus, a population of 112 respondents was obtained. The members came from the Zimbabwe's ministries, local authorities, and parastatals. Some respondents also came from forensic accountants, the procurement authority and the anti-corruption authority. SPSS was used to analyse data through SEM, regression analysis and AMOS. The findings reflected that a most of the respondents agreed on the effectiveness of forensic accounting audits. The regression results revealed a +`strong positive association with procurement effectiveness ($\beta = 0.369$, $p < 0.01$). The study recommended institutionalising forensic audit practices, capacity-building, and stricter enforcement to enhance procurement integrity and accountability

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INTRODUCTION

The public procurement system must ensure efficient, transparent and accountable acquisition of goods and services by governments. Thus, the system ought to enable open and fair suppliers' competition. This enables value for money with enhanced public trust in state owned enterprises, ministries and departments. However, procurement processes are often



susceptible to collusion, corruption, and fraud (OECD, 2016). Such scenario distort competition and undermine development objectives

Ideally suppliers are expected to compete fairly in the public procurement system. The system must be in the confines of the principles of transparency, accountability, and value for money. There must be no collusion in the system. More so the system should enable efficient allocation of resources at the same time promoting public trust within state organisations. The forensic audits ought to manage to detect irregularities and enhance compliance. This tool must manage to discourage anti- competitive features such as bid rigging and supplier collusion. Such a situation would enable fair practice on access to tenders and competitive pricing. Thus, integrity especially on service delivery prevails through forensic audits.

Zimbabwe has quite a unique situation when it comes to the public procurement system. As pointed out by the "Public Procurement and Disposal of Public Assets Act [Chapter 22:23], No. S/2017 (2017)", collusion among suppliers remains prevalent. Such scenario gets enabled by weak oversight mechanisms, limited enforcement of audit recommendations, and gaps in accountability structures. In the same view the Office of the Auditor-General (2022) has recurrently identified cases of bid manipulation, exaggerated pricing, and procurement malpractices. Such situations point to collusive arrangements between suppliers and sometimes even with procurement officials. These practices compromise value for money, erode public confidence, and divert scarce resources from essential developmental priorities.

According to the OECD (2016) the recurrence of supplier collusion reflects the insufficiency of traditional audits and regulatory frameworks in curbing public procurement fraud. Thus, the traditional auditing mechanisms have proved inadequate in detecting complex forms of fraud such as supplier collusion. The reasons include that these situations often involve sophisticated schemes, hidden relationships, and manipulation of procurement records. This has created growing interest in the application of forensic accounting. Such a system employs investigative techniques, data analytics, and financial forensics to identify irregularities that conventional audits may overlook. Forensic accounting is increasingly recognised as a strategic tool for combating procurement fraud (Bhasin, 2016). It is essential at deterring collusive behaviours, and reinforcing accountability in public sector institutions

The application of forensic accounting within Zimbabwe's procurement environment remains limited and underexplored (Zhou, 2023). This is happening despite that these audits offer advanced investigative techniques. Such techniques can trace irregular financial patterns, uncover hidden relationships, and deter collusive behaviour. This is a reflection that we need

to examine how forensic accounting might help to mitigate collusion in the public procurement system in Zimbabwe. The purpose of this paper was to assess the effectiveness of forensic accounting on preventing collusion amongst suppliers in the public procurement system. This was investigated through a suitable hypothesis as follows. Forensic accounting has a significant negative effect on supplier collusion on the public procurement system effectiveness. This entails that forensic accounting significantly reduces public procurement system supplier collusion.

Generally, forensic accounting has been used to identify procurement system collusion and corruption and fraud in Nigeria, India, and South Africa. Collusion and corruption were observed to be prevalent in public contracting of these countries (Transparency International, 2024). Use of forensic accounting in Zimbabwe has remained limited, and their role in curbing supplier collusion has not been extensively studied. Since there are recurring scandals, there is need to try forensic accounting. This might restore sanity in the public procurement system in Zimbabwe.

