EFFECT OF FORENSIC ACCOUNTING TECHNIQUES ON FRAUD DETECTION AMONG COMMERCIAL BANKS IN KENYA

BY

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MASTERS OF SCIENCE IN COMMERCE (FINANCE AND ACCOUNTING)

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DECLARATION

I declare that this dissertation is my original work and has not been previously published or submitted elsewhere for award of a degree. I also declare that this contains no material written or published by other people except where due reference is made and author duly acknowledged.

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I do hereby confirm that I have examined the master's dissertation of

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And have certified that all revisions that the dissertation panel and examiners recommended have been adequately addressed.

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Dr. Gladys Bunyasi

ABSTRACT

This study investigated the effect of forensic accounting techniques on fraud detection among commercial banks in Kenya. The specific objectives were to determine the effect of forensic data analysis on fraud detection, examine the role of financial document verification in enhancing fraud detection, and evaluate the effect of forensic investigation on fraud detection among commercial banks. The study was anchored on the Routine Activity Theory, Rational Choice Theory, and Fraud Triangle Theory, which provided a strong theoretical framework for understanding the dynamics of fraud and the role of forensic accounting in combating financial crimes. The target population comprised all 43 registered and licensed commercial banks in Kenya as listed by the Central Bank of Kenya. Data were collected through structured questionnaires administered to senior finance, audit, and risk officers with at least two years of continuous service. Since the population was fewer than 100, a census approach was adopted to ensure comprehensive coverage and eliminate sampling bias. The data were analyzed using descriptive and inferential statistics with the aid of SPSS Version 26.0. The analysis indicated that forensic data analysis had a strong positive relationship with fraud detection, while financial document verification showed a moderate positive relationship. Further examination revealed that both forensic data analysis and financial document verification significantly enhanced fraud detection among commercial banks. In contrast, forensic investigation did not appear to have a meaningful effect. Overall, the combined forensic accounting techniques were found to play a substantial role in explaining variations in fraud detection, highlighting their importance in improving banks' ability to identify and prevent fraudulent activities. The study concluded that forensic data analysis and financial document verification significantly enhanced the detection and prevention of fraudulent activities in commercial banks. However, forensic investigation was found to be less effective, possibly due to inadequate investigative tools and limited personnel training. The study recommended that commercial banks strengthen their forensic data analysis systems by investing in advanced data analytics software and continuous staff training. In addition, banks should enhance document verification procedures through digital authentication and block chain technologies to improve transparency and reduce manipulation. Finally, capacity-building initiatives should be prioritized to improve the effectiveness of forensic investigations and align them with emerging financial fraud trends.

Key words: *Forensic accounting, fraud detection, commercial banks, data analysis, and financial document verification.*

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DEDICATION

This dissertation is dedicated with heartfelt with gratitude to my entire household and to everyone who have supported me in various ways. My deepest appreciation has goes to my incredible parents for their love and encouragement. May Almighty Lord bless you all abundantly.

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LIST OF ABBREVIATION

AI	Artificial Intelligence
AUC	Area under the Curve
CBK	Central Bank of Kenya
IDEA	Interactive Data Extraction and Analysis
IFMIS	Integrated Financial Management Systems
KBA	Kenya Bankers Association
KCB	Kenya Commercial Bank
ML	Machine learning
PR	Precision-Recall
RBV	Resource-Based View
ROC	Receiver Operating Characteristic
U.S	United States

DEFINITION OF TERMS

Commercial banks:	Financial institutions that provide deposit, lending, and investment services to individuals and businesses, often requiring strong internal controls to prevent and detect fraud. (Mwangi & Otieno, 2023).
Financial document verification:	A process of authenticating and validating financial statements, receipts, and records to ensure accuracy and detect falsification or manipulation in banking transactions. (Otieno, 2023).
Forensic accounting techniques:	Specialized methods used to examine financial records and transactions to uncover, analyze, and prevent fraudulent activities within commercial banks. (Mkhize & Moyo, 2019)
Forensic data analysis:	The examination of digital and financial data using analytical tools to trace irregularities, identify fraud patterns, and gather evidence in commercial banking operations.
Forensic investigation:	A structured inquiry conducted by financial experts to collect, analyze, and interpret evidence of fraudulent activities within commercial banks for legal or regulatory action (Mwangi & Otieno, 2023).
Fraud detection:	The systematic process of identifying, monitoring, and investigating suspicious financial activities or transactions that indicate possible fraud in commercial banks. (Mosoti and Yatich, 2021)

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Forensic accounting techniques and fraud detection practices have advanced in the rise from the United States and Europe. Forensic accounting became popular in the U.S. during the early 20th century, partly because of the increasing sophistication of corporate fraud and financial crimes. Notable instances, like the highly publicized Enron fraud case, set the stage for the development of specialized fraud detection methodologies and more sophisticated forensic data analysis (Ellili & AlShalloudi, 2024).

Forensic accounting techniques include reviewing substantially large datasets to uncover patterns, inconsistencies, and anomalies for the purpose of identifying fraud. Insofar as forensic accounting technology includes various data analytic tools, such as IDEA (Interactive Data Extraction and Analysis) and ACL (Audit Command Language) have strengthened the proactive detection of fraud in the processing of financial records and provide directors with actionable knowledge (Ellili, et. al, 2024).

Forensic accounting practices were first developed in Europe during the industrial revolution, to response to the prevalence of financial fraud in banking and trade during that time. The United Kingdom and other countries in Europe were seeking to successfully utilize forensic accounting in legal cases where fraud existed. Today, fraud detection has been enhanced in Europe due to innovation and modern technology in data analytics. Technologies like artificial intelligence (AI) and machine learning (ML) assist forensic accountants in predicting and preventing fraud by looking at trends in transactions. These improvements in

technology have now made forensic accounting a fast-paced industry that provides information that is critical for corporate integrity and regulatory compliance (Al-Raggad 2024).

The rise of forensic accounting techniques in Africa has been linked to the increase of financial crimes and corruption. In Nigeria, for example, forensic accounting has become vital in dealing with issues of fraud and financial mismanagement in both the public and private sectors. Eco-friendly technological advances in data analysis techniques, such as Benford's Law and forensic audits, can detect fraud by analyzing anomalies of financial statements. Forensic accounting technologies, like blockchain for secured financial transactions, have also been a key player for financial transparency (Rohilla, 2024).

In South Africa, forensic accounting has been widely adopted to address issues of corporate fraud and embezzlement. The use of forensic data analysis techniques, including fraud risk assessments and anomaly detection, has significantly improved fraud detection. Advanced technologies like data visualization tools enable forensic accountants to identify and communicate fraudulent activities effectively. Investigative techniques, such as interviewing witnesses and analyzing financial trails, have been pivotal in prosecuting fraud cases, showcasing the country’s robust approach to forensic accounting (Mokhomole, 2023).

In Morocco, forensic accounting has evolved to address the challenges of financial crime within its growing economy. Data analysis techniques, such as trend analysis and predictive modeling, have advanced to uncover fraud in industries like banking and real estate. Forensic accounting technologies, including electronic discovery tools, facilitate the retrieval and analysis of digital evidence. Investigative techniques, such as cross-referencing financial documents with real-time data, enhance the accuracy and efficiency of fraud detection efforts in Morocco (Gore, 2025).

In East Africa, forensic accounting is gaining momentum as governments and organizations address financial fraud and corruption. In Tanzania, data analysis techniques such as transaction monitoring and forensic audits have advanced significantly, enabling the detection of irregularities in tax and procurement processes. Forensic accounting technologies, such as integrated financial management systems (IFMIS), have improved accountability by providing real-time data analysis capabilities. Investigative techniques, including lifestyle audits and asset tracing, are widely used to uncover concealed wealth and fraudulent activities (Daoud, 2023).

In Uganda, forensic accounting techniques are employed to address fraud in public procurement and financial management. Data analysis techniques, such as audit trails and variance analysis, have been enhanced through the use of advanced software tools. Forensic technologies, including cloud-based data analytics platforms, enable efficient fraud detection and prevention. Investigative approaches, such as interviewing key personnel and reviewing electronic communications, have also proven effective in uncovering fraudulent schemes (Naz and Karim, 2024).

In Somalia, forensic accounting remains a developing field, but efforts are underway to strengthen fraud detection capabilities. Data analysis techniques, such as cash flow analysis and ledger reviews, have been advanced to identify inconsistencies in financial records. Forensic technologies, including mobile-based financial monitoring systems, are being adopted to improve transparency in aid distribution. Investigative techniques, such as verifying documentation and conducting on-site inspections, play a crucial role in fraud detection in Somalia (Alao and Ogundajo, 2023).

In Kenya, forensic accounting has been embraced as a vital instrument for fighting against the problems of financial fraud and corruption. Forensic data analysis techniques, such as financial ratio analysis and trend analysis, have been utilized in an effort to detect fraud across all sectors. Technology such as blockchain and artificial intelligence-enabled analysis have been increasingly exploited to improve transparency and accountability in all financial transactions. Lifestyle audits, an example of forensic investigation methods, and asset tracing are also commonly utilized to detect misused funds (Nzioki, 2022).

In Commercial Banks in Kenya, forensic accounting is critical in responding to issues such as money laundering, and insider fraud. Advanced data analysis techniques such as predictive modelling, and fraud risk assessments, provide banks with tools to detect and prevent potential fraud schemes. Real-time transaction monitoring systems are forensic technologies which banks can implement to detect suspicious activity. Additional forensic investigative techniques such as document verification and employee background checks further bolster fraud detection (Nzioki, 2022). The results of this research indicate the importance of integrating forensic accounting practices to the banking sector in Kenya as they help to protect the integrity of financial transactions, and foster economic stability (Nzioki, 2022).

1.1.1 Forensic Accounting Techniques

Forensic accounting techniques have become increasingly sophisticated globally, driven by technological advancements and the growing need for effective fraud detection and financial crime prevention. Globally, forensic accounting is defined by several key metrics that include the frequency of data audits, the error detection rate, and the time taken for data analysis (Smith & Thomas, 2023).

Forensic data analysis can be described as a methodical preparation of reviewing a vast amount of financial and operation data in order to observe oddities, variances, or concealed operations, which might indicate fraudulent actions in commercial banks. The technique is a combination of statistical techniques, computer-assisted auditing, and data mining instruments to identify anomalies in the financial statements that would otherwise be missed by the traditional audit (Musyoka, 2023).

It is also extensively applied in detection of activities like insider fraud, money laundering, unauthorized transactions and falsified accounting entries. In the financial industry, data analysis can be used in forensic manners to give management and regulators the power to proactively evaluate risks and put preventive barriers against fraud in place. It is a critical security because of its accuracy that makes it an important element of accuracy, transparency, and trust in the financial activities of commercial banks (Rohilla, 2024).

Sule et,al (2019) notes that the nature of financial information and the chances of fraudsters hiding anomalies have risen because of the fast digitization in commercial banks. Research contends that forensic data analysis is a better system than traditional auditing because it applies the sophisticated analytics, real-time tracking, and machine learning algorithms to identify suspicious financial transactions. Mwangi and Otieno, (2023) emphasized the fact that this strategy increases regulatory adherence and improves internal control systems. They have also noted that any analysis of forensic data needs multi-skilled practitioners, heavy investment in technology, and constant revision to keep pace with the marketplace since fraudsters will continue to adjust to new systems and practices with time.

Muthoni, et, al (2022) hypothesized that forensic data analysis as a method allows banks to scan through large volumes of transaction data and point out anomalies that might

signal fraud. It helps to detect early and offer evidence-based results to investigate. Nevertheless, its weaknesses are that it is very expensive to run, requires continuous software changes, and that there is a lack of personnel who may have both accounting and data science skills. Also, excess use of automated detection can create false positives, which result in unnecessary investigations and resource burdens.

Forensic accounting is accounting, auditing and investigational art that employs the use of accounting, auditing and investigating skills to analyze financial statements and transactions in order to identify fraud in commercial banks. It integrates accounting skills with legal skills to uncover fraudulent misstatements, embezzlement and asset hiding. Forensic accountants examine financial records to identify the accuracy of records, to reveal any manipulations, and compile extensive reports, which can be presented in a court of law (Mutiso & Okoth,2023).

Wachira and Otieno (2022) hypothesized that forensic accounting is critical in preventing financial fraud in the banking sector. According to some scholars, forensic accounting methods extend past traditional audits to incorporate a more investigative method, which exposes an underlying manipulation of financial records. Njoroge and Kamau, (2023) confirmed that forensic accounting as a methodology can give commercial banks an investigative edge about suspicious transactions and can be presented in court as evidence. It allows detection of fraud schemes like defaults on loans, misstatements of revenue and internal embezzlement to be detected accurately. Nevertheless, the shortcomings are that it is time-consuming, requires availability of complete records, and relies on the professional judgment that could result in subjectivity.

Forensic investigation is the process of using specialized investigative techniques in order to detect fraud in commercial banks. It implies accumulating, scrutinizing and recording

data pertaining to financial dealings, employee conduct and business operations to determine the possibility of fraud (Kamau & Wanjiru 2023). This is a practice that combines the knowledge of accounting, auditing, and law to identify the source of anomalies and identify the involved parties. Detection is only part of forensic investigation and is followed to the construction of a solid case to be prosecuted or disciplined (Otieno, 2022).

Mosoti, Yatich (2021) highlighted that one of the most effective approaches to detecting complex fraud in commercial banks is the forensic investigation. It has been established that it does not just detect fraudulent activities but can also be used to present actionable intelligence to legal processes. Other researchers claim that forensic investigation serves as a deterrent because when employees and customers understand that they can be investigated in detail, they will be less inclined to commit fraud.

Mukama, (2022) point out its contribution towards regaining the stakeholders trust following significant fraud scandals. Nonetheless, scholars also make it clear that forensic research is costly, time-consuming and frequently constrained by bureaucracy in financial organizations. It has also been contended that inquiries can have reputational risks on banks, particularly where fraud is revealed in an open court of law.

According to Nduta& Mwangi, (2022) as a method, the forensic investigation enables the banks to unravel the fraud in a holistic manner by gathering tangible evidence and connecting it to particular individuals. It enhances fraud law suits and helps in regulatory compliance. But it has such weakness as long investigations, it is expensive, and there is a risk of staff resistance toward the investigation. Also, investigations are usually reactive, which is initiated once the fraud has already taken place, and therefore, they are less efficient in protecting financial losses prior to their occurrence.

Forensic accounting technology has played a pivotal role in enhancing the efficiency of fraud detection, and businesses have focused on the rate of technology use and system response time to guarantee that discrepancies and fraudulent transactions get detected quickly (Williams and Jones, 2022). Technology implementation cost has emerged as a major determinant to the viability of the application of forensic accounting approaches to an international scope. It focuses on efficiency and accuracy of forensic tools because it directly influences the level of fraud detection, overall rate of case resolved, and overall stakeholder satisfaction scores in businesses and government institutions as well.

Forensic accounting techniques have been on the rise in the regional environment especially in Africa due to the rising sophistication of financial offenses, especially in the corporate and government circles. More sophisticated forensic data analysis tools have become increasingly used in the region, judged by their effectiveness in detecting fraud and the quantity of investigative techniques they use (Chinua and Njoroge, 2022).

Financial integrity is also becoming an area where forensic accounting is employed to track and analyze and important indicators of its performance in terms of frequency of data audits and the rate of detecting errors are among some of the measures that institutions employ to determine the effectiveness of their internal controls. The perceived value of forensic accounting towards increasing transparency and accountability is also measured using the score of the stakeholder satisfaction. Technology has played a major part in this transition and technology usage in forensic investigations has been on an upward trend.

Forensic accounting methods are especially relevant in the case of Commercial Banks in Kenya as a way of protecting financial institutions against frauds and other financial offenses. Kenyan banks have also started to employ increasingly sophisticated forensic

accounting, which incorporates the accuracy improvement measurement of data, rates of the cases being resolved, and the average time of the case investigation (Mutiso and Okoth, 2023).

Banks evaluate the effectiveness of their fraud detection systems in terms of the effectiveness of their methods of forensic accounting investigation, the number of audits they run, and the technology they use to aid such initiatives. The use of these techniques is also quantified by the key performance indicators which include the number of investigative methods employed, effectiveness in detecting fraud and the degree of satisfaction of the stakeholder. Moreover, affordability of technology usage is one of the critical aspects that need to define sustainability of forensic accounting practices in the Kenya financial industry.

