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THE MODERATING EFFECT OF INTERNAL CONTROL SYSTEM ON THE RELATIONSHIP BETWEEN FORENSIC AUDITING TECHNIQUES AND FRAUD MITIGATION EFFICACY IN LISTED COMMERCIAL BANKS

Denis Kisienya[1],
Opanyi Robert[2],
Shavulimo Paul[2i]
[1]Masters Student,
Kaimosi Friends University,
Kenya
[2]Department of Accounting and Finance,
Kaimosi Friends Uiversity,
Kenya

Abstract:
The study evaluated the moderating effect of internal control system on the relationship between forensic audit techniques and fraud mitigation efficacy in listed commercial banks. The study focused on listed commercial banks in Kenya. The research was grounded in the fraud diamond theory, offering a comprehensive framework for understanding fraud dynamics. The study adopted a positivist philosophy and both descriptive and explanatory research designs, the study targeted forensic auditors, internal auditors, compliance officers, and bank managers using a census approach. Data was collected via structured questionnaires and analyzed through inferential statistics with aid of SPSS. Inferential statistics contained correlation analysis and regression analysis. The study results indicated that internal control system has a positive and significant moderating effect on the relationship between forensic audit technique and fraud mitigation efficacy. Overall, the findings suggest that optimal fraud mitigation in commercial banks is achieved by integrating strong internal control systems with forensic auditing techniques. Findings may guide banks, regulators, and policymakers in adopting forensic techniques more strategically, thereby strengthening fraud risk management, safeguarding institutional integrity, and enhancing financial sector stability.

JEL: M42, M41, K14

[i] Correspondence: email kisienyadennis@gmail.com, paulshavulimo@gmail.com, ropanyi@yahoo.com

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1. Introduction

Fraud mitigation efficacy entails the systematic processes and strategies institutions deploy to prevent, detect, and respond to fraudulent activities. In commercial banks, it integrates preventive controls, investigative procedures, and corrective actions to safeguard assets, maintain integrity, and protect stakeholders. Despite the adoption of internal controls and monitoring systems, fraud continues to escalate, driven by insider collusion, technological sophistication, and regulatory gaps (Adejumo & Ogburie, 2025). Forensic auditing has emerged as a strategic response, combining accounting, auditing, investigative, and legal techniques to strengthen fraud management (Đukic, Pavlović, & Grdinić, 2023). It encompasses fraud detection, deterrence, litigation support, forensic interviewing, and digital transaction analysis. By addressing embezzlement, misappropriation, and financial statement manipulation, forensic audits reinforce transparency, accountability, and institutional trust.

The body of literature available indicates that forensic audit practices have been employed by various institutions to prevent and detect frauds such as financial institutions (Đukic, Pavlović, & Grdinić, 2023). Emmanuel *et al*. 2018 states that "*forensic audit techniques comprise fraud investigation, detection and deterrence skills, forensic investigation, forensic interviewing skills, litigation, mediation and arbitration, and computer-assisted reviews and document reviews*".

Kaunda (2021) further added that forensic auditing practices involve the application of accounting, auditing, and investigative skills to examine financial information for use in legal proceedings and financial fraud management. In the banking sector, these practices play a vital role in safeguarding assets, ensuring compliance, and maintaining trust among stakeholders. One significant technique employed is the investigation of fraud, whereby forensic accountants assess suspicious transactions and disentangle the financial statement from the internal records to establish the existence of deceit, embezzlement, or the misappropriation of funds (Kaur, Sood, & Grima, 2023).

Sood and Bhushan (2020) pointed out that fraud has become a focal point for financial institutions. Insider fraud, which has been on the rise within many corporations, is attributed to younger, tech-savvy employees. This is the opposite of insider fraud controlled by the upper cadre, such as supervisors, managers and superiors within the organization. This scenario has resulted in fraud being ranked a major concern for banks and insurers in East Africa. Institutional trust is crucial for the detection and prevention of fraud. Most modern businesses, particularly those whose operations are purely online, are applying the principles of institutional trust in order to foster good governance as a means of financial fraud management. Fraud cases in Kenya's banking sector are rarely made public, but breaches and attempted frauds are increasing dramatically, behind the scenes, and exposing profound weaknesses in a first-digital environment (The Africa Report, 2025).

In addition, the internal banking control systems designed by the institutions have been put in place to reduce fraud. Banks divide the work among the staff. Routine audits have to happen frequently in the banking system. Employees monitor their suspicious activity personally. The banks also have set aside funds towards training the employees' fraud prevention and detection techniques (Anyona, 2024). Employees are trained in identifying and reporting suspected perpetrators. Banking institutions have also deployed technologies in their systems to enhance the detection and stopping of fraud. This includes the deployment of software fraud systems alongside transaction monitoring systems and the biometric identification systems (Maweu, Kiragu, & Kuria, 2024).