Theoretically, this study examines the Institutional Theory and fraud schemes showing that forensic accounting works as a safeguard against supplier collusion (Munyepwa et al., 2025). Practically, it informs policymakers and regulators, such as PRAZ and the Auditor-General, on the importance of institutionalising forensic accounting. For public institutions, these audits not only detect collusion but also deter it, enhancing transparency and public trust in procurement processes (Munyepwa et al., 2025). The study reiterated the need for ensuring that forensic auditors are capacity-built. Particularly forensic auditors must adopt modern technologies such as data analytics and digital audit tools. This was done to enhance skills and technological innovation of the forensic accountants (Thakkar & Chikoko, 2025). This would align Zimbabwe's procurement practices with international standards

The study's findings are shall not only be relevant to Zimbabwe. They shall offer insights for other developing countries struggling with procurement fraud and supplier collusion. It shall contribute to the global discourse on enhancing accountability and integrity in public procurement systems (Munyepwa et al., 2025).

LITERATURE REVIEW

Public procurement is a cornerstone of effective governance. It ensures that public resources are used efficiently to provide essential goods and services to citizens. Procurement

systems should ensure transparency, accountability, and fair competition among suppliers. This means it must ensure value for money and enhanced public trust. On the contrary, public procurement is highly susceptible to fraud, collusion, and corruption (Organisation for Economic Co-operation and Development (OECD), 2016). These aspects weaken competition and service delivery. This happens regardless the presence of legal frameworks such as the “Public Procurement and Disposal of Public Assets Act (2017)” and oversight mechanisms like the Office of the Auditor-General. Thus, the legal frameworks persistently fail to effectively address aspects such as superseded procurement systems, bottlenecks, and “inflationary pressures” on budgets (Chikodzi & Nyakudya, 2023)

Collusion among suppliers signifies one of the most sinister forms of procurement fraud. It involves coordinated behaviours like bid-rigging, price-fixing, and submission of artificially inflated or dummy bids. Such aspects distort competition and inflate procurement costs. Conventional auditing methods struggle to detect these sophisticated schemes since they basically focus on financial compliance rather than investigating complex, concealed transactions (Applied Network Science, 2022). The persistence of collusion highlights the limitations of traditional audits and underscores the need for specialized investigative tools such as forensic accounting.

Forensic accounting audits are now a critical mechanism for detecting, preventing, and deterring procurement fraud. These audits extend beyond routine checks. They use advanced investigative techniques. Examples include data analytics, transaction tracing, and relationship mapping. Such allow auditors to uncover hidden patterns and collusive networks.

In Brazil, forensic accounting was highly contributory in “Operation Car Wash (Lava Jato)”. Globally, this scenario proved to be one of the most serious corruption and procurement fraud investigations. In one the state-owned oil companies (Petrobras), forensic accountants uncovered widespread bid rigging and collusion (Ferraz, Finan, & Moreira, 2016). Investigations revealed that construction companies had established cartels. These cartels were meant to exaggerate procurement contracts. Bribes were being paid to politicians and executives in exchange for biased and sympathetic treatment. Forensic accounting experts were engaged. They carried out forensic analysis of procurement records. Hence, forensic analysis revealed essential evidence which led to multiple convictions and procurement reforms in Brazil (Ferraz, Finan, & Moreira, 2016).

Empirical studies in Nigeria revealed that forensic accounting meaningfully decreases procurement fraud. For instance, research conducted in Osun State revealed a robust negative

relationship between the use of forensic auditing techniques and incidences of procurement fraud (Majaf, 2024). This emphasized the importance of skilled forensic accountants and robust investigative systems. Similarly, in Rivers State, studies confirmed that forensic accounting competencies, investigative techniques, and proactive audits were strongly associated with reduced incidences of payroll and procurement fraud (Zinyama & Hamadziripi, 2023). These findings exposed that forensic accounting was not only effective at detecting irregularities. It was also relevant at preventing fraudulent conduct when consistently applied.