The impact of fraud on Kenya commercial banking sector integrity is serious and has led to too much loss of finances and loss of public trust. The complexity of the fraud cases is on the rise and this has rendered the old methods used in detecting fraud cases inefficient. Specific studies regarding forensic accounting are required, which has not been investigated in the research on commercial banks previously, which have examined other fields like insurance (Musyoka, 2023).

The research will fulfill the need for empirical evidence to show how forensic accounting techniques will improve internal controls and risk management, which will help mitigate fraud for banks; provide input for the Kenya Bankers Association; and allow for regulatory bodies, including the Central Bank of Kenya, to provide data for supervision. Furthermore, it will add to the academic literature and professional practice in forensic accounting, which is important to ensure that new fraud detection strategies can keep up with new financial challenges.

1.1.2 Fraud Detection

Globally, fraud detection has become a critical focus for financial institutions in countries such as the United States, the United Kingdom, India, and China, where significant fraud cases have been reported. For instance, the Wells Fargo fake accounts scandal in the U.S., the PNB scam in India, and high-profile financial crimes in China have highlighted vulnerabilities in commercial banks' operations. Fraud detection systems in these contexts are essential for early identification of fraudulent activities, helping minimize associated financial losses and reputational risks. By leveraging advanced technologies such as artificial intelligence and machine learning, banks can enhance their capacity to protect assets and foster secure financial ecosystems (Mwangi & Otieno, 2023).

In the African region, countries such as Nigeria, South Africa, and Kenya have witnessed fraud cases in commercial banks and other financial entities. For example, Nigerian banks have faced challenges such as cyber fraud and insider collusion, while South African banks have encountered phishing attacks and card fraud. Fraud detection systems in these countries play a pivotal role in safeguarding organizational assets and ensuring compliance with regulatory requirements. Moreover, they help maintain public trust and confidence, which are crucial for sustaining market share in an increasingly competitive financial landscape (Kimani, 2021).

Locally, in Kenya, commercial banks have reported significant fraud cases involving electronic banking fraud, ATM card skimming, and insider-related schemes. Kenyan banks, such as KCB and Equity Bank, have adopted fraud detection systems to enhance operational security and minimize losses. These systems use real-time monitoring and predictive analytics to identify potential fraudulent activities, providing timely feedback for preventive measures.

As fraud risks evolve, Kenyan banks continuously update their fraud detection frameworks to align with global best practices and emerging technologies, reinforcing their commitment to maintaining secure and trustworthy financial services (Wanjiku et al., 2022).

Fraud detection systems also incorporate performance metrics for ongoing evaluation. For example, precision measures how accurately fraud cases are detected, with true fraud detection serving as the basis for precision evaluation (Kimani, 2021). Recall, another important metric, evaluates how well the system detects fraud overall (Mwangi & Otieno, 2023). Advanced evaluation tools, such as the Receiver Operating Characteristic (ROC) curve and Area Under the Curve (AUC), assess a system's ability to distinguish between fraudulent and legitimate transactions (Kimani, 2021). In addition, precision-recall (PR) curves and Card Precision at Top-'k' (CP@k) metrics provide a focused analysis of fraud detection, offering deeper insights into the organization's operational effectiveness (Wanjiku et al., 2022).

1.1.3 Commercial Banks in Kenya

Fraud detection provides organizations with considerable advantages. It reduces financial leakage, since fraud can be detected and controlled early before it leads to severe financial losses (Mwangi & Otieno, 2023). When organizations have fraud detection systems, they can also secure revenues and use resources more efficiently. By reducing fraud, they also cut down on legal expenses and costs associated with penalties, thus improving financial performance and efficiency (Kimani, 2021).

The Statista report (2023) indicates there were 39 commercial banks in Kenya, of these banks, 20 were local private banks and 17 were foreign institutions with two other local banks being publicly owned as of 2024. This diversity illustrates the robustness of the Kenyan

financial sector, which has banks that are central to economic growth and development. Despite the positive news in having growth in the banking sector, there have been problems in the sector resulting in closures such as Chase Bank and Dubai Bank, due to operational reasons for which the Central Bank of Kenya (CBK) was involved. With regards to the representation of the banking sector, Kenya Bankers Association (KBA) is the representative body.

KBA advocates for the financial sector of Kenya and is the umbrella body for the institutions licensed and regulated by the CBK (39 institutions are members of KBA). KBA plays a key role in promoting a reputable and professional banking sector. KBA's advocacy role focuses on building trust by those Kenyans who place their money with these banks, hoping to protect their savings and meet their financial goals

In forensic accounting techniques research, there are some constructs that might lack clear capturing because of the contextual and methodological constraints. The missing constructs, such as technology advanced forensic tools, integration of legal expertise, and behavioral analysis of fraudsters, will be considered in this study with the help of triangulation with secondary sources and interviews with experts. This makes sure that the scope of forensic data analysis, forensic accounting and forensic investigation is not strictly outlined but rather a wholesome representation of the role of the forensic techniques in identifying fraud. Moreover, statistical controls will be used in data analysis to reduce bias that may occur as a result of missing variables and the instrument pilot testing will be used to refine the core construct measurements, which may otherwise miss relevant dimensions.

The reason behind the selection of the commercial banks as the setting of the study is because of their strategic positions in the financial system of Kenya and their susceptibility to fraud. Commercial banks deal with huge amounts of transactions per day, which are the main

areas of activities of fraud schemes like defaults in loans, identity thefts, insider collusion, and online fraud. According to the reports of the Central Bank of Kenya (CBK, 2023), the banking fraud is on the increase, and losses exceed billions of shillings per year. Through this context, there is a good opportunity to critically evaluate the efficiency of the methods of forensic accounting in detecting fraud. Moreover, commercial banks are highly regulated entities, and the findings will not only be important to the management but also to the regulators, policymakers, and auditors in enhancing the fraud prevention and detection controls.

1.2 Problem Statement

Fraud remains one of the most pressing challenges facing Kenya's banking sector, threatening financial stability, investor confidence, and customer trust. According to the Kenya Bankers Association (2022), commercial banks reported losses exceeding KES 1.5 billion in 2021, with cyber fraud alone accounting for 62% of all cases reported to the Central Bank of Kenya. High-profile cases such as the collapse of Imperial Bank in 2015 due to insider fraud involving KES 34 billion and the 2016 closure of Chase Bank over mismanagement of funds illustrate the magnitude of the problem and the gaps in existing fraud detection systems (CBK, 2024).

Previous studies have emphasized the role of forensic accounting in mitigating fraud. For instance, Owajori et al. (2008) found that forensic accounting reduces fraud detection barriers in corporate entities, while Amake and Ikhatua (2016) established its role in protecting public institutions from financial manipulations. In Kenya, Wanjohi (2011) noted that forensic accounting helps bridge the audit expectation gap, and Omondi (2013) demonstrated its relevance in detecting banking sector fraud. However, despite these insights, a critical gap

remains: little empirical evidence exists on how specific forensic accounting techniques are applied to fraud detection in Kenyan commercial banks.

Most existing research has focused on non-banking industries, such as insurance and public institutions (Amake & Ikhatua, 2016), thereby leaving the banking sector underexplored. Given the increasing sophistication of financial crimes in banking industry in Kenya, this study seeks to bridge this gap by examining the effect of forensic accounting techniques on fraud detection among commercial banks in Kenya. Previous studies concentrated on corporate entities and public institutions, with limited focus on commercial banks in Kenya.

Existing literature provides general insights on forensic accounting, but lacks evidence on specific forensic techniques (e.g., financial document verification, digital forensics, data mining). There is no consensus on the extent to which forensic accounting improves fraud detection in commercial banks, creating a gap in both academic literature and practice.

1.3 Objectives of the Study

1.3.1 General objective

The general objective of the study was to evaluate the effect of forensic accounting techniques on fraud detection among commercial banks in Kenya

1.3.2 Specific objectives

The study was guided by the following specific objectives.

i. To determine the effect of forensic data analysis on fraud detection among commercial banks in Kenya

ii. To assess the effect of financial document verification on fraud detection among commercial banks in Kenya

iii. To determine the effect of forensic investigation on fraud detection among commercial banks in Kenya

1.4 Research Hypothesis

Now test this hypothesis

H_o1 Forensic data analysis has no significant effect on fraud detection among commercial banks in Kenya

H_o2 Financial document verification has no significant effect on fraud detection among commercial banks in Kenya

H_o3 Forensic investigation has no significant effect on fraud detection among commercial banks in Kenya

1.5 Justification of the study

The need for this research on the effect of forensic accounting techniques on fraud detection among commercial banks in Kenya arises from the increasing prevalence of fraud, which poses significant financial and reputational risks to the banking sector. Despite advancements in technology, Kenyan banks continue to experience high-profile fraud cases, such as the collapse of Imperial Bank and Chase Bank, highlighting gaps in current fraud prevention measures. This study addressed these gaps by evaluating the effectiveness of forensic accounting techniques, providing actionable insights for enhancing risk management and internal controls. The findings will benefit stakeholders, including banks, regulators, and forensic accounting professionals, by offering innovative solutions to

strengthen fraud detection systems, improve financial stability, and uphold public trust in banking sector.

1.6 Significance of the Study

1. 6.1Commercial Banks in Kenya

The study provides targeted forensic accounting procedures that enhance risk management and internal control systems. By implementing these insights, banks can significantly reduce fraud occurrences, improve financial stability, and strengthen their market positions. These benefits contribute to better customer trust and operational efficiency, securing their competitive edge in the industry.

1.6.2. Kenya Bankers Association (KBA)

The Kenya Bankers Association can gain precise standards for detecting financial fraud. The study offers valuable data that helps KBA establish industry-wide preferred methods for fraud prevention. This enables the association to defend its members against inadequate fraud prevention measures, elevating the overall integrity and reliability of the banking sector.

1.6.3. Central Bank of Kenya (CBK)

The Central Bank of Kenya can benefit from the study's findings in formulating new regulatory policies and supervisory frameworks. By incorporating these insights, the CBK can reinforce its mission of financial stability, enhance public trust, and establish stronger compliance guidelines. Creative anti-fraud measures derived from the study also support CBK’s oversight functions.

1.6.4. Forensic Accounting Professionals

The study contributes to the field of forensic accounting by presenting practical solutions and theoretical advancements. These developments provide professionals with enhanced tools and techniques to detect and prevent fraud, thus improving their effectiveness and competence in the field.

1.6.5. Educational Institutions

The study equips academic institutions with modernized teaching materials that reflect current practices in forensic accounting and fraud detection. These insights enrich professional development programs and curriculum designs, ensuring that future accountants are well prepared to tackle fraud-related challenges in the banking sector and beyond.

1.7 Scope of the Study

The research focused on evaluating the influence of forensic accounting techniques on detecting fraud incidents among commercial banks in Kenya. The analysis evaluated which forensic accounting methods best-supported fraud identification within Kenyan banking institutions. The scope of the study targeted the 43 registered commercial banks within Nairobi County. The researchers conducted the study between August 2025 and October 2025.

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CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This part is about a review of theory, the empirical analysis, gaps in the research, the conceptual framework, and how to use variables to find fraud using forensic accounting procedures.

2.2 Theoretical Review

A theoretical review critically examines relevant theories to establish a foundation for the study, guiding the research framework and analysis. This study is anchored on three key theories: Routine Activity Theory, Rational Choice Theory, and Fraud Triangle Theory.

2.2.1 Routine Activity Theory

This theory was formulated in 1979 by Felson Marcus and Cohen Lawrence. The theory asserts that criminal acts are a result of convenience, and therefore individuals would engage in white-collar offenses in their workplace due to the easily accessible opportunities. The concept of routine activity theory suggests that individuals become susceptible to committing unlawful activities based on their circumstances and the fact that they have the means to carry out such acts.

Since its development by Cohen and Felson (1979), Routine Activity Theory has been widely applied to explain financial fraud and white-collar crime in organizational contexts. Studies on occupational fraud in banks and other financial institutions have employed the theory to demonstrate how opportunity, motivated offenders, and absence of effective guardianship contribute to fraudulent activities (Ngugi & Mwangi, 2021). It has also been applied to cyber fraud detection, illustrating how technological vulnerabilities create new

opportunities for crime. However, critics argue that the theory oversimplifies human behavior by focusing primarily on situational factors while ignoring psychological, cultural, and ethical dimensions of crime. Others contend that it underestimates organizational structures, such as weak governance or leadership failures, that enable fraud beyond mere opportunity.

Routine Activity Theory rests on three core assumptions. Crime occurs when there is a motivated offender, meaning an individual willing to engage in fraudulent acts. There must be a suitable target, such as financial records, digital systems, or cash reserves within a bank that are vulnerable to manipulation. The absence of capable guardianship such as auditors, internal controls, or regulatory oversight creates an environment conducive to fraud. The theory also assumes that offenders act rationally and weigh the benefits against the risks before committing a crime. Additionally, it presumes that changes in daily routines, such as increased digitization in banking, can alter the availability of opportunities for crime, making fraud prevention dependent on effective monitoring mechanisms (Engestrom, 2000).

Despite its usefulness, Routine Activity Theory has several limitations. It places heavy emphasis on opportunity and environmental conditions but pays limited attention to individual motivations, such as greed, personal ethics, or financial pressure, which often drive fraud. The theory also overlooks broader institutional and cultural factors, such as weak corporate governance, poor regulatory enforcement, or workplace cultures that tolerate unethical practices. In banking contexts, it may not fully explain complex fraud schemes that involve collusion among employees, management, or even external actors. Furthermore, critics argue that the theory is more reactive than proactive, focusing on why crimes occur rather than offering comprehensive frameworks for preventing them. Thus, while insightful, it must be complemented by other criminological theories (Stetsenko, 2020).

Hillision & Pacini (2004) indicated in their model that one of the factors contributing to fraudulent financial statements is "the extent to which conditions facilitate the perpetration of management fraud." To combat crime, organizations can ensure they minimize loopholes that provide convenience for employees to engage in fraudulent activities. This could entail putting policies in place like surprise inspections, work rotation, and duty separation, among others. The presence of potential targets, such as people or organisations; the lack of appropriate guardians, such as security guards, auditors, and risk personnel; and the availability of capable offenders, such as disgruntled or financially distressed employees, are the three main factors that influence crime, according to this theory.

The increasing incidence of fraud within organizations has drawn attention to fraud detection and prevention, and many people agree that such frauds could have been prevented if organizations had implemented effective internal controls. (Nyakarimi & Karwirwa, 2015) suggested that strong internal controls can help organizations avoid fraud by eliminating environments that facilitate easy access to commit fraudulent acts. Fraud prevention involves fostering a culture of honesty and high ethical standards while eliminating potential opportunities for fraud (Zimbleman and Albrecht 2012).

Routine activity theory is linked to explain the first objective determine the effect of forensic accounting data analysis techniques on fraud detection in Commercial Banks in Kenya. This is because forensic accountants play a crucial role as capable guardians who does not only prevent fraud but also detect it when it occurs and assist in prosecuting the offenders.

2.2.2 Rational Choice Theory

The theory was established in 1964 by Cesare Beccaria, who described white-collar crime as a process of weighing options and determining which choice offers the most favorable

rewards. Beccaria argued that the severity of punishment for a specific crime directly influences its control. He suggested that individuals are driven to commit crimes when the benefits of those crimes outweigh the associated costs. The rationale behind this theory is rooted in the principle of "utilitarianism," which posits that people are rational decision-makers who assess potential outcomes before taking action and seek to avoid negative consequences. Criminal activities become more enticing if the perceived benefits outweigh the losses or consequences (Herfeld, 2020).

Rational Choice Theory, developed in the late 20th century by Cornish and Clarke (1986), has been widely applied in studies of fraud, especially in financial institutions. Research in commercial banks has demonstrated how employees weigh the perceived benefits of committing fraud against the potential risks of detection and punishment (Omondi & Kihara, 2020). The theory has also been used in cybercrime studies, highlighting how offenders make calculated decisions based on technological loopholes. Critics, however, argue that the theory exaggerates the rationality of human decision-making. Not all fraudulent actions are premeditated; some are impulsive or driven by emotions, desperation, or peer influence. Moreover, critics contend that the theory neglects the influence of organizational culture and systemic weaknesses in enabling fraud (Rutar, 2019).

Rational Choice Theory is based on the assumption that individuals are rational actors who make decisions after carefully evaluating costs and benefits. It assumes that fraudsters in banks deliberately consider factors such as the likelihood of detection, severity of punishment, and potential financial gain before committing fraud. Another assumption is that opportunities for fraud are not randomly exploited but are chosen strategically by individuals who perceive weaknesses in controls, such as weak auditing systems or poor supervision. The theory also

assumes that crime is a purposeful act intended to satisfy the offender's personal or financial needs. Finally, it presumes that reducing opportunities and increasing the risks of detection can discourage rational actors from engaging in fraudulent behavior (Rutar, 2019).