In commercial banks, a forensic audit is very important as it increases accountability and transparency, and helps banks track irregular activities. It brings together legal and financial knowledge and uses investigative and logical methods to recognize, prevent, and solve fraud and order disputes. Stakeholders should be able to trust the information provided, and forensic accounting techniques, though sophisticated, solve alignment issues (Matheri, 2024).

These techniques include targeted assessments, transaction analyses, data mining, expense analyses and lifestyle audits. Strengthened internal controls and compliance with financial governance, systems, and controls focus the blame on managers and employees only, correcting the behavior of the financial system as a whole, and ensuring ethical employee practices within the system. Most importantly, internal transparency should be observed as custodians of ethics (Gichuhi & Ngahu, 2024).

In addition, forensic accountants increase banks' visibility into internal systems and reports to outside stakeholders. This not only improves the bank's decision systems, but also saves it a lot of money due to the prevention of transparency compliance breaches (Wamboi, 2024). The ability to prevent fraud is just the start, and does not institute the understanding of responsibility and openness, which is required by banks. Without transparency and accountability, a bank's systems suffer, which disrupts the bank's performance over a long time (Kiplagat, Koske, & Chelogoi, 2024).

Globally, incidents such as the fraudulent account case involving Wells Fargo in the United States and the fraud involving Punjab National Bank in India are examples of how fraud undermines the trust of stakeholders and the integrity of financial institutions. Weak internal controls and regulatory loopholes frequently make the situation worse in economies that are still in the process of developing (DeLiema, Deevy, Lusardi, & Mitchell, 2020).

Further, corporate collapses such as Enron and WorldCom exposed the limitations of traditional audits in detecting complex fraud, leading to regulatory reforms like the Sarbanes-Oxley Act (2002), which institutionalized forensic auditing. Subsequent scandals, Wells Fargo (U.S.), Wirecard (Germany), Punjab National Bank (India), and the Moldova banking fraud, further underscored the systemic risks of weak fraud management and highlighted the critical value of forensic approaches in safeguarding financial integrity (Teichmann, Boticiu & Sergi, 2024; Pilkington, 2015).

In Germany, a report by Teichmann, Boticiu, and Sergi (2024) discovered that Wirecard, which was formerly a renowned fintech company, had been erroneously reporting cash balances of €1.9 billion that did not exist. Through the use of created third-party contacts and offshore accounts, this fraudulent activity was made possible. The case brought to light significant supervision shortcomings on the part of auditors and authorities (Teichmann, Boticiu, & Sergi, 2024).

In 2014, Moldova encountered one of the most significant banking scams in European history, involving the misappropriation of around $1 billion. The fraud was executed via a coordinated operation involving three significant banks: Banca de Economii, Banca Socială, and Unibank. These institutions extended non-performing loans to shell corporations, numerous of which were incorporated abroad with ambiguous ownership frameworks. The cash was thereafter channeled through a convoluted network of transactions and laundered through financial institutions in Latvia and the United Kingdom. The scandal precipitated a national economic crisis and significantly eroded public confidence in the banking sector and governmental institutions (Pilkington, 2015).

In 2023, EUROPOL orchestrated a comprehensive operation against a Europe-wide criminal syndicate implicated in fraudulent Value-Added Tax (VAT) claims related to cross-border transactions of electronic products. The scam manipulated the VAT system across many EU member states, leading to substantial financial losses in public income. Authorities confiscated assets amounting to more than €520 million. Investigations uncovered links between the network and organized criminal syndicates, including mafia-affiliated entities (JM-van-der-Hel & Griffioen, 2025).

Regionally, African economies continue to face escalating fraud threats. Countries such as Nigeria, Ghana, South Africa, Rwanda, Tanzania, and South Sudan grapple with cybercrime, insider embezzlement, and systemic misappropriation, with billions lost annually despite regulatory interventions (Olusegun & Bamgbose, 2022; Akinbowale, Klingelhöfer & Zerihun, 2024; Finex Insights, 2024). These persistent challenges reveal that while reforms exist, conventional fraud management remains inadequate, reinforcing the urgency of forensic audit adoption. Across Africa, forensic auditing has gained traction, with documented effectiveness in combating financial crime and restoring trust in financial systems.

In Nigeria, numerous prominent fraud cases surfaced in 2025. The allegations encompass the misappropriation of ₦8.5 billion by Wema Bank personnel, alongside a ₦12.3 billion fraud case involving former First Bank executives accused of exploiting credit facilities using counterfeit papers. Minor frauds, including customer impersonation for fund withdrawal and cash diversion by tellers, continue to occur, revealing systemic weaknesses in internal banking controls and verification mechanisms (Olusegun & Bamgbose, 2022).

Ghana is undergoing analogous tendencies. The Bank of Ghana reported that fraud-related losses in the banking industry amounted to GH¢63 million in 2023, a notable rise from the GH¢52 million documented in 2022. Insider participation persists:

In 2024, 155 bank employees were terminated for engaging in fraudulent actions, chiefly related to cash concealment and record manipulation. A significant case entailed a complex mobile money and SIM swap operation that allowed perpetrators to misappropriate almost GH¢113,000 by counterfeiting ECOWAS identity cards and infiltrating victims' mobile banking systems (Finex Insights, 2024).