In Africa, there are significant contextual challenges upon utilising forensic accounting. Despite that use of forensic accounting has been shown to be of great potential of enhancing procurement integrity. In South Africa, forensic accounting has been instrumental in exposing state capture and irregular tender allocations (Transparency International, 2024). This was crucial at showing the link between advanced auditing practices and accountability. Hence forensic accounting was effective when combined with institutional support, adequate data access, and legal enforcement mechanisms.

In Zimbabwe, Murinda and Chiwariro (2023) revealed that forensic accounting improves detection of fraudulent activities in government expenditure cycles. However, research to reveal its role in mitigating supplier collusion remains limited. Other studies, such as Zinyama and Hamadziripi (2023), highlighted the prevalence of non-competitive procurement practices, including direct procurement and manipulated tender processes. Emphasis was that they did not empirically assess the contribution of forensic accounting audits in curbing collusion. Takudzwa (2024) noted that risk management strategies such as supplier pre-qualification and contract due diligence mitigate general procurement risks. However, they were insufficient to detect sophisticated collusive schemes, pointing to a critical gap that forensic auditing can address.

Despite its potential, the application of forensic accounting audits in Zimbabwe remains constrained by several factors. These include limited capacity, lack of trained personnel, fragmented data, and weak enforcement of audit findings. Consequently, opportunities for supplier collusion persist, undermining the effectiveness of legal and regulatory frameworks. The reviewed literature collectively indicates that forensic accounting has a proven track record in detecting and preventing procurement fraud. Empirical studies examining its specific impact on supplier collusion in Zimbabwe are scarce. This gap highlights the need for focused research that evaluates how forensic accounting audits can serve as a strategic tool to prevent collusion and enhance transparency and accountability in Zimbabwe's public procurement system.

In summary, the literature consistently underscores that collusion is a major threat to procurement integrity. Conventional audits are often insufficient, and forensic accounting audits offer an advanced, effective approach for detection and deterrence. However, contextual factors such as institutional capacity, data availability, and enforcement mechanisms are critical for realising the full potential of forensic auditing. Through this paper gaps shall be filled by investigating the role of forensic accounting audits in mitigating supplier collusion in Zimbabwe's public procurement systems. It shall contribute to improved governance, accountability, and value for money in public service delivery.

METHOD

This study adopted a quantitative research methodology. The purpose of this study was examining the impact of forensic accounting audits on mitigating collusion among suppliers in Zimbabwe's public procurement system. The method was preferred because it allowed for numerical measurement of variables, assessment of relationships between independent and dependent variables, and statistical hypothesis testing. A cross-sectional survey approach was used to gather data at a single point in time. This method provided insights into the current state of forensic accounting practices in public procurement institutions. It also helped to assess the prevalence of supplier collusion within these institutions.

The study had a population which comprised procurement officers, accountants, internal auditors, and officials from the procurement regulatory authority and across government ministries, parastatals, and local authorities in Zimbabwe. These stakeholders were targeted because of their direct involvement in procurement processes, audit activities, and financial oversight. This made them well-positioned to provide reliable data on the application of forensic accounting audits and observed collusion among suppliers.

The study employed a stratified random sampling method. This approach guaranteed representation from multiple public institutions. It included participants occupying different functional roles, ensuring a broad and balanced perspective. Stratification was based on the type of institution (ministries, parastatals, local authorities) and the role of participants (procurement officer, accountant, auditor). A total of 112 respondents participated in the study. This sample size was considered sufficient for regression analysis and Structural Equation Modelling (SEM), providing adequate statistical power for detecting significant relationships. Primary data were gathered using a structured questionnaire. It included sections on demographics, forensic accounting audits, supplier collusion, and procurement effectiveness. Responses were rated on a five-point Likert scale, ranging from 1 (Strongly Disagree) to 5

(Strongly Agree). The instrument was pretested on 15 participants from non-sampled institutions to assess clarity, reliability, and validity. Adjustments were made to ensure all items were understandable and relevant to the study objectives.