Although Rational Choice Theory provides a clear framework for understanding fraud, it has notable limitations. It oversimplifies decision-making by assuming all offenders act rationally, while in reality, emotions, pressure, and psychological factors often drive fraud. It underestimates structural issues such as systemic corruption, poor regulatory environments, and weak institutional frameworks that create enabling conditions for fraud in banks. It neglects social and cultural influences, such as workplace pressure, group norms, or peer influence, which may push individuals into fraudulent practices regardless of rational evaluation. Additionally, the theory is more focused on individual behavior than organizational dynamics, limiting its application in explaining complex fraud schemes involving collusion or institutional failure (Radovanović, 2019).

When organizations take swift and severe actions against crime, the likelihood of deterring criminal behavior increases. Therefore, punitive measures implemented by organizations against fraud perpetrators can serve as a preventive measure. Organizations achieve fraud deterrence by instilling fear of the consequences, which should be effectively communicated (Kimani, 2011). The prosecution of fraud perpetrators serves three main objectives: disciplining the offender as a means to prevent future crimes, establishing a strong tone at the top that unethical behavior will not be tolerated, and recovering stolen assets whenever feasible (Albrecht et al., 2009).

Rational choice theory is connected to the second objective, which examines the effect of financial document verification on fraud detection in Commercial Banks in Kenya. This is

because when formulating fraud prevention policies, the dedication and commitment of senior managers and the board to punish criminal behavior form the foundation of an effective fraud prevention program.

2.2.3 Fraud Triangle Theory

This theory, proposed by Donald Cressey in 1971. The theory states that that three elements (Pressure, Opportunity, and Rationalization) must be present for a white-collar crime to occur. In his research on fraud, Cressey aimed to understand why people engage in fraudulent behavior and focused on the violation of trust. According to him, every action has a motive behind it. Pressure refers to factors that influence or compel individuals to engage in unethical behavior. All fraud perpetrators face some form of pressure that drives them to commit fraudulent acts (Mansor & Abdullahi, 2015). Lister (2007) emphasized pressure as a crucial element in fraud perpetration, categorizing it into three types: employment stress, external pressure, and personal pressure.

Fraud Triangle Theory has been widely used in studies on occupational fraud within banks and financial institutions. Researchers argue that the framework effectively explains how employee pressure, access to opportunities, and rationalization lead to internal fraud such as embezzlement or loan manipulation (Wachira & Muturi, 2020). The theory has also been applied in forensic accounting research, helping auditors identify fraud risk factors during investigations. However, critics argue that it is too simplistic for modern banking fraud, which often involves collusion, cybercrime, and complex schemes beyond individual motives. Wolfe and Hermanson (2004) introduced the "Fraud Diamond" model, adding "capability" as a fourth element, while others have developed the "Fraud Pentagon" to include arrogance and competence, highlighting the theory's evolving limitations

The Fraud Triangle Theory assumes that fraudulent behavior arises when pressure, opportunity, and rationalization intersect. It presumes that individuals under financial or social pressure are more likely to consider fraud. Another assumption is that organizational weaknesses such as ineffective audits, lack of segregation of duties, or poor regulatory oversight create opportunities that encourage fraud. The theory further assumes that people require a form of rationalization to justify fraudulent acts to themselves, suggesting that ethical boundaries are flexible under certain conditions. It also presumes that fraud is a deliberate and calculated act rather than impulsive, reinforcing the idea of rational decision-making. Finally, it assumes that strengthening internal controls and reducing opportunities can significantly minimize the risk of fraud in institutions (Kagias, et,al 2022).

Mandal (2024) posits that while influential, the Fraud Triangle Theory has notable limitations. It tends to focus heavily on individual behavior and ignores broader organizational or cultural factors that may contribute to fraud. For example, systemic corruption, collusion among employees, and technological vulnerabilities are not adequately explained by the three elements. Critics argue that it overlooks the role of capability or power, which allows certain individuals to override controls or exploit systemic weaknesses. In modern banking, fraud often involves complex schemes, insider collaboration, and cyber-enabled crime that cannot be fully explained by pressure, opportunity, and rationalization alone. Furthermore, it assumes that rationalization is always present, yet some fraudsters act without moral justification. Hence, the model is useful but incomplete for contemporary fraud detection.

Opportunity is another critical factor required for fraud to take place. Opportunities arise when an organization's internal controls or governance systems are ineffective, enabling individuals to carry out fraud. Hartley and Kelly (2010) argued that individuals exploit

loopholes or weaknesses in controls to commit fraud. Cressey (1953) found that when the risk of getting caught is low, the likelihood of fraud increases. Opportunities for fraud within organizations can arise due to various factors; including failure adhere to policies, employee negligence, and lack of disciplinary actions (Sauser, 2007). Wilson (2004) defined "opportunity" as the ability to bypass controls implemented to prevent fraud.

Rationalization occurs when fraud perpetrators develop morally acceptable justifications for their unethical behavior. If an individual cannot rationalize their immoral actions, they are less likely to engage in fraud. Some of the rationalizations examples include statements like "I was only borrowing the money with the intention to repay." Detecting rationalization is challenging due to the difficulty of understanding the fraudster's mindset. Fraudsters typically possess a mindset that allows them to vindicate their criminal behavior (Hooper & Pornelli, 2010).

This theory is therefore linked to the third objective, which examines the effect of forensic accounting investigation techniques on fraud detection in Commercial Banks in Kenya

2.3 Empirical review

An empirical review involves the examination of previous studies to analyze existing findings, methodologies, and gaps related to the research topic. This section reviews prior research on three key areas: forensic accounting data analysis techniques, forensic accounting technology, and fraud detection.

2.3.1 Forensic data analysis and fraud detection

Ali and Rehman (2021) examined the impact of forensic accounting data analysis techniques on fraud detection in the banking sector of Pakistan. Using the Fraud Triangle Theory as a framework, the study collected primary data through structured questionnaires

distributed to bank employees. The findings revealed that advanced data analysis techniques, including predictive modeling and statistical analysis, significantly improved fraud detection rates in the banking sector. The study highlighted the need for integrating these techniques into operational frameworks to mitigate fraud risks. The current study addressed a research gap addressed data analysis gap on fraud detection in commercial banks in Kenya.

Moses (2020) evaluated the use of forensic accounting techniques in preventing and detecting fraudulent practices in Nigerian commercial banks. Employing descriptive statistics and the Ordinary Least Squares (OLS) model, the study utilized data collected through structured questionnaires administered to banking professionals. The results indicated that techniques such as data mining, ratio analysis, and trend analysis significantly enhanced fraud prevention and detection. However, the study also revealed a lack of technical capacity among staff to utilize these techniques effectively, recommending enhanced training and robust software acquisition. The current study address research gap by examining the effect of forensic accounting data analysis techniques on fraud detection in commercial banks in Kenya.

Tompson et al. (2015) investigated forensic accounting data analysis in the UK by comparing Police.uk data with police-recorded data for a large metropolitan police force. The study quantified spatial accuracy across four geographic levels and five crime types. Systematic errors were tested using statistical methods, including maximum likelihood approaches. A "best-fit" statistical model was developed to explain these errors and propose corrections. The study highlighted the importance of accurate data analysis techniques in forensic accounting for improving crime detection. The current study addressed a research gap by examining the effect of forensic accounting data analysis techniques on fraud detection in commercial banks in Kenya.

Rezaee and Wang (2019) explored the relevance of Big Data to forensic accounting practice and education by surveying academics and practitioners in China. The study assessed the demand, importance, and content of Big Data skills and topics required for forensic accounting education to address challenges and opportunities in the era of Big Data. The findings revealed a growing demand for integrating Big Data and data analytics into forensic accounting, emphasizing the need to include these topics in the business curriculum. Additionally, several Big Data attributes and techniques were identified as essential for enhancing forensic accounting education and practice. The current study addressed a research gap by examining the effect of forensic accounting data analysis techniques on fraud detection in commercial banks in Kenya.

Mkhize and Moyo (2019) explored the role of forensic accounting data analysis techniques in fraud detection within South African insurance firms. Guided by the Rational Choice Theory, the study collected data through interviews and secondary sources from fraud investigation units. The findings underscored the importance of leveraging technologies like machine learning and blockchain to detect fraudulent claims, emphasizing their role in improving efficiency and reducing financial losses in the industry. The current study addressed a research gap by examining the effect of forensic accounting data analysis techniques on fraud detection in commercial banks in Kenya.

Nduta and Mwangi (2022) analyzed the impact of forensic accounting data analysis techniques on financial fraud detection in Nairobi County. Using the Fraud Diamond Theory, data were gathered from auditors and accountants in various sectors through structured interviews and surveys. The study found that techniques such as Benford's Law and ratio analysis were highly effective in identifying anomalies, but implementation challenges,

including resource limitations, hindered widespread adoption. The current study seeks to address a research gap by examining the effect of forensic accounting data analysis techniques on fraud detection in commercial banks in Kenya.

Otieno and Kamau (2023) examined the effect of forensic accounting data analysis techniques on fraud detection among commercial banks in Kenya. The study, grounded in the Modern Portfolio Theory, employed a descriptive research design and collected data through online questionnaires from banking sector employees. The findings revealed that techniques such as trend analysis, artificial intelligence, and statistical modeling significantly improved fraud detection. However, the study identified a gap in the integration of these techniques into existing fraud detection frameworks, highlighting the need for tailored training programs and policy support. The current study addressed a research gap by examining the effect of forensic accounting data analysis techniques on fraud detection among commercial banks in Kenya.

2.3.2 Financial Document Verification and fraud detection

Baechler et al. (2024) investigated forensic intelligence as an emerging approach in forensic document examination. The study noted that forensic science has long struggled with limitations in addressing document fraud, a concern initially identified by Kirk in 1963 and reaffirmed by later scholars. Unlike traditional methods focused on source or activity identification, forensic intelligence emphasizes identifying criminal trends to support prevention and proactive disruption of fraud. The review highlighted the evolution of systematic forensic intelligence methods applied to fraudulent identity documents, which have already been tested across Europe, Canada, and Australia. The findings demonstrated its potential to extend to handwriting analysis and both physical and digital document examinations. However, the study was limited to a review of English and French publications,

leaving gaps in application within African contexts, including Kenya's commercial banking sector.

Gupta and Kumar (2020) conducted a study in India titled Forensic Document Examination System Using Boosting and Bagging Methodologies. The research adopted an experimental methodology, applying machine learning techniques such as K-NN, decision tree, random forest, and adaptive boosting to classify forged documents. Although not based on social theories, the study was anchored on computational forensic science and pattern recognition models. Their findings revealed that the proposed document classifier achieved an impressive accuracy rate of 95.1% by combining KPNF, ORB, and SURF features with a random forest classifier and adaptive boosting. The study recommended wider application of passive forensic approaches and advanced machine learning in financial and government institutions, with larger datasets for validation. However, the study filled a gap as it did not contextualize forensic accounting techniques within commercial banks, particularly in Kenya.

Wambugu (2024) investigated the impact of forensic document examination skills on land fraud investigations at the Directorate of Criminal Investigations (DCI) headquarters in Nairobi City County, Kenya. The research was informed by the fraud triangle theory and routine activity theory, using a case study methodology. The researchers utilised purposive sampling to find responders and simple random sampling to choose participation. These two groups made up 64% of the target population. Data were gathered using questionnaires and interview schedules, thereafter analysed using descriptive statistics, thematic analysis, and the triangulation of qualitative and quantitative results. The research indicated that magnifiers, microscopes, comparative instruments, ultraviolet (UV) and infrared (IR) bulbs, and electrostatic detecting devices were the most frequently used tools. The findings also

demonstrated that forensic document inspection made investigations more credible, sped up land fraud investigations, and affected how much money was spent on forensic equipment. But there were problems like corruption, not enough tools, not enough money, changing technology, and different interpretations. The report suggested more money, giving examiners credentials, greater training, and better working conditions to make it easier to find document fraud.

Khator (2020) examined the effect of forensic document examination knowledge on travel document fraud detection at Jomo Kenyatta International Airport (JKIA). The study adopted a case study design and randomly sampled 68 immigration officers out of 200. Data were collected using close-ended questionnaires and analyzed quantitatively with computer software. Findings revealed that all officers had at least undergraduate degrees and basic document examination training, which significantly enhanced fraud detection. Key factors influencing detection included work experience, training, literacy in travel documents, and the use of updated manuals. Forgeries and counterfeits were the most common frauds, with profiling identified as the most effective detection technique. The study concluded that forensic document examination positively impacts border management and recommended mandatory training before deployment, provision of up-to-date manuals, and regular in-house trainings.

Okpako and Atube (2013) investigated how emerging technologies on financial document verification can enhance forensic accounting practices in Nigeria. The study focused on evaluating the efficiency of new forensic accounting technologies in improving fraud detection and comparing their effectiveness with traditional methods. A comprehensive methodology was employed, utilizing techniques like regression analysis, Beneish M-Score, and Benford's Law to analyze data from 100 companies. Additionally, the impact of blockchain

on transparency and fraud detection was assessed using data from 50 companies. The findings indicated that data analytics (β=0.35) and AI (β=0.30) significantly enhanced fraud detection effectiveness. Companies with high transaction volumes that employed blockchain technology demonstrated greater transparency and traceability, which further improved fraud detection outcomes. The current study addressed an empirical gap by examining financial document verification and its role in fraud detection in commercial banks in Kenya.

Cruz et al. (2020) explored the effectiveness of forensic accounting technology in fraud detection within manufacturing firms in Mexico, using the Agency Theory as the theoretical framework. The study employed secondary data from financial records, audits, and annual reports, alongside a content analysis approach. The findings indicated that technologies such as AI-driven data analysis and blockchain enhanced fraud detection by improving transparency and reducing information asymmetry. The study emphasized that firms adopting these technologies experienced a significant decrease in fraudulent activities. The current study addressed a research gap by examining financial document verification and its role in fraud detection in commercial banks in Kenya.

Sharma and Gupta (2021) investigated the role of forensic accounting technology in detecting fraud within India's retail banking sector, using the Technological Determinism Theory. The study utilized secondary data collected from bank financial reports, fraud detection records, and case studies. The results revealed that the implementation of data analytics and anomaly detection software played a crucial role in identifying fraudulent transactions in real time. Despite these advances, the study identified challenges related to the high cost of technology implementation and insufficient training. The current study seeks to

addressed a research gap by examining financial document verification and its role in fraud detection in commercial banks in Kenya.

Mwenda and Nchimbi (2019) examined the application of financial document verification in fraud prevention within Tanzania's public sector, using the Fraud Prevention Theory. Secondary data was collected through government financial records, audit reports, and previous fraud detection case studies. The findings demonstrated that forensic accounting technologies, such as data mining and digital forensics tools, led to a significant reduction in fraud. However, challenges like limited access to advanced technologies and the reluctance to adopt new systems were also noted. This study addressed a research gap by examining financial document verification and its role in fraud detection in commercial banks in Kenya.

Wachira and Otieno (2022) analyzed the impact of financial document verification on fraud detection in microfinance institutions (MFIs) in Kenya, using the Resource-Based View (RBV) Theory. Secondary data was gathered from financial statements, fraud reports, and existing research publications. The study revealed that the use of predictive analytics and digital forensics tools greatly enhanced fraud detection in MFIs, showing a significant improvement in identifying financial irregularities. However, the study highlighted the shortage of trained personnel and resources as key barriers to effective implementation. The current study addressed a research gap by examining financial document verification and its role in fraud detection in commercial banks in Kenya.

Mosoti, & Yatich, (2021) evaluated the effect of financial document verification into Forensic accounting on the detection of Fraud in the financial sector in Kenya. The study is anchored on Unified Technology Acceptance and Use Theory **(**UTAUT) and uses panel data collected on the number of cybersecurity advisories, the reported number of cyberattacks, and

the percentage of fraud detections by four Forensic Accounting Techniques. The study findings showed that there was a strong positive correlation between cyber security and fraud detection and integration of cyber security and forensic accounting enhanced fraud detection. The study concluded that the integration of cybersecurity and forensic accounting enhanced fraud detection and contributed positively to financial performance. The current study addressed a research gap by examining financial document verification and its role in fraud detection in commercial banks in Kenya.