South Africa is making efforts to mitigate cybercrime, including the establishment of the South African Banking Risk Information Centre (SABRIC). The SABRIC is tasked with the objective of reducing the risk of bank and organized related crimes by promoting inter-bank synergy and providing banking institutions with the requisite information regarding crime and risk management. Furthermore, the police's endeavors are also regarded as a constructive step in the ongoing effort to combat cybercrime. It works in conjunction with the banking institution and the IT industry to combat cybercrime and prosecute perpetrators through the SABRIC. South Africa has also implemented the Computer Security Incident Response Team (CSIRT) to promptly address cybercrime incidents (Akinbowale, Klingelhöfer, & Zerihun, 2024).

Locally, in Rwanda, anti-fraud measures were found in the banking sector, tax revenue collection, and consumer products. In 2013, the central bank implemented a new method for processing cheque payments targeted at combating cheque fraud. There was also the launch of a new core banking system called 'T24', which was designed to combat bank fraud. T24, in conjunction with another technology, Oracle e-Business Suite Enterprise Resource Planning, aimed to enhance the banking system and enable it to withstand fraudulent attacks. Both systems were being implemented by Temenos, an international market software provider headquartered in Geneva that provides banking software to over 90 banks across Africa, demonstrating the company's reach and influence in the African banking sector (Mykhalchenko & Wiegratz, 2021).

In South Sudan, fraud is a major danger to the integrity and stability of the financial industry globally. Fraud is defined as purposeful deceit for personal advantage and includes a variety of illegal crimes such as embezzlement, money laundering, and accounting fraud (Association of Certified Fraud Examiners). Commercial banks, as significant financial organizations, are especially vulnerable to such fraudulent activities due to the nature of their operations and the vast number of financial transactions they process (Mabior & Wanyama, 2024).

In Tanzania, commercial banks rely heavily on forensic investigations to detect and prevent financial fraud. Forensic accounting is a specialized discipline of forensic investigation that uses accounting skills to examine financial crimes. This comprises tactics such as data analysis, interviews, and financial statement examination in order to detect fraudulent acts and generate evidence for legal proceedings. Early detection and response to fraudulent actions is vital for retaining stakeholder trust, including depositors and investors (Mykhalchenko & Wiegratz, 2021).

The Central Bank of Kenya (CBK) regulates Kenya's banking system, which has had major examples of fraud such as insider lending, cybercrime, deposit embezzlement, and financial statement manipulation. According to reports from the Banking Fraud

Investigations Department (BFID) and the CBK, commercial bank fraud losses total billions of dollars each year. While statutory audits frequently fail to uncover fraud, forensic audit techniques, which include digital forensics, data mining, Benford's law, ratio analysis, and lifestyle audits, provide proactive ways for detection and prevention (Kaunda, 2021). Despite its promise, empirical information on the efficacy of forensic audit procedures in Kenya's publicly traded commercial banks is sparse (Gichuhi & Ngahu, 2024).

Standard audits are supposed to make sure that rules are followed and information is presented fairly, but they often fail to find complex financial wrongdoing. Digitalization, inadequate governance, and cooperation are making it easier for criminals to commit fraud against Kenyan commercial banks that are listed on the Nairobi Securities Exchange (NSE). The failures of Chase Bank (2016) and Imperial Bank (2015) show that fraud detection and prevention systems are not working well. Although there is a lot of support for forensic audits around the world, not much research has been done on how well it works in Kenyan banks. This study aimed to assess the moderating effect of internal control systems on the relationship between forensic audit techniques and fraud mitigation efficacy.

1.2 Statement of Problem

Commercial banks play a critical role in promoting economic stability through financial intermediation, the facilitation of fund transfers, and support of international trade. However, their operations remain highly vulnerable to financial crimes that exploit institutional, systemic, and technological weaknesses (Maweu, Kiragu, & Kuria, 2024). Across Africa, illicit financial flows are estimated to cost the continent approximately USD 50 billion annually, resources that could otherwise contribute significantly to economic development and debt reduction. In Kenya, undetected fraudulent activities are estimated to average about KShs. 40 billion annually, indicating substantial weaknesses in fraud prevention and detection mechanisms within financial institutions. Despite increased investments in internal controls, compliance systems, audits, and digital monitoring technologies, fraud incidents in the banking sector continue to rise. A PwC (2024) survey reports Kenya's financial crime prevalence at 58%, significantly higher than the global average of 47%. Similarly, the Central Bank of Kenya's Financial Sector Stability Report (2024) indicates that fraud cases in commercial banks increased from 153 cases in 2023 to 353 cases in 2024, while reported losses tripled from KShs. 680.9 million to KShs. 1.9 billion. Recent institutional incidents further highlight the severity of the problem: in May 2025, Equity Bank dismissed approximately 200 employees following an internal audit that uncovered a fraud scheme costing KShs. 1.5 billion, while KCB Group dismissed 34 staff members and reported blocking 339 fraud attempts, safeguarding KShs. 212.9 million in customer funds. These persistent fraud occurrences undermine public confidence, threaten institutional credibility, and expose vulnerabilities within Kenya's increasingly digitized banking environment. Globally, forensic auditing has emerged as a proactive approach for detecting, investigating, and