Data were collected over an eight-week period. Permission was obtained from relevant authorities in the selected institutions before distributing questionnaires. Participants were informed about the study's purpose and reassured that their responses would remain confidential. They were provided with clear instructions on completing the questionnaire. Data were collected both physically and electronically, depending on respondents' accessibility.

Data were analysed using SPSS. Descriptive statistics summarised respondents' demographics and responses, while regression analysis tested the relationship between forensic accounting audits and supplier collusion. Assumptions of normality, linearity, multicollinearity, and homoscedasticity were checked prior to regression. SEM in AMOS was also used to assess the direct and indirect effects of forensic accounting audits on procurement outcomes.

RESULTS AND DISCUSSION

Regression analysis confirmed a significant positive relationship between Forensic Accounting audits in Preventing Supplier Collusion (FAAPSC) and the effectiveness of Forensic Accounting in preventing Supplier Collusion in Zimbabwe's Public Procurement System (EFAPSC).

Table 1 The Effectiveness of Forensic Accounting in preventing Supplier Collusion in Zimbabwe's Public Procurement System (EFAPSC)

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Correlations			Collinearity Statistics	
	B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1												
(Constant)	1.822	.313		5.816	.000	1.201	2.443					
EFAPSC	.400	.096	.369	4.162	.000	.210	.591	.369	.369	.369	1.000	1.000

a. Dependent Variable: IPPS1

The findings demonstrated that implementing forensic accounting audits enhances the integrity and effectiveness of public procurement by mitigating supplier collusion. *Constant (β=1.822): The analysis shows a baseline Effectiveness of Forensic Accounting in preventing Supplier Collusion in Zimbabwe's Public Procurement System (EFAPSC) of 1.822, which is significantly above zero (p < 0.001), even without considering the effect of FAAPSC.*

FAAPSC Coefficient (β=0.400): This unstandardised coefficient indicates that for every one-unit increase in the application of forensic accounting audits (FAAPSC),

Effectiveness of Forensic Accounting in preventing Supplier Collusion in Zimbabwe's Public Procurement System (EFAPSC) increases by 0.400 units, holding all other factors constant (*ceteris paribus*).

Standardised Coefficient ($\beta = 0.369$): The standardised coefficient reveals a moderate positive effect size. This means that a one-standard-deviation increase in FAAPSC is associated with a 0.369-standard-deviation increase in EFAPSC. This metric allows for the comparison of the relative strength of this predictor in a multi-variable model.

The large t-value (4.162) and the highly significant p-value ($p < 0.001$) confirm that the effect of FAAPSC on EFAPSC is statistically significant and not due to chance. The 95% Confidence Interval (0.210 – 0.591) further supports this finding, as it does not include zero, indicating a reliably positive effect.

With only one predictor in the model, there are no issues with multicollinearity, as confirmed by a Tolerance and VIF of 1.000.

The regression results provide strong evidence that Forensic Accounting Audits in Preventing Supplier Collusion (FAAPSC) is a significant predictor of the Effectiveness of Forensic Accounting in preventing Supplier Collusion in Zimbabwe's Public Procurement System (EFAPSC). The moderate standardised Beta of 0.369 suggests that while FAAPSC is an important factor, other variables also contribute to procurement effectiveness. This finding implies that when forensic audits are employed to deter supplier collusion, procurement processes become more transparent, competitive, and efficient. These findings align with Institutional Theory. This theory posits that strong institutional frameworks and oversight mechanisms such as forensic audits are crucial for promoting compliance and discouraging deviant behaviours like collusion within an organization.

This research corroborates previous studies (OECD, 2025; Transparency International, 2024) that identify collusion as a persistent risk in public procurement. The positive impact observed is consistent with the experiences of countries like South Africa and Nigeria, which have reported improved competitive bidding and cost reduction after implementing similar fraud mitigation strategies.