Mukama (2022) developed a digital financial document verification framework for fraud investigation and prevention in mobile financial services in Uganda. The study was grounded in the Fraud Management Framework and utilized a design science approach to develop and evaluate the performance of artifacts. Data collection methods included observations, interviews, sound recording, and note-taking, with analysis conducted using NVivo software for qualitative data and SPSS for quantitative data. Techniques such as data mining and machine learning were integrated into the framework. The findings indicated that the proposed framework effectively identified critical steps and information for fraud detection and prevention, demonstrating its potential for practical implementation. The current study addressed a research gap by examining financial document verification and its role in fraud detection in commercial banks in Kenya.

2.3.3 Forensic investigation and fraud detection

Kaur, Sood, and Grima (2023) sought to ascertain the role of forensic accounting investigations in the identification and prevention of fraud. The authors adopted the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) approach to perform a systematic literature review (SLR), reviewing current research on forensic accounting. The

data demonstrated a favourable association between forensic accounting and fraud identification and prevention. They underlined that fraud, being complicated, needs an in-depth grasp of investigative procedures to successfully counteract it. However, the research revealed obstacles in using forensic accounting procedures, notably in terms of its complexity and the shifting form of fraud schemes. The present study addressed these research gaps by investigating forensic accounting investigation procedures in commercial banks in Kenya.

Taylor (2021) conducted a study on the effectiveness of forensic accounting investigation in detecting fraud in financial institutions in the United States of America. Grounded in the Fraud Triangle Theory, the study employed a descriptive research design and utilized structured interviews along with secondary financial data for data collection. Their findings revealed that techniques such as forensic document examination, lifestyle audits, and digital forensics significantly enhanced fraud detection, particularly in uncovering embezzlement schemes. The research also did not address the evolving nature of fraud in a rapidly digitizing financial landscape. The current study addressed these research gaps by examining forensic accounting investigation techniques specifically in commercial banks in Kenya.

Fiia (2013) examined the role of forensic accounting investigation in curbing crime and corruption in the public sector, focusing on selected ministries in Kogi State. The study aimed to explore how forensic accounting can contribute to fighting corruption through investigative skills, litigation support services, and documentation and reporting. The research design employed was a survey, with primary data collected from the Federal Inland Revenue Service (FIRS). The findings revealed that forensic accountants are crucial in investigating crime and corruption, as well as providing support in litigation and maintaining proper documentation in

the public sector. The current study addressed these research gaps by examining forensic accounting investigation techniques specifically in commercial banks in Kenya, aiming to apply these techniques in the banking sector.

Ivanov and Petrov (2020) examined the application of forensic accounting in preventing financial fraud in Russia. Using Rational Choice Theory, the study adopted a case study research design and collected data through archival records and expert interviews. The findings indicated that techniques like digital forensic analysis and transaction pattern analysis were critical in uncovering complex financial fraud within corporate organizations. Despite the valuable insights, the study primarily concentrated on large corporate entities and did not explore the potential challenges and limitations in smaller financial institutions, such as banks in emerging markets. Additionally, the application of modern forensic accounting technologies like machine learning and blockchain was not considered. The current study addressed the gaps by investigating how forensic accounting techniques can be applied to fraud detection in Kenyan commercial banks.

Mensah and Ofori (2019) investigated forensic accounting investigative techniques in combating fraud in Ghana's banking sector. Anchored in the Agency Theory, the study used a cross-sectional research design and gathered data through surveys and document analysis. The findings showed that forensic audits and fraud risk assessments played a significant role in detecting insider trading and other fraudulent activities within banks. However, the study did not explore the practical implementation challenges faced by forensic accountants in the local context or how these techniques could be integrated with automated systems and advanced technologies. The research was also limited to large commercial banks, leaving a gap in understanding the applicability of forensic accounting in smaller or rural banks. This study

filled this gap by examining how forensic accounting techniques are applied in commercial banks in Kenya, with a particular emphasis on small banks and the integration of technology-driven solutions for enhanced fraud detection.

Mohamed and Ali (2023) explored the role of forensic accounting investigation techniques in fraud detection in commercial banks in Somalia. Using Fraud Diamond Theory, the study employed a mixed-methods research design, gathering data from surveys and case study reviews. The findings indicated that cash flow analysis and forensic data analytics were effective in detecting fraudulent activities such as money laundering and misappropriation of funds. The current study filled these gaps by examining how forensic accounting investigation techniques can be effectively applied in commercial banks in Kenya, with a particular focus on overcoming infrastructure challenges and leveraging regulatory support to enhance fraud detection.

Karanja and Omondi (2022) assessed the application of forensic accounting investigation in fraud detection within exchange bureaus in Kenya. Anchored in the Contingency Theory, the study adopted a descriptive research design and collected data through surveys and financial records. The findings revealed that forensic auditing, currency tracking, and anomaly detection were effective in identifying fraudulent transactions. The study focused primarily on exchange bureaus, which are a subset of the financial sector, and did not consider how forensic accounting techniques could be applied to a broader spectrum of financial institutions, such as commercial banks. The current study addressed this research gap by examining how forensic accounting investigation techniques are applied in Kenyan commercial banks.

Adejumo and Ogburie (2025) explored trends and challenges in forensic accounting, emphasizing its role in preventing financial crimes in developing countries. They highlighted advancements such as big data analytics, AI-driven tools, and blockchain technology to detect fraud. However, they identified persistent challenges, including the complexity of financial fraud, cross-border transactions, and the need for continuous skill upgrades. Legal inconsistencies and the use of emerging technologies by fraudsters also complicate detection. To address these issues, forensic accountants must enhance their analytical skills, integrate new technologies, and collaborate with cybersecurity experts. The study calls for stricter regulations to combat fraud effectively. This study filled gap by examining forensic accounting techniques in Kenyan commercial banks.

2.3.4 Fraud detection in commercial banks

Yuniati and Banjarnahor (2021) conducted a study on the determinants affecting the fraud detection capabilities of external auditors in Jakarta. The research aimed to provide empirical evidence on factors such as auditor tenure, fraud detection experience, level of education, fraud training, and professional skepticism. The study employed a hypothesis-testing research design, with data collected from 120 auditors across seven public accounting firms in Jakarta using structured questionnaires. The data collection process occurred in April 2015, involving visits to the participating firms. Primary data was utilized, captured as a cross-sectional dataset. The study concluded that auditor tenure and fraud training did not significantly influence fraud detection capabilities. However, fraud detection experience, education level, and professional skepticism positively impacted auditors' ability to detect fraud. The study expanded on these findings by examining fraud detection techniques among commercial banks in Kenya, focusing on the role of forensic accounting investigations.

Huang, Lin, and Yen (2017) explored fraud detection using the fraud triangle framework. The study employed expert questionnaires to identify relevant fraud risk factors, followed by the application of Lawshe's approach to refine the factors, resulting in 32 measurements deemed suitable for assessing fraud detection. The Analytic Hierarchy Process (AHP) was applied to determine the relative weights of these factors. The findings revealed that "Pressure/Incentive" was the most critical dimension for fraud detection, while "Attitude/Rationalization" was the least significant. The top five critical measurements were "Poor performance," "The need for external financing," "Financial distress," "Insufficient board oversight," and "Competition or market saturation." These insights provide auditors and managers with actionable strategies to enhance fraud detection and evaluation. The current study built on this framework by investigating fraud detection in commercial banks in Kenya, specifically through the application of forensic accounting investigation techniques.

Koskei (2019) examined factors influencing the type and occurrence of fraud in deposit-taking SACCOs in Kenya. A response rate of 63% was achieved, with 111 questionnaires collected for analysis. The study employed descriptive statistics, factor analysis, independent T-tests, and multiple linear regression. Factor analysis revealed that all three factors pressure, opportunity, and rationalization were significant and retained for further analysis. Regression results indicated that opportunity and rationalization had a statistically significant influence on fraud occurrence, while pressure did not. Correlation analysis showed a positive relationship between all fraud-related factors and fraud occurrence, with opportunity and rationalization exhibiting stronger positive relationships than pressure. The current study seeks to build on these findings by focusing on fraud detection techniques in commercial banks in Kenya, emphasizing the application of forensic accounting investigation methods.

2.4 Critique of the Literature Review

The aforementioned empirical studies have examined and provided valuable insights into the relationship between forensic accounting and fraud detection across diverse contexts. However, several limitations persist, particularly in translating these insights into industry-specific applications, such as within commercial banks. Yuniati and Banjarnahor (2021) identified key factors influencing external auditors' capabilities in fraud detection, such as professional skepticism, education levels, and fraud detection experience. However, their study was geographically confined to Jakarta and excluded industry-specific applications. Furthermore, their dataset from 2015 may not adequately capture evolving trends, particularly given advancements in forensic accounting practices and the increasing complexity of financial fraud schemes in banking. This underscores the need for more recent and context-specific research to enhance fraud detection capabilities in commercial banks.

Huang, Lin, and Yen (2017) contributed significantly to fraud detection research by prioritizing risk factors through the fraud triangle framework, identifying "Pressure/Incentive" as the most critical dimension. Their methodological rigor, including the use of Lawshe's approach and the Analytic Hierarchy Process (AHP), offers a solid foundation for assessing fraud risk. However, their study falls short in providing actionable strategies for implementing these findings in complex industries like banking. For example, commercial banks face unique challenges such as cyber-enabled financial crimes and regulatory compliance issues, which were not addressed in their general framework. This limitation highlights the need for studies that integrate theoretical insights with practical forensic accounting tools to improve fraud detection efficacy in banking environments.

Koskei (2019) investigated the factors influencing fraud occurrence in Kenyan SACCOs, emphasizing the role of opportunity and rationalization as significant determinants. While this study provides a useful perspective on fraud causation, it does not sufficiently address fraud detection mechanisms, which are crucial for preventing fraudulent activities in financial institutions. Additionally, the findings are contextually limited to SACCOs, which differ from commercial banks in scale, operations, and regulatory environments. This contextual gap necessitates research that focuses on commercial banks, particularly in Kenya, to understand how forensic accounting techniques can be tailored to detect and mitigate complex fraud schemes specific to this sector.

Sule, Ibrahim, and Sani (2019) emphasized the importance of forensic accounting in fraud detection in Nigeria, advocating for its wider adoption and specialization among professional accountants. However, their reliance on secondary data without empirical validation weakens the practical applicability of their findings. Additionally, their generalized recommendations for enhancing forensic accounting practices lack specificity and fail to address the unique challenges faced by commercial banks, such as handling cross-border transactions and sophisticated financial instruments. This shortcoming calls for a more detailed and empirically grounded investigation into how forensic accounting techniques can be effectively deployed in banking institutions, especially in regions like Kenya, where regulatory and operational contexts differ.

While the reviewed studies provide foundational knowledge on forensic accounting and fraud detection, they reveal significant gaps in context-specific applications, empirical validation, and practical guidance for industries like banking. These gaps limit the utility of existing research in addressing the unique challenges posed by fraud in commercial banks. The

current study aims to bridge these gaps by empirically examining the application of forensic accounting investigation techniques in detecting fraud within Kenya's commercial banking sector. This research will contribute actionable insights tailored to the industry's unique requirements, enhancing fraud detection and prevention efforts.

2.6 Research gap

Research on forensic accounting techniques highlights several gaps that the current study seeks to address. Oyedokun (2022) identified a gap by examining the effect of forensic accounting techniques and theories without contextualizing them to the Kenyan banking sector. Similarly, Akinbowale and Zerihun (2020) investigated innovative approaches for combating economic crime and emphasized adaptability, but their work did not address Kenya's unique challenges. Okpako and Atube (2013) concentrated on emerging technologies such as AI and blockchain while overlooking traditional forensic techniques. Devlin and Baechler (2024) explored forensic intelligence in document examination, and Gupta and Kumar (2020) advanced forensic document examination systems using boosting and bagging methodologies, yet both lacked application to the banking sector in Kenya.

Regionally, Wambugu (2024) focused on forensic document examination in land fraud investigations at the Directorate of Criminal Investigations, while Khator (2020) examined travel document fraud detection at Jomo Kenyatta International Airport—contexts that differ from banking. Mukama (2022) addressed mobile financial services in Uganda, presenting a contextual gap outside commercial banking. Broader studies by Kaur, Sood, and Grima (2023) and Taylor (2021) demonstrated knowledge gaps due to limited sectoral and regional relevance. Fiia (2013) and Sule, Ibrahim, and Sani (2019) also revealed contextual gaps by focusing on public sector corruption and Nigeria's banking system, respectively. Mohamed

and Ali (2023) studied Somali banks without reflecting Kenyan dynamics, while Adejumo and Ogburie (2025) generalized forensic accounting across developing countries. Methodologically, Yuniati and Banjarnahor (2021) concentrated on external auditors' roles instead of forensic techniques within banks.

The current study seeks to bridge these gaps by focusing specifically on the effect of forensic accounting techniques on fraud detection in commercial banks in Kenya. It addresses the theoretical, methodological, and contextual limitations of prior research, thereby providing sector-specific and regionally relevant insights into how forensic accounting can enhance fraud detection mechanisms within the Kenyan banking industry.

2.5 Conceptual Framework

A conceptual framework serves as a visual or theoretical representation of the relationship between variables in a study, guiding the research process by providing a clear understanding of how the variables are interrelated (Miles & Huberman, 2024). The independent variables in this study include forensic accounting data analysis techniques, forensic accounting technology, and forensic accounting investigation techniques. The dependent variable, fraud detection, refers to the ability to identify, assess, and prevent fraudulent activities within financial institutions. Figure 2.1 shows the conceptual framework.