preventing complex financial fraud. However, despite its growing recognition, the application and effectiveness of forensic auditing techniques within Kenya's commercial banking sector remain insufficiently explored. Existing studies have largely examined internal controls, corporate governance, or conventional auditing practices, with limited empirical focus on how integrated forensic auditing techniques collectively influence fraud mitigation efficacy, particularly in listed commercial banks. Consequently, there remains a significant empirical and contextual gap regarding the extent to which forensic auditing techniques enhance fraud mitigation outcomes in Kenya's listed commercial banks. Addressing this gap is essential for strengthening accountability, improving financial reporting integrity, and enhancing fraud prevention strategies within emerging digital financial systems. Therefore, this study sought to evaluate the moderating effect of the internal control system on the relationship between forensic auditing techniques and fraud mitigation efficacy in listed commercial banks in Kenya.

1.3 Objective of the Study

To examine the moderating effect of the internal control system on the relationship between forensic auditing techniques and fraud mitigation efficacy in listed commercial banks.

2. Literature Review

2.1 Theoretical Literature Review

2.1.1 Fraud Diamond Theory

Wolfe and Hermanson in 2004 extended the classic Fraud Triangle by adding capability to the elements of pressure, opportunity, and rationalization. The theory argues that fraud arises not only when individuals face financial or personal pressures, perceive exploitable opportunities, and justify their actions, but also when they possess the skills, authority, or positional access required to execute and conceal fraud. It argues that fraud occurs when individuals not only face financial pressure, perceive opportunities, and justify their actions, but also possess the skills, position, or authority to exploit weaknesses (Popoola, 2014; Abdullahi, Mansor, & Nuhu, 2015).

Capability is critical: without the technical knowledge, authority, or access to manipulate records or override controls, fraud cannot occur even when pressures and opportunities exist (Ruankaew, 2016). Weak internal controls or poor oversight magnify this risk, allowing employees with privileged access to exploit systemic gaps (Rustiarini, Nurkholis, & Andayani, 2019; Omukaga, 2021). Motivational pressures extend beyond personal financial strain to include market expectations, regulatory requirements, or organizational performance targets (Ratmono & Frendy, 2022). Rationalization then provides a moral shield, enabling fraudsters to justify their actions as compensation, necessity, or entitlement (Yarana, 2023).

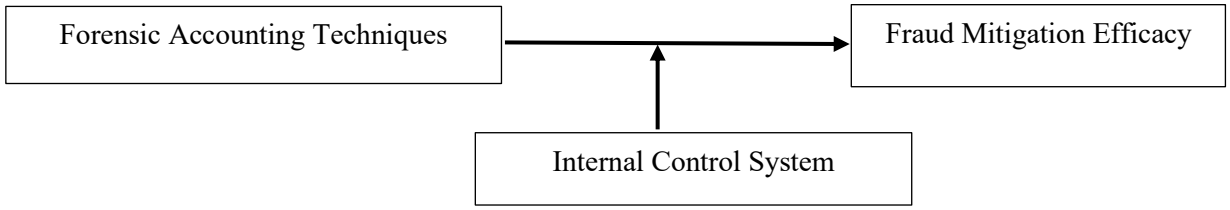
The fraud diamond thus provides forensic auditors with a lens for understanding vulnerabilities within banking systems and identifying potential perpetrators (Mohd-

Razmin, Mohamad & Zakaria, 2024). A fraudster needs particular traits, competencies, or positional authority to execute their illegal activities. Opportunities may facilitate fraud, individuals are motivated by incentives and rationalizations; however, for this to occur, the individual must recognize an opportunity when it arises and exploit any identified loopholes (Mohd-Razmin, Mohamad, & Zakaria, 2024).

In Kenya's commercial banks, where insider fraud and cyber-enabled schemes are rising, the fraud diamond underscores the need for forensic audit techniques that address all four elements. Digital forensics uncovers concealed transactions, data analytics exposes anomalies, forensic accounting disentangles manipulated records, and litigation support ensures accountability. By targeting not only opportunities but also perpetrators' capabilities, forensic audits strengthen fraud detection, prevention, and overall financial sector resilience.

2.2 Conceptual Framework

This section showed the relationship between forensic audit techniques and the fraud mitigation efficacy of the listed commercial banks in Kenya.