For Zimbabwe, this study provided empirical support for integrating forensic accounting audits into the public procurement process. Given the history of supplier collusion and inflated costs, the evidence confirms that these audits can significantly enhance procurement outcomes, thus supporting the government's efforts to improve accountability under the "Public Procurement and Disposal of Public Assets Act".

As reflected in table 1.2 below most respondents agreed that forensic accounting audits effectively prevent supplier collusion in public procurement, with 43.8% agreeing and 38.4% strongly agreeing. Overall, 82.2% of participants supported the role of forensic accounting audits in curbing collusion. Only a small proportion of respondents opposed this view, with 6.2% disagreeing and 11.6% remaining neutral, indicating limited opposition but some uncertainty.

Table 2. Forensic Accounting Audits in Preventing Supplier Collusion in Zimbabwe's Public Procurement System (FAAPSC)

		Frequency	Percent	Valid Percent	Cumulative percent
Valid	Disagree	7	6.2	6.2	6.2
	Neutral	13	11.6	11.6	17.9
	Agree	49	43.8	43.8	61.6
	Strongly agree	43	38.4	38.4	100.0
	Total	112	100.0	100.0	

Form the results above that most stakeholders in Zimbabwe's public procurement system take forensic accounting audits as an effective mechanism for preventing collusion among suppliers. The high level of agreement suggests that practitioners and respondents purport forensic auditing as a tool for promoting fair competition, accountability, and integrity in public procurement.

There was a relatively small percentage of disagreement (6.2%). This suggests that while forensic audits are broadly accepted, there may be gaps in awareness, implementation, or enforcement, leading some to doubt their full effectiveness. The neutral group (11.6%) likely reflects the respondents who are cautious or have limited exposure to forensic auditing practices.

The results are consistent with the fraud theory frameworks (Cressey, 1953; Wolfe & Hermanson, 2004). Such frameworks emphasise that robust monitoring mechanisms reduce opportunities for collusion and fraudulent practices. Forensic audits act as deterrents by increasing the likelihood of detection.

The findings resonate with OECD (2025) and Transparency International (2024), which highlight that forensic auditing enhances procurement oversight and reduces risks of collusion in developing economies. Similar studies in Nigeria and Kenya have shown that forensic accounting audits help detect bid-rigging and cartel-like behaviours.

Zimbabwe has historically faced challenges of cartel-driven procurement and collusive tendering. The overwhelmingly positive response in this survey suggests strong support for embedding forensic accounting audits into procurement oversight structures basing on the “Public Procurement and Disposal of Public Assets Act” (PPDPA).

Table 3 Effectiveness of Forensic Accounting in preventing Supplier Collusion in Zimbabwe's Public Procurement System (EFAPSC)

		Frequency	Percent	Valid Percent
Valid	Strongly disagree	1	.9	.9
	Disagree	8	7.1	7.1
	Neutral	14	12.5	12.5
	Agree	47	42.0	42.0
	Strongly Agree	42	37.5	37.5

Majority of respondents Agreed (42.0%) and Strongly Agreed (37.5%). Together these made up 79.5% of respondents, showing strong consensus, that forensic accounting is effective in preventing collusion.

small proportion of respondents, 12.5%, were neutral, suggesting they may lack full awareness or experience with forensic accounting practices. Disagreement with the effectiveness of forensic accounting was minimal, with only 8.0% of participants expressing a negative view (7.1% disagreed and 0.9% strongly disagreed), indicating very limited opposition.

The results indicate that forensic accounting is widely regarded as an effective anti-collusion tool in Zimbabwe's public procurement system. Nearly four out of five respondents affirmed its effectiveness, underscoring that forensic audits play a critical role in promoting fairness, competitiveness, and accountability.