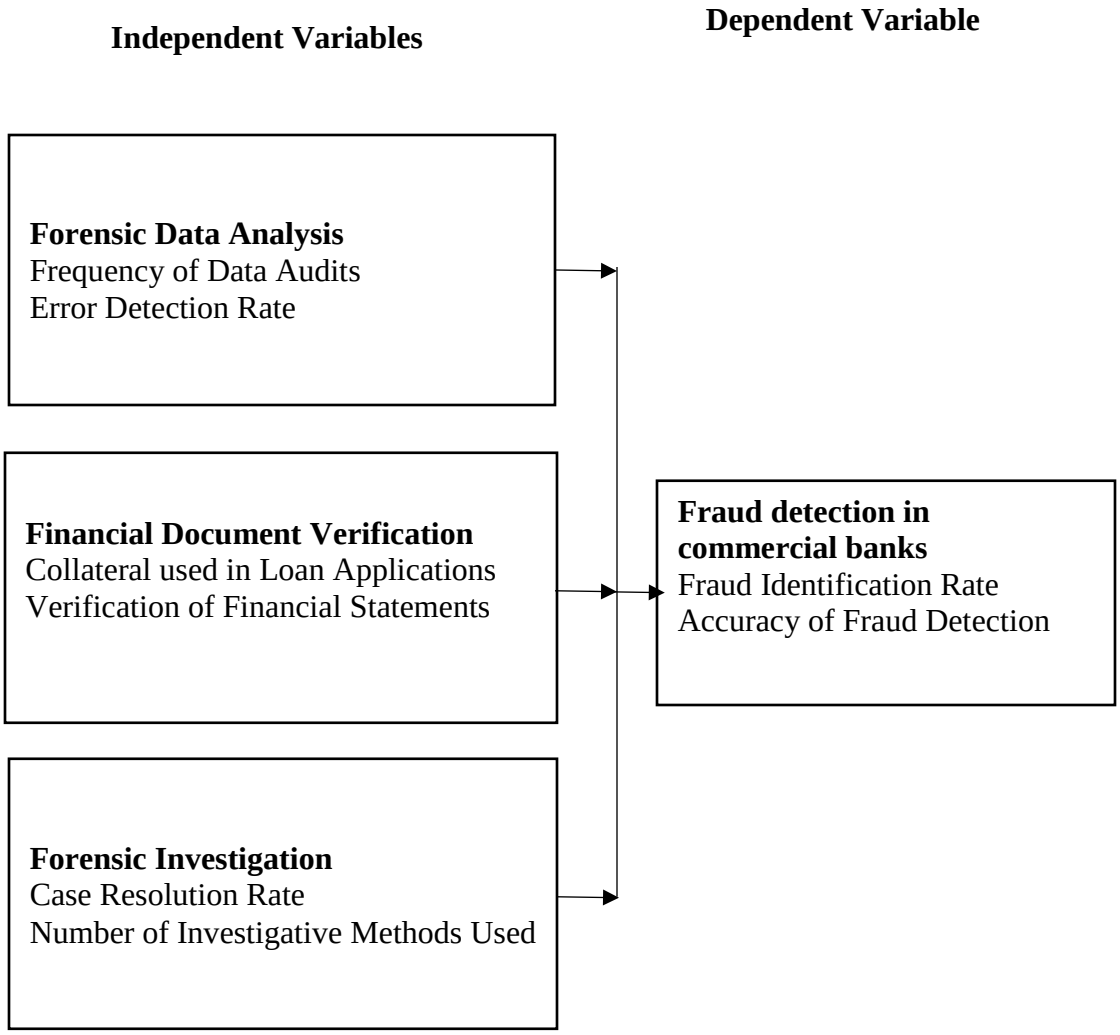


Figure 2. 1 Conceptual Framework

2.6 Operationalization of the Variables

Table 2. 1: Operationalization of the Variables

Variable	Type of Variable	Indicators	Measurement Scale
Fraud Detection	Dependent Variable	Fraud Identification Rate	Likert Scale (1 = Strongly Disagree, 5 = Strongly Agree)
		Accuracy of Fraud Detection	Likert Scale (1 = Strongly Disagree, 5 = Strongly Agree)
		Reduction in Fraud Incidence	Likert Scale (1 = Strongly Disagree, 5 = Strongly Agree)
		Loss Recovery Rate	Likert Scale (1 = Strongly Disagree, 5 = Strongly Agree)
Forensic Data Analysis Techniques	Independent Variable	Frequency of Data Audits	Likert Scale (1 = Strongly Disagree, 5 = Strongly Agree)
		Error Detection Rate	Likert Scale (1 = Strongly Disagree, 5 = Strongly Agree)
		Time Taken for Data Analysis	Likert Scale (1 = Strongly Disagree, 5 = Strongly Agree)
		Data Accuracy Improvement	Likert Scale (1 = Strongly Disagree, 5 = Strongly Agree)
Financial Document Verification Technology	Independent Variable	Technology Utilization Rate	Likert Scale (1 = Strongly Disagree, 5 = Strongly Agree)
		System Response Time	Likert Scale (1 = Strongly Disagree, 5 = Strongly Agree)
		loan agreements	Likert Scale (1 = Strongly Disagree, 5 = Strongly Agree)
		credit applications	Likert Scale (1 = Strongly Disagree, 5 = Strongly Agree)
Forensic Investigation Techniques	Independent Variable	Case Resolution Rate	Likert Scale (1 = Strongly Disagree, 5 = Strongly Agree)
		Number of Investigative Methods Used	Likert Scale (1 = Strongly Disagree, 5 = Strongly Agree)
		Average Investigation Duration	Likert Scale (1 = Strongly Disagree, 5 = Strongly Agree)
		Stakeholder Satisfaction Score	Likert Scale (1 = Strongly Disagree, 5 = Strongly Agree)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter outlines the general approach of the study is described. It detailed the research tools employed and the methods used in the data collection process. The chapter focused on the research design, target population, sample size, data collection methods, empirical model, method of data analysis, and ethical considerations employed in the study.

3.2 Research Design

Research design served as the blueprint for collecting, measuring, and analyzing data (Cooper & Schindler, 2008). For this study, a descriptive research design was adopted. The descriptive research design was deemed appropriate as it helped provide answers to the questions of who, what, when, where, and how associated with the specific research problem (Cooper & Schindler, 2008). Furthermore, the descriptive research design enabled the researcher to obtain information on the effect of forensic accounting techniques on fraud detection in commercial banks in Kenya.

3.3 Target Population

The target population refers to the specific group about which information was required (McDaniel, 2018). According to the Central Bank of Kenya (CBK, 2025), there were 43 licensed commercial banks operating in Kenya (see Appendix II: List of Banks in Kenya). The unit of analysis for the study was the commercial bank. One structured questionnaire was issued to each bank, targeting a key informant such as a senior officer in charge of finance, risk, or audit. This approach ensured that data was collected directly from decision-makers with firsthand knowledge of financial operations and fraud detection practices. The inclusion

criteria required the respondent to be a serving senior officer with at least two years of continuous service, while the exclusion criteria applied to junior staff, employees on probation, or those with less than two years of service.

Table 3. 1: Target Population

Category	Frequency	Percentage
Commercial Banks	43	100%
Total	43	100.000

Source: Author (2025)

3.4 Sampling Procedures and Sample Size

No sampling was undertaken in this study. Mugenda and Mugenda (2003) note that when the target population is fewer than 100, it is advisable to study the entire population rather than select a sample, as this enhances the accuracy and reliability of findings. The target population of this study consisted of all 43 licensed commercial banks in Kenya, which falls below this threshold. Consequently, the study adopted a census approach, where two questionnaires were issued to each bank to ensure coverage in case of non-responses. The respondents were randomly selected from key positions within the banks, including the General Manager, Finance Manager, and Accountant. This approach was deemed appropriate because it eliminated sampling bias, ensured full representation of the banking sector, and provided comprehensive data that accurately reflected the perspectives of commercial banks in Kenya.

3.5 Instruments

The researcher utilized primary data collection methods, employing online questionnaires as the main tool. These questionnaires were designed to elicit specific empirical data from respondents to address the research objectives (Mwita, 2022). Primary data, as described by Mwita et al. (2022), referred to information that was original and directly relevant to the research problem. The questionnaires served as data collection instruments, as defined by Zikmund (2020), enabling the gathering of research data. The choice of data collection methods was influenced by factors such as the nature of the research problem and available resources, including time and budget considerations (Cooper & Schindler, 2021).

3.6 Data Collection Procedure

Prior to commencing the data collection process, a research authorization permit was obtained from KCA University. Primary data collection was conducted using structured online questionnaires created through Google Forms and administered to the respondents. The data collection process was carried out over a period of three months, from June 2025 to August 2025, allowing sufficient time for responses and follow-ups. The questionnaires consisted of closed-ended questions designed to align with the study's objectives, utilizing a Likert Scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). This approach ensured that the data collected was specific and relevant to the research variables.

The questionnaire was divided into several sections to address different aspects of the study. Section 1 captured the demographic characteristics of the respondents, providing essential background information. Section 2 focused on the effect of forensic accounting data analysis on fraud detection in commercial banks in Kenya. Section 3 assessed the impact of forensic accounting practices on fraud detection within the same context. Section 4 examined

the effect of forensic accounting investigations on fraud detection in commercial banks. Lastly, Section 5 explored broader aspects of fraud detection in commercial banks in Kenya, with respondents' views captured using the Likert Scale to ensure consistency and clarity. This structured and systematic approach facilitated the effective collection and analysis of data within the specified duration to meet the study's objectives.

3.7 Validity and Reliabi1ity of Research

3.7.1 Validity

The suitableness, significance, and utility of any conclusions drawn from the gathered data were referred to as validity. A significant conclusion clarified the importance of the data collected using the tools, while a suitable conclusion was considered relevant to the research objectives. According to Kombo and Tromp (2021), there are three types of validity: content-related validity, criterion-related validity, and construct-related validity. Kombo and Tromp (2022) also stated that employing someone with expertise in a particular field was a common practice for assessing the appropriateness of measurements. The accuracy of the investigation's tools was evaluated by consulting the project supervisor in the field, particularly from the KCA University Faculty of Business an.

3.7.2 Reliability

The reliability of the study instruments was evaluated based on their consistency in yielding similar results across multiple tests. Unplanned errors, stemming from factors not adequately controlled by the researcher, could have adversely affected reliability. Nunnally (2021) indicated that a Cronbach's alpha value of 0.7 or higher was acceptable in social science research. Using this criterion, the instruments used in the study were expected to demonstrate satisfactory reliability. The fraud detection construct was also assessed to confirm its reliability

in the study. These evaluations underscored the effectiveness of the measurement instruments in capturing the intended constructs, consistent with recommendations from various authors in the field (Mwangi & Wambua, 2020; Nunnally, 2021). The pilot study was conducted at Cooperative bank of Kenya, National bank, Sidian Bank and KCB Bank all in Kitui County

3.8 Diagnostic Tests

Diagnostic tests was conducted to ensure the validity and reliability of the regression analysis results.

3.8.1 Normality

Normality was assessed using the Shapiro-Wilk test to evaluate whether the residuals of the regression model were normally distributed. A significance level of 0.05 was employed to determine normality. If the p-value was greater than 0.05, it indicated that the residuals followed a normal distribution, which is a key assumption for linear regression analysis. This step was crucial in ensuring that the statistical inferences drawn from the regression results were valid and reliable.

3.8.2 Multicollinearity

Multicollinearity was examined through the Variance Inflation Factor (VIF). A VIF value exceeding 10 indicated significant Multicollinearity among the independent variables, suggesting that they were highly correlated. This analysis helped identify any redundancy in the predictors, which could have inflated the standard errors and potentially affected the stability of the regression coefficients. By checking for Multicollinearity, the analysis aimed to ensure that each independent variable contributed uniquely to the model.

3.8.3 Autocorrelation

Autocorrelation was tested using the Durbin-Watson statistic, which measured the degree of correlation between residuals from different time periods. A value close to 2 indicated no autocorrelation, while values significantly lower than 2 suggested positive autocorrelation, and values significantly higher than 2 indicated negative autocorrelation. Detecting autocorrelation was vital for time series data, as it could have violated the assumption of independent errors, potentially leading to biased statistical results.

3.8.4 Homoscedasticity

Homoscedasticity was evaluated by inspecting the scatterplot of residuals versus fitted values. This assessment aimed to ensure that the variance of the residuals remained constant across all levels of the independent variables. A random scatter of points around zero indicated homoscedasticity, while a pattern or funnel shape suggested heteroscedasticity. Addressing any issues with homoscedasticity was important to maintain the reliability of the regression analysis.

3.8.5 Linearity

Linearity was assessed by plotting the predicted values against the actual values to confirm that a linear relationship existed between the dependent and independent variables. A linear pattern in the plot indicated that the assumptions of linearity were satisfied, suggesting that the linear regression model was appropriate for the data. This evaluation was essential for ensuring that the model accurately represented the relationship between the variables under investigation.

3.9 Data Analysis

Data analysis involved the use of descriptive statistics such as percentages, means, and standard deviations, alongside inferential statistics using the SPSS data analysis tool. The study ascertained the direction and strength of relationships between forensic accounting techniques and fraud detection in commercial banks in Kenya using correlational analysis. Data were presented using both descriptive and inferential statistics with the aid of the Statistical Package for Social Sciences (SPSS) Version 26.0. Descriptive statistics such as frequencies, percentages, means, and standard deviations were employed to summarize respondents' demographic information and general perceptions of forensic accounting techniques. Inferential statistics were then conducted to establish the relationship between forensic accounting techniques (independent variable) and fraud detection (dependent variable). Specifically, correlational analysis was used to determine the strength and direction of the relationship, while a multiple linear regression model was applied to assess the predictive effect of forensic accounting techniques on fraud detection. Tables, charts, and graphs were used to ensure clarity and ease of interpretation. The correlation coefficient method was employed to assess the nature of these relationships. Additionally, a multiple linear regression model was applied to analyze the relationship between forensic accounting techniques (independent variable) and fraud detection (dependent variable). The regression model was represented as follows:

Regression model

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \epsilon$$

Where:

- **Y** = Fraud Detection (dependent variable)

- β_0 = Intercept (constant term)
- $\beta_1, \beta_2, \beta_3$ = Coefficients for the independent variables
- X_1 = Forensic data analysis
- X_2 = Financial Document Verification on fraud detection
- X_3 = Forensic investigation
- ϵ = Error term

This model provided insights into the impact of various forensic accounting techniques on the effectiveness of fraud detection in commercial banks.

3.10 Ethical Consideration

The research process was guided by fundamental ethical principles to safeguard the rights and well-being of all participants. These principles included respect for individuals, maintaining confidentiality, obtaining informed consent, avoiding harm, ensuring integrity and transparency in data collection and analysis, and upholding fairness and impartiality in the interpretation of results. By observing these principles, the researcher ensured that the study was conducted responsibly and ethically.

The study also adhered to established procedures consistent with best research practices. Approval was sought from KCA University and the National Commission for Science, Technology, and Innovation (NACOSTI). All collected data were handled with the utmost confidentiality and stored securely to protect participants' privacy. The findings of the study were disseminated through multiple channels to ensure that the results reached relevant stakeholders. A final report was submitted to KCA University as part of the academic requirements. In addition, the findings were shared with participating commercial banks through summary briefs to inform policy and practice in fraud detection. The researcher also

presented the study outcomes at academic forums, conferences, and workshops, and, where possible, aimed to publish in peer-reviewed journals to contribute to the body of knowledge on forensic accounting and fraud detection in Kenya.

CHAPTER FOUR

DATA ANALYSIS, INTERPRETATION AND DISCUSSION

4.1 Introduction

This section presents the data analysis and findings of the study. The chapter is systematically organized into several sections, including factor analysis, reliability, validity, and response rate, demographic characteristics of the respondents, descriptive analysis, diagnostic tests, and inferential statistics. These sections collectively examine the effect of forensic accounting techniques on fraud detection among commercial banks in Kenya.

4.2 Reliability of Research Instrument

The reliability of the research instrument was assessed using Cronbach's Alpha coefficient, which measures internal consistency among the items used to represent each construct.

Table 4. 1: Reliability of Research Instrument

Variable	Cronbach's Alpha	No of Items	Recommendation
Forensic Data Analysis	0.931	8	reliable
Financial Document Verification	0.844	8	reliable
Forensic Investigation	0.864	8	reliable
Fraud Detection	0.836	8	reliable

Source: Research Survey Data: (2025)

The reliability of the research instrument was assessed using Cronbach's Alpha coefficient, which measures the internal consistency among items used to represent each construct. As shown in Table 4.1, all variables recorded Cronbach's Alpha values above the acceptable threshold of 0.7, indicating high internal reliability. Specifically, forensic data analysis had a coefficient of 0.931, financial document verification recorded 0.844, forensic

investigation obtained 0.864, and fraud detection achieved 0.836. These results confirmed that all constructs were reliable and that the measurement items consistently captured the intended dimensions of forensic accounting techniques and fraud detection (Nunnally, 2021; Mwangi & Wambua, 2020).

4.4 Validity

The validity of the research instrument was assessed using the Average Variance Extracted (AVE), which measures the extent to which indicators of a construct explain the variance of that construct relative to measurement error. Table 4.2 shows the results.

Table 4. 2: Validity Test

Latent Variables	AVE Coefficient
Forensic Data Analysis	0.747
Financial Document Verification	0.704
Forensic Investigation	0.814
Fraud Detection	0.831

Source: Research Survey Data: (2025)

An AVE value of 0.5 or higher is generally considered acceptable, indicating adequate convergent validity. As presented in Table 4.2, all constructs recorded AVE coefficients above the recommended threshold. Specifically, forensic data analysis had an AVE of 0.747, financial document verification recorded 0.704, forensic investigation obtained 0.814, and fraud detection achieved 0.831. These findings confirmed that the measurement items used in the study exhibited strong convergent validity, meaning that the constructs were well represented by their observed variables (Fornell & Larcker, 1981).

4.5 Response Rate

The study sought to determine the response rate of the administered questionnaires to evaluate the level of participation among the targeted respondents**.**

Table 4. 3: Response Rate

Categories	Frequency	Percentages
Returned Questionnaires	32	74
Non-Returned Questionnaires	11	26
Total	43	100

Source: Research Survey Data: (2025)

As shown in Table 4.3, out of the 43 questionnaires distributed to respondents across the selected commercial banks, 32 were successfully completed and returned, representing a response rate of 74 percent, while 11 questionnaires were not returned, accounting for 26 percent. According to Mugenda and Mugenda (2003), a response rate of 70 percent or more is considered adequate for data analysis and reporting in survey research. Therefore, the response rate achieved in this study was deemed satisfactory and sufficient for drawing reliable conclusions based on the collected data.

4.4 Demographic characteristics of the Participants

The research sought to analyze the demographic characteristics of the participants to provide background information and enhance understanding of the respondents' profiles.

Table 4. 4: Demographic Characteristics

Gender	Frequency	Percent
Male	22	69
Female	10	31
Total	32	100
Age Bracket	Frequency	Percent

20–30 years	2	6
31–40 years	6	19
41–50 years	13	41
51 and above	11	34
Total	32	100
Education Level	Frequency	Percent
Diploma	9	28
Bachelor's Degree	17	53
Master's Degree	4	13
PhD	2	6
Total	32	100
Years of Experience in Banking	Frequency	Percent
Less than 5 years	3	9
5–10 years	3	9
11–15 years	8	25
Above 15 years	18	56
Total	32	100

Source: Research Survey Data: (2025)

The findings revealed that the majority of the respondents were male, accounting for 69 percent, while females represented 31 percent. This implies that the banking sector is still largely male-dominated, consistent with findings from previous studies on gender distribution in financial institutions (Omondi & Kilonzo, 2021).