2.3 Literature Review

2.3.1 Forensic Auditing Techniques and Fraud Mitigation Efficacy

Forensic audit techniques combine accounting, auditing, and investigative methods to identify, document, and mitigate fraud. Studies show strong positive correlations between the adoption of forensic auditing techniques and the reduction of fraud incidents in banks. Kaur, Sood, and Grima (2023) conducted a systematic review examining the role of forensic audit g in fraud detection and prevention. The study synthesized findings from multiple empirical and conceptual works, concluding that forensic accounting significantly enhances transparency, accountability, and early detection of financial irregularities. It identified key forensic techniques such as data analytics, digital forensics, and litigation support as critical tools for detecting both internal and external fraud. The review also emphasized the importance of professional skepticism, auditor competence, and ethical standards in achieving effective outcomes. However, the study noted major gaps in developing economies, where limited technological infrastructure, weak enforcement mechanisms, and inadequate forensic expertise hinder full implementation. It further highlighted the lack of integrated models combining forensic auditing with emerging technologies like artificial intelligence. These gaps point to the need for contextual research, such as in Kenya's commercial banks, to

explore how forensic auditing techniques can be effectively institutionalized to enhance fraud management and strengthen financial reporting quality.

Further, Ewa (2022) investigated the relationship between forensic audit and fraud management in Nigeria, emphasizing the growing importance of forensic techniques in mitigating financial misconduct. The study found that the application of forensic auditing tools significantly improves fraud detection and strengthens internal control systems. It also highlighted that forensic accounting enhances transparency and accountability within financial institutions. However, the study was limited by its reliance on self-reported data and a narrow geographical scope, which may affect the generalizability of findings. Additionally, it did not examine the integration of modern technologies such as artificial intelligence or data analytics in forensic auditing processes. These limitations suggest a research gap that can be addressed by examining how diverse forensic auditing techniques contribute to financial fraud management in more technologically dynamic environments like Kenya's listed commercial banks.

Further, Emmanuel, Enyi, and Olajide (2018) assessed the significance of forensic audit techniques in maintaining the integrity of financial accounts. Stakeholders who are members of recognized professional accountancy bodies in Nigeria were solicited to respond to research inquiries. This study employed a survey research methodology utilizing primary data and purposive random sampling procedures. The sample size was determined using the formula established by Krejcie and Morgan (1970). Three hundred fifty copies of the questionnaires were distributed, and three hundred twenty-ones were returned, constituting 92% of the total questionnaires. The nominal scale method was employed in the demographic section. Forensic accounting approaches positively impact the integrity of financial statements (IFS) in commercial organizations.

Finally, Eko, Adebisi, and Moses (2020) assessed the utilization of forensic audit methodologies in the prevention and detection of fraudulent activities inside Nigerian commercial banks. The application of descriptive statistics and the Ordinary Least Squares (OLS) model showed that forensic accounting approaches dramatically improved the detection and prevention of fraud within the financial system. The study additionally highlighted the significance of ratio analysis and trend analysis techniques in the detection and prevention of fraud. The study highlighted the significance of commercial data mining software in fraud detection and prevention, as well as the insufficient capacity and understanding among most staff regarding the functionalities of data mining technology, along with the application of trend analysis techniques in identifying and mitigating fraud within banks.

2.4.2 Internal Control System and Fraud Mitigation Efficacy

The literature reviewed indicates that internal control systems are essential tools for fraud prevention and detection in organizations. Researchers have consistently found that effective internal controls reduce opportunities for fraud, enhance accountability, and strengthen financial management practices. Rashid (2022) examined the role of internal control in fraud prevention and detection and established that strong internal control

mechanisms significantly reduce the occurrence of fraudulent activities. The study emphasized the importance of segregation of duties, authorization procedures, monitoring activities, and internal audits in safeguarding organizational assets and enhancing fraud detection capabilities.

Similarly, Musyoki (2023) investigated the role of internal control systems in financial fraud prevention in Kenya and found that effective internal controls significantly contribute to reducing financial fraud. The study revealed that organizations with robust control environments experience greater transparency and accountability in financial operations. However, the author noted that the effectiveness of internal controls largely depends on management commitment and consistent enforcement of established procedures.

In the context of deposit-taking Savings and Credit Cooperative Organizations (SACCOs) in Kenya, Wanjala and Riitho (2020) examined the relationship between internal control system implementation and fraud mitigation. Their findings revealed a significant positive relationship between the implementation of internal control systems and the reduction of fraud incidents. The study highlighted the importance of risk assessment, control activities, and monitoring mechanisms in minimizing fraudulent practices within financial institutions.

Likewise, Handoyo et al. (2021) investigated the influence of internal audit and internal control on fraud prevention. The study established that both internal auditing and internal control systems significantly enhance fraud prevention efforts by strengthening compliance, improving monitoring activities, and identifying weaknesses within organizational processes. The authors concluded that internal audits complement internal controls by providing independent assessments of the effectiveness of organizational control systems.

Further, Abei (2021) examined the impact of internal control on fraud detection and prevention in microfinance institutions and found that effective control systems improve the timely detection of fraudulent activities and minimize financial losses. The study emphasized the need for continuous monitoring, employee training, and periodic review of internal control procedures to enhance organizational resilience against fraud. Overall, the reviewed studies demonstrate a consensus that internal control systems play a critical role in preventing and detecting fraud across different organizational settings. Commonly cited control mechanisms include segregation of duties, authorization procedures, risk assessment, internal auditing, and continuous monitoring. While the studies consistently report a positive relationship between internal controls and fraud mitigation, they also emphasize that the effectiveness of these systems depends on proper implementation, management support, and regular evaluation. Therefore, strengthening internal control systems remains a fundamental strategy for organizations seeking to enhance financial integrity and reduce exposure to fraud.