The small group of neutral and disagreeing respondents may point to challenges such as implementation gaps, limited technical expertise, or lack of adequate enforcement mechanisms that could weaken forensic accounting's potential impact.

These findings align with Institutional Theory, which holds that effective regulatory frameworks and monitoring mechanisms reduce deviant practices such as collusion. Forensic accounting strengthens institutional capacity by introducing investigative oversight (Onowu & Oludi, 2024). Studies from Kenya, Nigeria, and South Africa have similarly demonstrated that forensic accounting audits deter supplier cartels and improve procurement transparency (Adebayo, Adenle, Ojeleye, & Ayeni, 2024). (Organization for Economic Co-operation and

Development (OECD), 2025) also stresses the role of forensic audits in addressing collusive tendering.

In Zimbabwe, procurement scandals have often involved supplier cartels and bid rigging. The overwhelming agreement in Table 1.3 confirms that stakeholders believe forensic accounting can curb collusive behaviour, enhance compliance with the "Public Procurement and Disposal of Public Assets Act (PPDPA)", and restore public trust.

The model equation for your regression analysis is as follows.

$$EFAPSC = \beta_0 + \beta_1 FAAPSC + \epsilon$$

Where:

- a. EFAPSC is the dependent variable, representing the Effectiveness of Forensic Accounting in preventing Supplier Collusion in Zimbabwe's Public Procurement System FAAPSC is the independent variable, representing Forensic Accounting Audits in Preventing Supplier Collusion.
- b. β_0 is the constant or y-intercept (1.822), which is the predicted value of EFAPSC when FAAPSC is zero.
- c. β_1 is the unstandardized coefficient for FAAPSC (0.400), which represents the change in IPPS1 for a one-unit increase in FAAPSC.
- d. ϵ (epsilon) represents the error term, accounting for all other factors influencing EFAPSC that are not included in the model.

Conclusion

The regression analysis decisively confirms that forensic accounting audits play a statistically significant and positive role in preventing supplier collusion. This leads to an improved and more effective public procurement system in Zimbabwe. These findings underscore the importance of fraud mitigation in enhancing procurement integrity and achieving better value for money.

Table 1.2 demonstrates strong stakeholder confidence in forensic accounting audits as an anti-collusion measure in Zimbabwe's public procurement. The evidence supports the argument that forensic accounting audits significantly contribute to procurement integrity. This happens by discouraging supplier collusion, enhancing competition, and improving procurement efficiency.

Table 1.3 shows strong stakeholder confidence that forensic accounting is an effective measure to prevent collusion in Zimbabwe's public procurement. The high agreement rate

(79.5%) highlights forensic accounting as a strategic tool for strengthening procurement integrity and reducing systemic fraud risks.

The study had its limitations. Thus, to start with, it relied on a cross-sectional design, which captured perceptions and conditions at a single point in time. Thus, causal inference over time cannot be fully established. Secondly, the study sample, despite being diverse, was limited to selected ministries, parastatals, and oversight bodies. This could constrain the generalisability of the findings to all public entities in Zimbabwe. Third, while responses indicate strong support for forensic audits, the study did not directly measure long-term behavioural change among suppliers and procurement officials.

The findings underscore the need to institutionalise forensic accounting audits as a standard governance practice across public institutions. Strengthening enforcement mechanisms, building forensic audit capacity, and integrating advanced digital audit tools such as data analytics and blockchain-based procurement monitoring will be critical in enhancing fraud detection and prevention. Furthermore, continuous professional training for procurement and audit personnel will reinforce accountability, promote ethical behaviour, and deter collusive practices.

Boosting transparency, accountability, and competitive fairness would enable forensic accounting audits to offer a strategic pathway to restoring public confidence in Zimbabwe's procurement system. The insights generated by this study are relevant not only to Zimbabwe but also to other developing countries experiencing similar procurement integrity challenges. Future research should explore longitudinal assessments and comparative analyses to deepen understanding of forensic accounting's impact on public procurement governance.

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