Regarding age distribution, most respondents (41 percent) were aged between 41 and 50 years, followed by 34 percent who were aged 51 years and above, 19 percent between 31 and 40 years, and 6 percent between 20 and 30 years. This indicates that the majority of respondents were mature professionals with significant work experience in the banking industry.

In terms of education level, 53 percent of the respondents held a bachelor's degree, 28 percent had a diploma, 13 percent possessed a master's degree, and 6 percent held a PhD qualification. These results suggest that most participants were well-educated and professionally qualified to provide reliable information on forensic accounting practices, aligning with the findings of Kamau and Njeru (2022), who established that higher education levels improve analytical competence and enhance accountability in financial management.

Concerning work experience, 56 percent of respondents had more than 15 years of experience, 25 percent had between 11 and 15 years, while 9 percent each had less than 5 years and between 5 and 10 years of experience. This indicates that a majority of the respondents were highly experienced, implying that the data obtained were informed by individuals with extensive exposure to banking operations and fraud detection practices (Kiptoo & Wanjiku, 2020).

4.5 Descriptive statistics

Data for this study were systematically gathered in accordance with the research objectives through the use of a document review guide and a structured questionnaire anchored on a five-point Likert scale. The Likert scale enabled respondents to indicate their degree of agreement with the provided statements, where 5 = Strongly Agree, 4 = Agree, 3 = Neutral, 2 = Disagree, and 1 = Strongly Disagree. The instrument was designed with a predetermined sequence of items to ensure uniformity, clarity, and precision in responses. This structured approach facilitated reliable measurement of perceptions and enhanced the accuracy and interpretability of the data during analysis.

4.5.1 Forensic Data Analysis on Fraud Detection

The first objective of the study was to determine the effect of forensic data analysis on fraud detection among commercial banks in Kenya.

Table 4. 5: Forensic Data Analysis on Fraud Detection

Statements	N	Mean	Std. Deviation
Regular forensic data audits are conducted in this bank	32	3.97	1.23
Forensic data analysis helps in early detection of fraudulent activities	32	3.34	0.90
The bank uses advanced data mining tools for fraud detection.	32	3.47	1.16
Error detection rate has improved due to forensic data analysis.	32	4.16	1.44
Forensic data analysis enhances transparency in financial reporting	32	3.34	0.90
Data audits are effective in identifying unusual financial patterns.	32	3.47	1.16
Forensic data analysis reduces cases of undetected fraud.	32	4.16	1.44
The frequency of data audits contributes to fraud detection efficiency	32	3.62	1.01
Aggregate		3.69	1.16

Source: Research Survey Data: (2025)

Finding on table 4.5 shows that the statement “Error detection rate has improved due to forensic data analysis” recorded the highest level of agreement with a mean (M = 4.16, SD = 1.44), followed by “Forensic data analysis reduces cases of undetected fraud” which also had a mean (M = 4.16, SD = 1.44). This indicates that respondents strongly believed that the application of forensic data analysis enhances the accuracy of error detection and minimizes undetected fraudulent activities within commercial banks.

The statement “The frequency of data audits contributes to fraud detection efficiency” registered a mean (M = 3.62, SD = 1.01), suggesting a moderate level of agreement among participants. Similarly, “Regular forensic data audits are conducted in this bank” had a mean (M = 3.97, SD = 1.23), implying that while most banks conduct such audits, their regularity and depth may vary across institutions.

Moderate agreement was also noted for “The bank uses advanced data mining tools for fraud detection” and “Data audits are effective in identifying unusual financial patterns,” both with a mean (M = 3.47, SD = 1.16). This suggests that although forensic data mining tools are recognized as valuable in detecting irregularities, their utilization may be hindered by technological limitations and cost implications.

The least-rated statements were “Forensic data analysis helps in early detection of fraudulent activities” and “Forensic data analysis enhances transparency in financial reporting,” both with a mean (M = 3.34, SD = 0.90). This indicates that while respondents acknowledged the role of forensic data analysis in promoting transparency and early fraud identification, these practices might not be consistently applied in all commercial banks.

Overall, the results revealed that participants moderately agreed on the effectiveness of forensic data analysis in detecting fraud, with an aggregate mean of 3.69 and a standard deviation of 1.16. Similar findings were reported by Otieno and Karanja (2021), who established that the adoption of forensic data analysis significantly improves the detection and prevention of fraudulent activities in financial institutions.

4.5.2 Financial document verification on fraud detection

The second objective of the study was to determine the effect of financial document verification on fraud detection among commercial banks in Kenya.

Table 4. 6: Financial document verification on Fraud Detection

Statement	N	Mean	Std. Deviation
The bank uses forensic accounting software for fraud detection	32	3.72	0.99
Technology utilization rate in fraud detection is high in this bank.	32	4.53	0.51
The bank uses forensic accounting software for fraud detection	32	3.72	1.30
Technology utilization rate in fraud detection is high in this bank	32	4.00	1.34
Loan documents and customer financial records are regularly scrutinized for inconsistencies	32	4.53	0.51
The bank applies forensic techniques to verify the authenticity of collateral used in loan applications	32	3.72	1.30
Suspicious financial documents are flagged and subjected to detailed forensic review.	32	4.00	1.34
Forensic verification of financial statements helps the bank detect fraud at an early stage.	32	4.00	1.22
Aggregate		4.03	1.06

Source: Research Survey Data: (2025)

On Table 4.6, the statement “Loan documents and customer financial records are regularly scrutinized for inconsistencies” recorded the highest level of agreement with a mean (M = 4.53, SD = 0.51). This finding indicates that most banks actively review loan and customer records to identify discrepancies, which enhances the accuracy and credibility of financial reporting.

Similarly, the statement “Technology utilization rate in fraud detection is high in this bank” also registered a relatively high level of agreement with a mean (M = 4.00, SD = 1.34), showing that banks are increasingly adopting digital technologies and forensic tools to

strengthen fraud detection processes. Moreover, the statement "Suspicious financial documents are flagged and subjected to detailed forensic review" had a mean (M = 4.00, SD = 1.34), further emphasizing that proactive identification and forensic scrutiny of irregular documents play a crucial role in minimizing fraudulent activities.

Moderate agreement was observed for the statements "The bank uses forensic accounting software for fraud detection" and "The bank applies forensic techniques to verify the authenticity of collateral used in loan applications," both recording means (M = 3.72, SD = 1.30). This suggests that while banks acknowledge the value of such technologies, full integration of forensic verification tools may still be at a developmental stage.

Additionally, the statement "Forensic verification of financial statements helps the bank detect fraud at an early stage" had a mean (M = 4.00, SD = 1.22), demonstrating that the application of forensic verification techniques improves early detection and prevention of financial irregularities.

Overall, the results revealed a high level of agreement among respondents on the importance of financial document verification in detecting and preventing fraud, with an aggregate mean of 4.03 and a standard deviation of 1.06. These findings align with those of Gacheri and Njoroge (2021), who found that thorough financial document verification enhances fraud detection efficiency and improves internal control systems in commercial banks.

4.5.3 Forensic investigation on fraud detection

The third objective was to examine the effect of forensic investigation on fraud detection among commercial banks in Kenya. As presented in Table 4.7.

Table 4. 7: Forensic Investigation on Fraud Detection

Statement	N	Mean	Std. Deviation
Forensic investigation techniques are effective in fraud detection	32	4.47	0.51
Case resolution rate has improved due to forensic investigation	32	3.97	1.26
The number of investigative methods used enhances fraud detection	32	3.88	1.34
Forensic investigation helps in identifying fraud perpetrators	32	4.50	0.80
Investigations are thorough and evidence-based.	32	3.97	1.26
Forensic investigations reduce repeat fraud cases.	32	3.88	1.34
Collaboration between investigators enhances fraud detection outcomes	32	3.94	1.34
Investigative reports contribute to improved fraud prevention strategies	32	4.31	1.06
Aggregate		4.12	1.11

Source: Research Survey Data: (2025)

The statement "Forensic investigation helps in identifying fraud perpetrators" recorded the highest level of agreement with a mean (M = 4.50, SD = 0.80). This finding suggests that forensic investigations play a crucial role in uncovering individuals responsible for fraudulent activities, thereby enhancing accountability within banking institutions.

Similarly, the statement "Forensic investigation techniques are effective in fraud detection" also received strong agreement with a mean (M = 4.47, SD = 0.51), indicating that respondents recognized the practical value of applying forensic investigation methods in detecting and curbing fraud within commercial banks. In addition, "Investigative reports contribute to improved fraud prevention strategies" attained a mean (M = 4.31, SD = 1.06), implying that findings from forensic investigations are not only used for resolving current cases but also for strengthening preventive mechanisms and internal controls.

Moderate levels of agreement were observed for the statements “Case resolution rate has improved due to forensic investigation” and “Investigations are thorough and evidence-based,” both of which had means (M = 3.97, SD = 1.26). This suggests that while forensic investigations have improved the handling and closure of fraud cases, there may still be variations in investigative rigor across different banks. Similarly, the statements “The number of investigative methods used enhances fraud detection” and “Forensic investigations reduce repeat fraud cases” each recorded means (M = 3.88, SD = 1.34), reflecting that diversity in investigative methods contributes positively to fraud management but may vary in implementation levels among institutions.

Furthermore, the statement “Collaboration between investigators enhances fraud detection outcomes” had a mean (M = 3.94, SD = 1.34), suggesting that teamwork and information sharing among forensic experts significantly strengthen the effectiveness of fraud investigations.

Overall, the findings revealed that respondents perceived forensic investigation as a critical component of fraud detection and prevention in commercial banks, with an aggregate mean of 4.12 and a standard deviation of 1.11. These results concur with those of Kiprotich and Ndegwa (2020) that systematic forensic investigations contribute to improved case resolution, reduced recurrence of fraud, and better fraud prevention strategies within Kenya’s banking sector.

4.5.4 Fraud detection

The dependent variable of the study was fraud detection, which aimed to assess how effectively commercial banks in Kenya identify, prevent, and manage fraudulent activities through the application of forensic accounting techniques.

Table 4. 8: Fraud detection

Statement	N	Mean	Std. Deviation
Fraud identification rate has improved in this bank.	32	3.62	1.01
Accuracy of fraud detection is enhanced by forensic accounting techniques.	32	3.72	0.99
Fraud cases are detected at early stages through forensic methods	32	4.53	0.51
Forensic accounting techniques reduce financial losses due to fraud.	32	3.72	1.30
Fraud detection mechanisms are effective in this bank.	32	4.00	1.34
Use of forensic techniques improves confidence in fraud reporting	32	4.53	0.51
Fraud detection contributes to improved organizational performance	32	3.72	1.30
Overall, forensic accounting techniques strengthen fraud prevention	32	4.00	1.34
Aggregate		3.98	1.04

Source: Research Survey Data: (2025)

As presented in Table 4.8, the statement "Fraud cases are detected at early stages through forensic methods" recorded the highest level of agreement with a mean (M = 4.53, SD = 0.51). This finding implies that the integration of forensic accounting tools and analytical procedures enables banks to uncover fraudulent activities promptly, minimizing potential financial losses. Similarly, the statement "Use of forensic techniques improves confidence in fraud reporting" also received a high rating with a mean (M = 4.53, SD = 0.51), suggesting that the adoption of forensic practices enhances transparency and trust in internal fraud management systems.

Moderate levels of agreement were observed for "Fraud detection mechanisms are effective in this bank" and "Overall, forensic accounting techniques strengthen fraud prevention," both recording means (M = 4.00, SD = 1.34). This indicates that the majority of respondents recognized the effectiveness of existing fraud detection systems, particularly when

integrated with forensic methodologies. Additionally, the statements “Accuracy of fraud detection is enhanced by forensic accounting techniques” and “Forensic accounting techniques reduce financial losses due to fraud” both recorded means (M = 3.72, SD = 0.99), demonstrating that forensic tools contribute significantly to improving precision in fraud identification and minimizing economic impacts associated with fraudulent transactions.

Furthermore, “Fraud identification rate has improved in this bank” yielded a mean (M = 3.62, SD = 1.01), suggesting steady progress in the ability of banks to detect fraud cases efficiently. The statement “Fraud detection contributes to improved organizational performance” also had a mean (M = 3.72, SD = 1.30), implying that enhanced fraud detection practices positively influence institutional stability and performance outcomes. The findings revealed that participants perceived forensic accounting techniques as instrumental in strengthening fraud detection and prevention within Kenya’s banking sector, as reflected by the aggregate mean of 3.98 and standard deviation of 1.04. These results align with the findings of Kamau and Mugo (2022), who observed that forensic accounting applications significantly improve early fraud identification, accuracy in detection, and confidence in reporting mechanisms among financial institutions.

4.6 Diagnostic tests

Diagnostic tests were conducted to ensure the validity and reliability of the regression analysis results.

4.6.1 Normality

Normality was assessed using the Shapiro–Wilk test to determine whether the residuals of the regression model were normally distributed, as presented in Table 4.9

Table 4. 9: Normality

	Shapiro-Wilk Statistic	df	Sig.
Forensic Data Analysis	0.815	32	0
Financial Document Verification	0.894	32	0.004
Forensic Investigation	0.96	32	0.273
Fraud Detection	0.905	32	0.008

a Lilliefors Significance Correction

Source: Research Survey Data: (2025)

The results indicated that the variables forensic data analysis (Statistic = 0.815, Sig. = 0.000), financial document verification (Statistic = 0.894, Sig. = 0.004), and fraud detection (Statistic = 0.905, Sig. = 0.008) had significance values below 0.05, suggesting that their distributions deviated slightly from normality. However, the variable forensic investigation (Statistic = 0.960, Sig. = 0.273) had a significance value greater than 0.05, indicating that its data were normally distributed.

Despite the slight deviations from normality in some variables, the Central Limit Theorem supports the assumption that when the sample size is reasonably large ($n > 30$), the sampling distribution of the mean approximates normality. Therefore, the data were considered sufficiently normal for regression analysis. This finding aligns with Kothari (2014), who noted that minor departures from normality do not significantly affect the validity of parametric tests in social science research.

4.6.2 Multicollinearity

Multicollinearity was assessed using the Variance Inflation Factor (VIF) and tolerance values to determine whether the independent variables were highly correlated.

Table 4. 10: Multicollinearity

Model	Collinearity Statistics Tolerance	VIF
Forensic Data Analysis	0.98	1.02
Financial Document Verification	0.70	1.43
Forensic Investigation	0.70	1.42

a Dependent Variable: Fraud Detection

Source: Research Survey Data: (2025)

The findings revealed that all tolerance values were above 0.1 and all VIF values were below the recommended threshold of 10, suggesting the absence of significant Multicollinearity among the predictor variables. Specifically, forensic data analysis recorded a tolerance of 0.98 and a VIF of 1.02, financial document verification had a tolerance of 0.70 and a VIF of 1.43, while forensic investigation posted a tolerance of 0.70 and a VIF of 1.42. These results imply that each independent variable contributed uniquely to the regression model without redundancy or excessive inter-correlation. Therefore, the variables were suitable for inclusion in further regression analysis. According to Field (2018), when tolerance values exceed 0.1 and VIF values remain below 10, the assumption of multicollinearity is considered satisfied, ensuring that the model estimates are reliable and stable.

4.6.3 Autocorrelation

Autocorrelation was examined using the Durbin–Watson (DW) statistic to determine whether the residuals in the regression model were independent.

Table 4. 11: Autocorrelation

Model	Durbin-Watson
1	1.942a

a Predictors: (Constant), Forensic Investigation, Forensic Data Analysis, Financial Document Verification

b Dependent Variable: Fraud Detection

Source: Research Survey Data: (2025)

The analysis produced a Durbin–Watson value of 1.942, which falls within the acceptable range of 1.5 to 2.5. This indicates that there was no significant autocorrelation among the residuals. The absence of autocorrelation suggests that the errors were randomly distributed and not influenced by prior observations, thereby meeting one of the key assumptions of linear regression. According to Field (2018), a Durbin–Watson value close to 2 implies that the residuals are independent, confirming that the model's estimates are reliable and that the data were not affected by serial correlation.

4.6.4 Heteroscedasticity

The assumption of Heteroscedasticity was tested using the Breusch–Pagan Test for Heteroscedasticity, which assesses whether the variance of the residuals remains constant across all levels of the independent variables.