3. Study Methodology

3.1 Research Philosophy

This study adopted a positivist research philosophy, which assumes a single, objective reality that can be observed, measured, and quantified. Positivism emphasizes empirical evidence, statistical analysis, and logical reasoning to test hypotheses and identify causal relationships. It aligns with the generation of objective, measurable, and generalizable findings, similar to approaches used in the natural sciences (Marsonet, 2019). By employing a structured and systematic methodology, positivism enables the study to produce reliable numerical data, establish cause-and-effect linkages, and provide actionable insights into the impact of forensic audit techniques on fraud mitigation efficacy (Sekaran & Bougie, 2016).

3.2 Research Design

This study employed a combined descriptive and explanatory research design**.** The descriptive component captures the current application and utilization of forensic audit techniques, digital forensics, data analytics, forensic accounting, and legal and litigation methods within Kenya's listed commercial banks. The explanatory design investigated the causal relationships between these forensic audit techniques and the effectiveness of financial fraud detection and prevention, providing insights into how specific practices influence fraud management outcomes. This dual approach ensures both a comprehensive overview and a rigorous analysis of the mechanisms driving financial fraud control.

3.3 Target Population

Target population parameters are crucial for delineating population size and other pertinent aspects relevant to any investigation. Cooper and Schindler (2006) defined population as the group of interest for researchers, which essentially denotes the unit of study comprising individual participants from whose measurements will be obtained. The target population for this study consisted of 11 commercial banks that were operational as of 2025. The study concentrated on individuals responsible for fraud mitigation in commercial banks, as each bank possesses a fraud investigation unit. Consequently, data was obtained from the fraud investigation units at the headquarters of each commercial bank. Primary data was obtained from internal auditors, compliance officers, ICT officers and bank managers. Secondary data from CBK and BFID reports. Table 3.1 shows the target population of the study.

Table 3.1: Target Population

Category	Number
ICT officers	22
Internal auditors	22
Compliance officers	22
Bank Managers	11
Total	**77**

3.4 Sampling Technique

The study adopted a census sampling technique. The census sampling technique was suitable for this study since the entire population is small, accessible, and critical for accurate findings. It further eliminates sampling errors, ensures full representation of diverse characteristics, and enhances the reliability of results. In this study, a census is appropriate since all units are few and manageable, allowing comprehensive data collection and generalizable conclusions without relying on inference. Therefore, this study will collect data from all respondents in Table 3.1.

3.5 Data Collection Instruments

Structured questionnaires were used to gather primary data. This is selected due to the technical nature of the scale's items and the requirement to ensure the validity of the respondent's response. There were two sections of the questionnaire that will be created for this study. The demographic and operational parameters in the first section are used to ascertain fundamental issues, such as the respondents' demographics. The second section will deal with the study variables. The study also obtained secondary data from audited CBK and BFID reports.

3.6 Data Analysis and Presentation

Data collected were cleaned, sorted, and coded before being analyzed using inferential statistics with the aid of the Statistical Package for the Social Sciences (SPSS). The analyzed data were presented using tables and figures to facilitate interpretation. The relationship between the study variables was examined using Pearson correlation analysis and multiple regression analysis. Pearson correlation analysis was used to determine the strength and direction of the relationship between forensic auditing techniques and fraud mitigation efficacy.

Further, multiple regression analysis was conducted to determine the effect of forensic auditing techniques on fraud mitigation efficacy in listed commercial banks. In addition, the study incorporated the internal control system as a moderating variable to examine its effect on the relationship between forensic auditing techniques and fraud mitigation efficacy. This helped determine whether the presence of a strong internal control system enhances the effectiveness of forensic auditing techniques in mitigating fraud.

The regression equations will be as follows:

3.7 Model 1: Moderating Variable Model

$$FME = \beta_0 + \beta_1 ICS + \beta_2 FA + \beta_3 FA.ICS + \varepsilon \quad (3.1)$$

Whereby:
FME = Fraud Mitigation Efficacy,
FA = Fraud Audit Techniques,
ICS = Internal Control System,
β1, β2, β3=Regression Coefficients,
ε = Error term.

4. Data Analysis, Presentation and Discussion

The study examined the moderating effect of the internal control system on the relationship between forensic auditing techniques and fraud mitigation efficacy in listed commercial banks. The results are presented in Table 2.