Figure 4. 1: Heteroscedasticity,

Chi-Square	df	Sig.
0.179	1	0.672

a Dependent variable: Fraud Detection

Source: Research Survey Data: (2025)

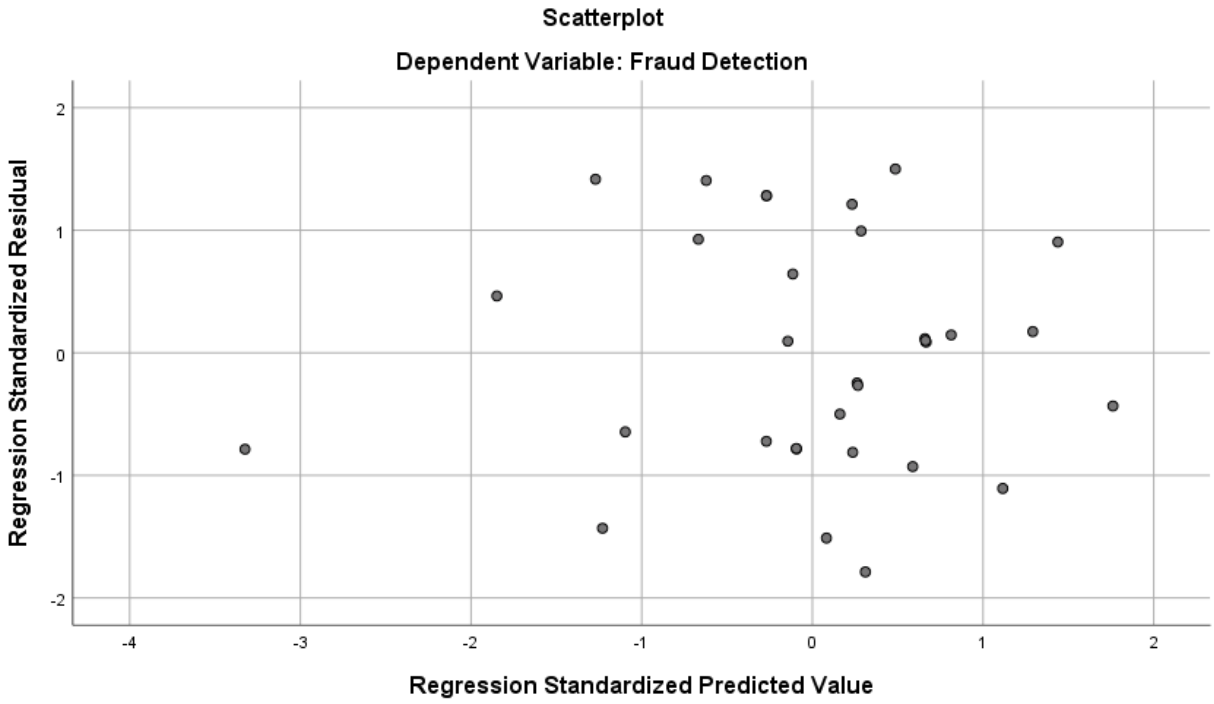
The test produced a Chi-square value of 0.179 with 1 degree of freedom and a significance level of 0.672. Since the p-value was greater than 0.05, the null hypothesis of Heteroscedasticity, was not rejected, indicating that the error variances were constant across

observations. This result implies that the regression model satisfied the Heteroscedasticity, assumption, suggesting that the data were suitable for linear regression analysis. According to Gujarati and Porter (2020), a non-significant Breusch–Pagan test confirms uniformity in residual variance, thereby enhancing the reliability and validity of the regression estimates.

4.6.5: Linearity

Linearity was assessed using a scatterplot of the regression standardized predicted values against the regression standardized residuals, as shown in Figure 4.1.

Figure 4. 2: Linearity



Source: Research Survey Data: (2025)

The plot was used to evaluate whether there was a linear relationship between the independent variables and the dependent variable, Fraud Detection. The scatterplot displayed a random and roughly uniform spread of residuals around the horizontal axis (the zero line), without clear patterns, curves, or systematic deviations. This visual pattern indicated that the

assumption of linearity was satisfied. The relationship between the predictors and the dependent variable could therefore be considered linear, supporting the appropriateness of applying linear regression analysis in this study.

4.7 Inferential analysis

The study conducted an inferential analysis to examine the relationship between forensic accounting techniques and fraud detection among commercial banks in Kenya.

4.7.1 Correlation analysis

The study employed the Pearson Correlation Coefficient to examine the relationships between the independent variables forensic data analysis, financial document verification, and forensic investigation and the dependent variable, fraud detection.

Table 4. 12: Correlation Analysis

		Forensic Data Analysis	Financial Document Verification	Forensic Investigation	Fraud Detection
Forensic Data Analysis	Pearson Correlation	1			
	Sig. (2-tailed)				
Financial Document Verification	Pearson Correlation	-0.128	1		
	Sig. (2-tailed)	0.484			
Forensic Investigation	Pearson Correlation	-0.095	.544**	1	
	Sig. (2-tailed)	0.605	0.001		
Fraud Detection	Pearson Correlation	.815**	.426*	0.212	1
	Sig. (2-tailed)	0	0.015	0.245	

* Correlation is significant at the 0.05 level (2-tailed).

Source: Author (2025)

The correlation analysis examined the relationships between forensic accounting techniques and fraud detection. The results showed that forensic data analysis had a strong positive and statistically significant correlation with fraud detection ($r = 0.815$, $p < 0.05$),

suggesting that the effective use of data analytics enhances banks' ability to identify and prevent fraudulent activities. Financial document verification demonstrated a moderate positive and significant relationship with fraud detection ($r = 0.426$, $p < 0.05$), indicating that careful review of financial statements and documents contributes to improved fraud detection. In contrast, forensic investigation showed a weak and statistically insignificant relationship with fraud detection ($r = 0.212$, $p > 0.05$), implying that its effectiveness may depend on complementary factors such as timely execution and collaboration with regulatory authorities. Overall, these findings highlight that data-driven and document verification approaches are more impactful in strengthening fraud detection mechanisms compared to investigative activities alone.

4.7.2 Regression analysis

Regression analysis was conducted to assess the effect of forensic data analysis, financial document verification, and forensic investigation on fraud detection among commercial banks in Kenya. The results are summarized and discussed based on the model summary, ANOVA, and coefficients tables.

Table 4. 13: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.975a	0.95	0.945	1.49425

a Predictors: (Constant), Forensic Investigation, Forensic Data Analysis, Financial Document Verification
b Dependent Variable: Fraud Detection

Source: Research Survey Data: (2025)

The model summary results revealed a strong positive relationship between the independent variables and fraud detection, with a correlation coefficient (R) of 0.975. The R Square value of 0.950 indicated that 95.0% of the variations in fraud detection were explained

by forensic data analysis, financial document verification, and forensic investigation. The Adjusted R Square value of 0.945 further confirmed the model's robustness and predictive accuracy, signifying that the model provided a good fit for the data.

Table 4. 14: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	1187.482	3	395.827	177.28	.000b
Residual	62.518	28	2.233		
Total	1250	31			

a Dependent Variable: Fraud Detection
b Predictors: (Constant), Forensic Investigation, Forensic Data Analysis, Financial Document Verification

ANOVA Results

Table 4.14 presents the Analysis of Variance (ANOVA) results used to test the overall significance of the regression model. The findings show that the regression model is statistically significant, with an F-value of 177.28 and a corresponding p-value of 0.000, which is less than the significance level of 0.05. This indicates that the independent variables—forensic investigation, forensic data analysis, and financial document verification—jointly have a significant effect on fraud detection among commercial banks in Kenya.

The regression sum of squares (1187.482) is substantially higher than the residual sum of squares (62.518), demonstrating that most of the variation in fraud detection is explained by the predictors included in the model. Therefore, the model provides a good fit for the data and confirms that forensic accounting techniques significantly influence the effectiveness of fraud detection in commercial banks.

Table 4. 15: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	**Std. Error**	**Beta**		
(Constant)	-0.57	3.23		-0.18	0.86
Forensic Data Analysis	1.09	0.05	0.88	20.73	0.00
Financial Document Verification	0.93	0.09	0.54	10.63	0.00
Forensic Investigation	0.01	0.09	0.00	0.07	0.95

a Dependent Variable: Fraud Detection

Source: Research Survey Data: (2025)

The study examined the effect of forensic accounting techniques namely forensic data analysis, financial document verification, and forensic investigation on fraud detection among commercial banks in Kenya.

Correlation Analysis

The correlation analysis revealed that forensic data analysis had a strong positive and statistically significant relationship with fraud detection ($r = 0.815$, $p < 0.05$), suggesting that the effective use of data analytics enhances banks' ability to identify and prevent fraudulent activities. Financial document verification also demonstrated a moderate positive and significant correlation with fraud detection ($r = 0.426$, $p < 0.05$), indicating that careful review of financial statements and related documents contributes to improved detection of fraud. Forensic investigation showed a weak and statistically insignificant relationship with fraud detection ($r = 0.212$, $p > 0.05$), implying that its effectiveness may depend on complementary factors such as timely execution or collaboration with regulatory authorities. These results indicate that analytical and verification-based forensic techniques are more influential in strengthening fraud detection mechanisms than investigative activities alone.

Regression Analysis

The regression model further examined the individual contributions of the three forensic accounting techniques to fraud detection. The fitted regression equation was:

$Y=-0.57+1.09X1+0.93X2+0.01X3+\epsilon$

Where:

Y = Fraud Detection

X_1 = Forensic Data Analysis

X_2 = Financial Document Verification

X_3 = Forensic Investigation

The analysis showed that forensic data analysis had a positive and statistically significant effect on fraud detection ($\beta = 1.09$, $t = 20.73$, $p < 0.05$), meaning that an increase in forensic data analysis practices led to a corresponding increase in fraud detection, holding other factors constant. Financial document verification also had a positive and significant effect ($\beta = 0.93$, $t = 10.63$, $p < 0.05$), confirming that robust verification procedures substantially enhance the detection of fraudulent activities. In contrast, forensic investigation had a positive but statistically insignificant effect ($\beta = 0.01$, $t = 0.07$, $p > 0.05$), indicating that its contribution to fraud detection was not significant compared to the other predictors.

Hypothesis testing

Based on the regression results and correlation analysis provided earlier, the study tested hypotheses as follows using standard statistical decision criteria:

H_{01}: Forensic data analysis has no significant effect on fraud detection among commercial banks in Kenya

- Regression result: $\beta = 1.09$, $t = 20.73$, $p < 0.001$
- Correlation result: $r = 0.815$, $p < 0.01$

Decision: Since the p-value is less than 0.05, we reject H_{01}.

Conclusion: Forensic data analysis has a significant positive effect on fraud detection among

H_{02}: Financial document verification has no significant effect on fraud detection among commercial banks in Kenya

- Regression result: $\beta = 0.93$, $t = 10.63$, $p < 0.001$
- Correlation result: $r = 0.426$, $p < 0.05$

Decision: Since the p-value is less than 0.05, we reject H_{02}.

Conclusion: Financial document verification has a significant positive effect on fraud detection among commercial banks in Kenya.

H_{03}: Forensic investigation has no significant effect on fraud detection among commercial banks in Kenya

- Regression result: $\beta = 0.01$, $t = 0.07$, $p = 0.95$
- Correlation result: $r = 0.212$, $p > 0.05$

Decision: Since the p-value is greater than 0.05, we fail to reject H_{03}.

Conclusion: Forensic investigation does not have a statistically significant effect on fraud detection among commercial banks in Kenya.

4.8 Discussion of findings

The study sought to examine the effect of forensic accounting techniques on fraud detection among commercial banks in Kenya. The findings revealed that forensic data analysis and financial document verification significantly enhanced fraud detection, while forensic investigation had a minimal and statistically insignificant effect.

4.8.1 Forensic data analysis and fraud detection

The results indicated that forensic data analysis had a strong positive and significant effect on fraud detection. This finding aligns with the study by Ngugi and Njeru (2022), who observed that data-driven forensic techniques, such as continuous transaction monitoring and advanced analytics, significantly improve the ability of banks to detect anomalies and prevent fraud. Okoro and Njoroge (2021) highlighted that the integration of forensic data analytics

within financial institutions strengthens internal controls and reduces the occurrence of undetected fraudulent activities. The study underscores that the application of sophisticated analytical tools allows banks to identify patterns indicative of fraud early, thus enhancing overall financial integrity.

4.8.2 Financial document verification and fraud detection

Financial document verification was found to have a moderate positive and significant effect on fraud detection. This finding is consistent with Wambua (2019), who emphasized that rigorous examination of financial statements, loan documentation, and transaction records increases transparency and reduces opportunities for manipulation. In the Kenyan context, banks that implement strict verification protocols including digital authentication and blockchain-based document tracking demonstrate higher resilience against fraudulent practices (Kimani & Mwangi, 2020). The finding confirms that consistent verification processes act as a critical line of defense, complementing analytical tools to improve fraud detection.

4.8.3 Forensic investigation and fraud detection

The study found that forensic investigation had a weak and statistically insignificant effect on fraud detection. This suggests that while investigations are important, their impact may be limited without timely execution, adequate personnel training, and integration with data analysis tools. This observation corroborates findings by Okoro and Njoroge (2021), who noted that investigative efforts alone are less effective if not supported by proactive monitoring systems. In the Kenyan banking sector, delays in investigation and limited expertise among staff can hinder the effectiveness of traditional forensic investigations, highlighting the need for capacity-building initiatives and technological integration.

4.8.4 Synthesis of findings

Overall, the study demonstrates that analytical and verification-based forensic techniques are the most influential in enhancing fraud detection in commercial banks. These findings support the theoretical propositions of the Fraud Triangle Theory, which emphasizes the role of opportunity and control mechanisms in preventing fraud (Cressey, 1953). By adopting robust data analytics and verification procedures, banks can reduce the opportunities for fraud, strengthen internal controls, and improve overall financial performance.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter provides a comprehensive summary of the study's key findings and the conclusions derived from the analyzed results. It further presents practical, policy, and theoretical recommendations aimed at enhancing the effectiveness of forensic accounting practices in fraud detection. The chapter also outlines the study's limitations and proposes areas for future research to advance understanding and application within the field.

5.2 Summary of data analysis

5.2.1 Forensic data analysis and fraud detection

The study found that forensic data analysis had a significant positive effect on fraud detection among commercial banks in Kenya. Respondents affirmed that practices such as regular forensic data audits and error detection mechanisms enhanced the early identification of fraudulent activities. The correlation analysis revealed a strong positive relationship between forensic data analysis and fraud detection ($r = 0.815$, $p < 0.01$), indicating that improved data analytical capabilities directly enhance a bank's ability to uncover financial irregularities. These findings are consistent with the Routine Activity Theory formulated by Marcus Felson in 1979, which emphasizes that the presence of capable guardianship, such as forensic analytical systems, reduces opportunities for crime. The findings also align with studies by Ali and Rehman (2021), Moses (2020), and Nduta and Mwangi (2022), who concluded that data-driven tools like predictive modeling, Benford's Law, and trend analysis improve fraud detection and prevention in financial institutions.

5.2.2 Financial document verification and fraud detection

The study revealed that financial document verification significantly influenced fraud detection in commercial banks in Kenya. Respondents acknowledged that processes such as verifying collateral in loan applications and scrutinizing financial records for inconsistencies contributed to minimizing fraudulent activities. The correlation analysis showed a moderate but positive relationship between financial document verification and fraud detection ($r = 0.426$, $p < 0.05$), suggesting that effective verification systems enhance transparency and accountability in banking operations. These findings are supported by the Rational Choice Theory proposed by Cesare Beccaria in 1964, which explains that stringent verification measures increase the perceived risk of committing fraud. The results concur with Wambugu (2024), who demonstrated that forensic document verification through both physical and digital examination enhances investigative credibility. Similarly, Cruz et al. (2020) found that technological innovations such as AI-driven analytics and block chain applications strengthen document authentication and fraud detection.