Table 4.1: Regression Coefficients with internal control system as moderating variable

Model		Unstandardized Coefficients		t	Sig.
		B	Std. Error		
2	(Constant)	.084	.053	2.575	.000
	ICS	.586	.081	7.235	.002
	FA	.657	.187	3.513	.000
	FA.ICS	.723	.168	4.304	.000

Source: Study Data 2026

The regression results in Model 2 examine the role of the internal control system (ICS) as a moderating variable in the relationship between forensic auditing techniques and fraud mitigation efficacy (FME). The estimated regression model is expressed as:

$$FME = 0.084 + 0.586ICS + 0.657FA + 0.723FA.ICS \quad (4.2)$$

The study examined whether the Internal Control System (ICS) alters the strength of the relationship between forensic auditing techniques (FA) and fraud mitigation efficacy (FME) in listed commercial banks. This was achieved by incorporating an interaction term (ICS.FA) in the regression model. The results provide strong empirical evidence of moderation, as the interaction coefficient is positive and statistically significant ($\beta = 0.723$, $p < 0.05$). This finding confirms that ICS does not merely operate as an independent predictor of fraud mitigation but plays a conditional role by influencing how effectively forensic auditing techniques translate into improved fraud outcomes. In essence, the presence and quality of internal controls determine the extent to which forensic auditing contributes to fraud prevention and detection.

The positive sign of the interaction coefficient ($\beta = 0.723$) is particularly important, as it indicates the direction of the moderating effect. Specifically, it shows that stronger

internal control systems amplify the effectiveness of forensic auditing techniques. This means that as banks enhance their control environments, through mechanisms such as segregation of duties, robust internal audit functions, continuous monitoring systems, and strict compliance procedures, the impact of forensic auditing on fraud mitigation becomes significantly stronger. Conversely, in banks where internal control systems are weak or poorly implemented, the effectiveness of forensic auditing techniques is diminished. Even when advanced forensic tools are employed, their ability to reduce fraud is constrained if there are no structured systems to act on the findings. Therefore, the moderating effect is not only statistically significant but also practically meaningful in explaining variations in fraud mitigation outcomes across institutions.

In addition to its moderating role, the internal control system also demonstrates a strong and statistically significant direct effect on fraud mitigation efficacy ($\beta = 0.586$, $p < 0.05$). This suggests that internal controls independently contribute to reducing fraud, regardless of the level of forensic auditing techniques applied. Internal controls establish the foundational framework for accountability, transparency, and risk management within banks. They ensure that processes are properly documented, transactions are authorized and verified, and anomalies are quickly detected and addressed. As such, even in the absence of highly sophisticated forensic auditing practices, a strong internal control system can still play a critical role in minimizing fraud risks. However, the findings further reveal that the combined effect of internal controls and forensic auditing techniques is substantially greater than their individual contributions.

A comparison of coefficients shows that the interaction effect ($\beta = 0.723$) is stronger than the direct effect of forensic auditing techniques ($\beta = 0.657$). This indicates that the joint application of forensic auditing and internal control systems produces a synergistic effect on fraud mitigation. In practical terms, forensic auditing techniques such as data analytics, digital forensic tools, forensic accounting procedures, and legal investigation methods are more impactful when embedded within a well-structured control environment. For example, data analytics may identify suspicious transaction patterns, but without internal controls to enforce follow-up actions, such as freezing accounts, initiating investigations, or escalating issues to management, the detection does not translate into mitigation. Internal controls, therefore, act as an enabling mechanism that transforms forensic insights into actionable outcomes.

Furthermore, the results highlight that internal control systems provide the necessary infrastructure for the effective utilization of forensic auditing outputs. They support evidence preservation, ensure data integrity, and facilitate timely decision-making. This is particularly critical in modern banking environments characterized by high transaction volumes and increasing digitalization. Forensic auditing techniques are designed to uncover hidden patterns and anomalies within large datasets, but their success ultimately depends on the institution's ability to respond swiftly and appropriately. Strong internal controls ensure that once fraud indicators are detected, there are clear procedures and responsibilities for addressing them. This reduces delays, minimizes losses, and enhances overall fraud management effectiveness.

The findings also carry important theoretical implications. They support the view that fraud mitigation is not solely a function of detection capabilities but is equally dependent on organizational systems that govern response and enforcement. The moderating role of ICS aligns with the broader understanding that control environments shape the effectiveness of risk management tools. In this context, forensic auditing techniques represent the "detection mechanism," while internal control systems serve as the "response mechanism." The interaction between the two determines the overall success of fraud mitigation strategies. This reinforces the argument that investments in forensic technologies must be complemented by equally strong investments in internal control frameworks.

From a practical perspective, the results suggest that banks should adopt an integrated approach to fraud management. Rather than relying exclusively on forensic auditing techniques, institutions should prioritize strengthening their internal control systems to maximize the benefits of these techniques. This includes enhancing internal audit functions, implementing real-time monitoring systems, improving compliance structures, and ensuring that staff are adequately trained in control procedures. By doing so, banks can create an environment in which forensic auditing techniques operate at their full potential.

In conclusion, the moderation analysis demonstrates that the internal control system plays a dual and critical role in fraud mitigation. It not only has a direct positive effect on fraud mitigation efficacy but also significantly strengthens the relationship between forensic auditing techniques and fraud outcomes. The positive and significant interaction effect confirms that the effectiveness of forensic auditing is contingent upon the strength of internal controls. Therefore, banks with robust internal control systems are better positioned to leverage forensic auditing techniques for optimal fraud detection and prevention. These findings underscore the importance of aligning technological capabilities with organizational control structures to achieve sustainable and effective fraud risk management.

5. Conclusions and Recommendations

5.1 Conclusions

The study concludes that the Internal Control System (ICS) plays a significant moderating role in the relationship between forensic auditing techniques and fraud mitigation efficacy among listed commercial banks. The positive and statistically significant interaction coefficient ($\beta = 0.723$, $p < 0.05$) demonstrates that the effectiveness of forensic auditing techniques in reducing fraud is largely dependent on the strength of the internal control environment. This implies that forensic auditing techniques achieve better fraud prevention and detection outcomes when they operate within institutions that have well-established internal control systems. Consequently, banks with stronger controls are able to maximize the benefits derived from forensic auditing practices.

The findings further indicate that the Internal Control System has a direct and positive influence on fraud mitigation efficacy ($\beta = 0.586$, $p < 0.05$). This suggests that internal controls independently contribute to reducing fraud by promoting accountability, transparency, compliance, and effective risk management. Strong internal controls help prevent irregularities, detect suspicious activities promptly, and ensure that corrective actions are taken in a timely manner. Therefore, internal controls remain a critical component of fraud management regardless of the level of forensic auditing employed within an organization.

The study also concludes that the combined application of forensic auditing techniques and internal control systems produces a greater impact on fraud mitigation than either approach operating independently. The interaction effect ($\beta = 0.723$) is stronger than the direct effect of forensic auditing techniques ($\beta = 0.657$), demonstrating a synergistic relationship between the two variables. This finding suggests that internal control systems provide the necessary operational framework that enables forensic auditing findings to be effectively implemented. Consequently, successful fraud mitigation requires both robust detection mechanisms and strong institutional response systems working together.

Furthermore, the study concludes that effective fraud mitigation is not solely dependent on the ability to detect fraudulent activities but also on the organization's capacity to respond appropriately. While forensic auditing techniques serve as a powerful fraud detection mechanism, internal control systems function as the response and enforcement mechanism that ensures identified fraud risks are addressed. The integration of these two elements, therefore, enhances overall fraud management effectiveness and contributes to the sustainability and integrity of banking operations.

5.2 Recommendations

Based on the findings, the study recommends that commercial banks strengthen their internal control systems to enhance the effectiveness of forensic auditing techniques. Management should continuously improve control measures such as segregation of duties, authorization procedures, internal audits, compliance monitoring, and risk assessment processes. Strengthening these controls will create an environment that supports the successful implementation of forensic audit findings and improves fraud mitigation outcomes.

The study further recommends that banks adopt an integrated fraud management approach by aligning forensic auditing techniques with internal control processes. Rather than treating forensic auditing as a standalone activity, institutions should ensure that forensic audit findings are systematically incorporated into existing control and governance frameworks. Such integration will facilitate prompt corrective actions, improve accountability, and enhance the institution's ability to prevent and detect fraud. Commercial banks should also invest in advanced technological tools and real-time monitoring systems that complement both forensic auditing and internal control functions. The increasing digitalization of banking operations requires sophisticated

fraud detection mechanisms capable of identifying suspicious transactions and emerging fraud patterns. Investments in data analytics, digital forensic tools, and automated monitoring systems will strengthen fraud detection capabilities and support more effective fraud mitigation efforts.

In addition, banks should prioritize continuous staff training and capacity development in forensic auditing, fraud investigation, and internal control procedures. Employees, auditors, compliance officers, and managers should be equipped with the necessary skills and knowledge to identify fraud risks, implement control measures, and respond effectively to fraud incidents. Regular training programs will enhance institutional competence and improve the overall effectiveness of fraud management strategies.

The study also recommends that regulatory authorities and policymakers encourage financial institutions to strengthen both forensic auditing practices and internal control systems through policy guidelines, regulatory oversight, and periodic assessments. Regulatory support can help establish industry standards and promote best practices that enhance fraud prevention and detection across the banking sector.

Finally, future research should explore other organizational and environmental factors that may influence the relationship between forensic auditing techniques and fraud mitigation efficacy. Variables such as corporate governance, organizational culture, technological innovation, and management commitment may provide additional insights into effective fraud management practices. Similar studies may also be conducted in other financial institutions and sectors to enhance the generalizability of the findings.

Conflict of Interest Statement
The authors declare no conflicts of interest.

About the Author(s)
Denis Kisienya is a Master's student at Kaimosi Friends University with a strong interest in accounting, finance, and business research.

Dr. Robert Opanyi serves as the Chair of the Department of Accounting and Finance at Kaimosi Friends University.

Paul Shavulimo is a Lecturer in the Department of Accounting and Finance at Kaimosi Friends University. He specializes in accounting, financial analysis, taxation, and business management.

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