5.2.3 Forensic investigation and fraud detection

The study established that forensic investigation also affects fraud detection in commercial banks, though to a lesser extent compared to data analysis and document verification. Respondents noted that forensic investigation assists in identifying perpetrators, improving case resolution, and reducing repeat fraud cases. However, correlation results indicated a weak and statistically insignificant relationship between forensic investigation and fraud detection ($r = 0.212$, $p > 0.05$), implying that investigation alone may not substantially influence fraud detection without complementary preventive measures. These findings are in line with the Fraud Triangle Theory proposed by Donald Cressey in 1971, which posits that

addressing the elements of pressure, opportunity, and rationalization is essential in curbing fraudulent behavior. The results corroborate findings by Kaur, Sood, and Grima (2023), Fiia (2013), and Sani (2019), who emphasized that while forensic investigations enhance fraud prevention and prosecution, their effectiveness depends on integration with broader forensic accounting strategies.

5.3 Conclusions

5.3.1: Forensic data analysis and fraud detection

The study concluded that forensic data analysis plays a crucial role in enhancing fraud detection within commercial banks in Kenya. Through systematic data audits, predictive modeling, and statistical analysis, banks are able to identify irregular financial patterns and detect fraudulent transactions more effectively. These findings confirm that data-driven approaches provide early warning indicators that improve organizational transparency and control mechanisms. The results further reinforce the importance of integrating forensic data analysis into regular banking operations to strengthen internal monitoring systems and minimize the likelihood of undetected fraud. Overall, forensic data analysis emerged as a vital tool for proactive fraud detection and prevention, demonstrating its potential to improve the integrity and accountability of financial institutions in Kenya.

5.3.2: Financial Document Verification and Fraud Detection

The study concluded that financial document verification significantly contributes to effective fraud detection in commercial banks. Rigorous verification of customer and loan documentation helps detect inconsistencies, falsified records, and other forms of financial misrepresentation. By employing forensic accounting tools and technologies such as digital authentication systems, banks enhance transparency and reduce opportunities for fraudulent

manipulation. The results affirm that document verification serves as a deterrent mechanism by increasing the perceived risk of detection among potential fraudsters. Moreover, the study highlighted the need for continuous improvement in verification technologies and staff training to sustain accuracy and reliability in financial reporting. Thus, financial document verification remains an essential component of fraud detection frameworks within the Kenyan banking sector.

5.3.3: Forensic investigation and fraud detection

The study concluded that forensic investigation contributes to fraud detection by uncovering fraudulent schemes and identifying individuals involved in financial misconduct. While its direct influence was less pronounced compared to other forensic techniques, forensic investigation provides critical post-fraud analysis that supports prosecution and strengthens future preventive strategies. The findings suggest that the effectiveness of forensic investigations depends on timely execution, collaboration among investigative teams, and the use of evidence-based methodologies. Moreover, integrating investigative outcomes with preventive controls enhances an institution's overall fraud management capacity. Therefore, forensic investigation should not be viewed in isolation but as a complementary process within the broader forensic accounting framework aimed at safeguarding financial integrity in commercial banks.

5.4 Recommendations

5.4.1 Management recommendations

The study recommends that bank management should institutionalize forensic data analysis practices across all departments to enhance fraud detection and prevention. Management should invest in modern analytical tools capable of identifying suspicious

transactions and anomalies in real time. Continuous training of employees on forensic accounting techniques should be prioritized to build internal expertise and ensure accurate data interpretation. Additionally, management should establish an independent forensic audit unit responsible for monitoring compliance and conducting periodic risk assessments. By fostering a culture of transparency and accountability, banks can reduce vulnerabilities to fraud and strengthen stakeholder confidence. Proper resource allocation to forensic systems and strict adherence to ethical standards are essential for improving operational integrity within the banking sector.

5.4.2 Strategy recommendations

The study recommends that financial institutions adopt a strategic approach that integrates forensic data analysis, financial document verification, and forensic investigation into their overall fraud management frameworks. Developing a comprehensive anti-fraud policy supported by advanced digital technologies, such as blockchain and artificial intelligence, can enhance the effectiveness of fraud detection systems. Strategic collaboration with regulatory bodies, law enforcement agencies, and forensic experts should be encouraged to ensure information sharing and timely response to fraudulent activities. Institutions should also implement continuous monitoring and reporting systems to evaluate the success of their anti-fraud strategies. This strategic alignment will enhance operational efficiency, reduce losses due to fraud, and strengthen the overall financial resilience of commercial banks in Kenya.

5.4.3 Theoretical recommendations

The study recommends further refinement of forensic accounting theories by integrating technological and behavioral dimensions that influence fraud detection. The

findings support the need to expand existing frameworks to account for emerging digital fraud risks in financial systems. The application of forensic data analysis theories should also emphasize predictive modeling and data-driven decision-making for early detection. Additionally, the study suggests that future theoretical models incorporate ethical behavior, institutional culture, and regulatory compliance as key determinants of effective forensic practices. Strengthening theoretical foundations in this area will enhance understanding of how forensic mechanisms interact with human and technological factors to prevent financial crimes in modern banking environments.

5.5 Limitations of the Study

The study was limited by its reliance on data collected from selected commercial banks in Kenya, which may not fully represent all financial institutions across the country. The use of cross-sectional data restricted the ability to establish long-term causal relationships between forensic accounting practices and fraud detection outcomes. Furthermore, some respondents were reluctant to disclose sensitive information related to internal fraud cases due to confidentiality concerns, which may have affected the accuracy of responses. Time and resource constraints also limited the scope of the analysis, particularly in evaluating the effectiveness of emerging forensic technologies. Despite these limitations, the findings provide valuable insights into the role of forensic accounting tools in strengthening fraud detection mechanisms in Kenya's banking sector.

5.6 Recommendation for further studies

Future research should explore the long-term impact of forensic accounting practices on organizational performance using longitudinal data to establish stronger causal relationships. Comparative studies between commercial banks, microfinance institutions, and

SACCOs could also provide deeper insights into how different financial institutions implement and benefit from forensic practices. Further studies may focus on evaluating the role of emerging technologies such as artificial intelligence, machine learning, and blockchain in enhancing forensic data analysis and fraud prevention. Researchers should also examine the moderating effects of organizational culture, leadership ethics, and regulatory frameworks on the success of forensic investigations. Expanding the study across East African countries would enhance the generalizability of findings and contribute to a broader understanding of forensic accounting's role in combating financial fraud.

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Appendix I: Research Instrument

Section A: Demographic Information

Instruction: Please provide accurate demographic information by ticking (✓) the appropriate response.

1. **Gender:**
   - Male
   - Female
2. **Age Bracket:**
   - 20–30 years
   - 31–40 years
   - 41–50 years
   - 51 and above
3. **Education Level:**
   - Diploma
   - Bachelor's Degree
   - Master's Degree
   - PhD
4. **Years of Experience in Banking:**
   - Less than 5 years
   - 5–10 years
   - 11–15 years
   - Above 15 years

Section B: Forensic Data Analysis

Instruction: Please indicate your level of agreement with the following statements using the scale below:

(1 = Strongly Disagree, 2 = Disagree, 3 = Undecided, 4 = Agree, 5 = Strongly Agree)

Statement	**1**	**2**	**3**	**4**	**5**
Regular forensic data audits are conducted in this bank.					
Forensic data analysis helps in early detection of fraudulent activities.					
The bank uses advanced data mining tools for fraud detection.					
Error detection rate has improved due to forensic data analysis.					
Forensic data analysis enhances transparency in financial reporting.					
Data audits are effective in identifying unusual financial patterns.					
Forensic data analysis reduces cases of undetected fraud.					

The frequency of data audits contributes to fraud detection efficiency.					

Section C: Financial Document Verification
Instruction: Please indicate your level of agreement with the following statements using the scale below:
(1 = Strongly Disagree, 2 = Disagree, 3 = Undecided, 4 = Agree, 5 = Strongly Agree

Statement	**1**	**2**	**3**	**4**	**5**
The bank uses forensic accounting software for fraud detection.					
Technology utilization rate in fraud detection is high in this bank.					
The bank uses forensic accounting software for fraud detection.					
Technology utilization rate in fraud detection is high in this bank.					
Loan documents and customer financial records are regularly scrutinized for inconsistencies.					
The bank applies forensic techniques to verify the authenticity of collateral used in loan applications.					
Suspicious financial documents are flagged and subjected to detailed forensic review.					
Forensic verification of financial statements helps the bank detect fraud at an early stage.					

Section D: Forensic Investigation
Instruction: Please indicate your level of agreement with the following statements using the scale below:
(1 = Strongly Disagree, 2 = Disagree, 3 = Undecided, 4 = Agree, 5 = Strongly Agree)

Statement	**1**	**2**	**3**	**4**	**5**
Forensic investigation techniques are effective in fraud detection.					
Case resolution rate has improved due to forensic investigation.					
The number of investigative methods used enhances fraud detection.					

Forensic investigation helps in identifying fraud perpetrators.					
Investigations are thorough and evidence-based.					
Forensic investigations reduce repeat fraud cases.					
Collaboration between investigators enhances fraud detection outcomes.					
Investigative reports contribute to improved fraud prevention strategies.					

Section E: Fraud Detection

Instruction: Please indicate your level of agreement with the following statements using the scale below:

(1 = Strongly Disagree, 2 = Disagree, 3 = Undecided, 4 = Agree, 5 = Strongly Agree)

Statement	**1**	**2**	**3**	**4**	**5**
Fraud identification rate has improved in this bank.					
Accuracy of fraud detection is enhanced by forensic accounting techniques.					
Fraud cases are detected at early stages through forensic methods.					
Forensic accounting techniques reduce financial losses due to fraud.					
Fraud detection mechanisms are effective in this bank.					
Use of forensic techniques improves confidence in fraud reporting.					
Fraud detection contributes to improved organizational performance.					
Overall, forensic accounting techniques strengthen fraud prevention.					

APPENDIX II

BANKS IN KENYA

	Name
1	KCB Bank Kenya Ltd
2	Equity Bank Kenya Limited
3	Co-operative Bank of Kenya Ltd
4	Absa Bank Kenya Plc
5	Diamond Trust Bank Kenya Limited (DTB)
6	NCBA Bank Kenya PLC
7	Standard Chartered Bank Kenya Ltd
8	Stanbic Bank Kenya Ltd
9	I & M Bank Ltd
10	Family Bank Limited
11	National Bank of Kenya Ltd
12	Prime Bank Ltd
13	SBM Bank Kenya Ltd
14	Bank of Africa Kenya Ltd
15	Ecobank Kenya Limited
16	Guaranty Trust Bank (Kenya) Ltd
17	Credit Bank PLC
18	Housing Finance Company of Kenya (HF Group)
19	Gulf African Bank Ltd
20	First Community Bank Ltd
21	Kingdom Bank Ltd
22	Mayfair CIB Bank Ltd
23	Guardian Bank Limited
24	Victoria Commercial Bank Ltd
25	Access Bank (Kenya) PLC
26	African Banking Corporation Ltd (ABC Bank)
27	Bank of Baroda (Kenya) Ltd
28	Bank of India
29	Citibank N.A Kenya
30	Development Bank of Kenya Limited
31	Consolidated Bank of Kenya Ltd
32	M-Oriental Bank Ltd
33	Paramount Universal Bank Ltd
34	Middle East Bank (Kenya) Ltd
35	DIB Bank Kenya Ltd
36	UBA Kenya Bank Ltd
37	Habib Bank AG Zurich
38	Fidelity Commercial Bank Limited

39	Absa Bank Limited
40	Kingdom Bank Limited
41	Imperial Bank Limited
42	Charterhouse Bank Limited
43	Kenya Women Finance Bank

APPENDIX III

Introductions letter

Thika Road, Ruaraka
P.O. Box 56808-00200 Nairobi Kenya
Pilot Line: +254 20 8070408/9

Tel: +254 20 3537842
Fax: +254 20 8561077
Mobile: +254 734 888022, 710 888022
Email: kca@kca.ac.ke
Website: www.kca.ac.ke

BOARD OF POSTGRADUATE STUDIES

KCAU/BPS/2025 *Date: Monday, October 06, 2025*

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

RE: SAMUEL KIOKO KYALO- REG NO.14/04107

It is my distinct pleasure to introduce Samuel Kioko Kyalo, a student at our institution pursuing a Master of Science in Commerce- Finance and Accounting degree in the School of Business.

Samuel is conducting research on the topic ***"Effect of forensic accounting techniques on fraud detection among commercial banks in Kenya"*** which is part of the requirements of the program he is pursuing. The research as well as the data procured thereof shall be used for academic purposes only.

Any assistance accorded to him is highly appreciated.

In case of further inquiry, do not hesitate to contact the undersigned.

Yours faithfully,

DR. JACKSON NDOLO
DIRECTOR, BOARD OF POST GRADUATE STUDIES

APPENDIX IV

APPROVAL LETTER

Thika Road, Ruaraka
P.O. Box 56808-00200 Nairobi Kenya
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Website: www.kca.ac.ke

KCA UNIVERSITY SCIENTIFIC & ETHICS REVIEW COMMITTEE

REF: **KCAU/SERC/SOB0346** **Date: 2nd OCTOBER 2025**

TO: **SAMUEL KIOKO KYALO (14/04107)**

Dear Sir/Madam,

RE: EFFECT OF FORENSIC ACCOUNTING TECHNIQUES IN FRAUD DETECTION IN COMMERCIAL BANKS IN KENYA

This is to inform you that the KCA University Scientific Ethics Review Committee (KCAUSERC) has reviewed and approved your research proposal. Your application approval number is ***KCAUSERC/SOB0346***. The approval period is from **2nd October 2025 to 2nd October *2026*.** This approval is subject to compliance with the following requirements.

i. Only approved documents, including informed consents, study instruments, and MTAs, will be used.
ii. All changes, including (amendments, deviations, and violations), are submitted for review and approval by ***KCAUSERC***.
iii. Death and life-threatening problems and serious adverse events or unexpected adverse events, whether related or unrelated to the study, must be reported to **KCAU*SERC*** within 72 hours of notification.
iv. Any changes, anticipated or otherwise, that may increase the risks or affect the safety or welfare of study participants and others or affect the integrity of the research must be reported to ***KCAUSERC*** within 72 hours.
v. Clearance for export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days before expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days upon completion of the study to ***KCAUSERC***.

Before commencing your study, you will be expected to obtain a research license from the National Commission for Science, Technology and Innovation (NACOSTI) https://research-portal.nacosti.go.ke and also obtain other clearances needed.

Yours sincerely,

Dr. Caroline Ntara,
Chairperson,
KCA University Scientific & Ethics Review Committee.

APPENDIX V

NACOSTI PERMIT

Thika Road, Ruaraka
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BOARD OF POSTGRADUATE STUDIES

KCAU/BPS/2025 *Date: Monday, October 06, 2025*

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION (NACOSTI)
P.O BOX 30623-00100
NAIROBI

Dear Sir/Madam,

RE: SAMUEL KIOKO KYALO- REG NO.14/04107

It is my distinct pleasure to introduce Samuel Kioko Kyalo, a student at our institution pursuing a Master of Science in Commerce- Finance and Accounting degree in the School of Business.

Samuel is conducting research on the topic ***"Effect of forensic accounting techniques on fraud detection among commercial banks in Kenya"***. His study has been reviewed and approved by the University's Ethics Review Committee, Approval No KCAUSERC/SOB0346. The Approval period is from 2nd October, 2025 – 2nd October, 2026.

Any assistance accorded to him is highly appreciated.

Yours faithfully,

DR. JACKSON NDOLO
DIRECTOR, BOARD OF POST GRADUATE STUDIES

APPENDIX VI

RESEARCH LICENSE

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **439911**

Date of Issue: **14/October/2025**

RESEARCH LICENSE

This is to Certify that Mr.. SAMUEL KIOKO KYALO of KCA University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev 2014) in Nairobi on the topic: EFFECT OF FORENSIC ACCOUNTING TECHNIQUES ON FRAUD DETECTION AMONG COMMERCIAL BANKS IN KENYA for the period ending : 14/October/2026.

License No: **NACOSTI/P/25/4180887**

439911

Applicant Identification Number

Ag. Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

See overleaf for conditions

THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013 (Rev. 2014)
Legal Notice No. 108: The Science, Technology and Innovation (Research Licensing) Regulations, 2014

The National Commission for Science, Technology and Innovation, hereafter referred to as the Commission, was the established under the Science, Technology and Innovation Act 2013 (Revised 2014) herein after referred to as the Act. The objective of the Commission shall be to regulate and assure quality in the science, technology and innovation sector and advise the Government in matters related thereto.

CONDITIONS OF THE RESEARCH LICENSE

1. The License is granted subject to provisions of the Constitution of Kenya, the Science, Technology and Innovation Act, and other relevant laws, policies and regulations. Accordingly, the licensee shall adhere to such procedures, standards, code of ethics and guidelines as may be prescribed by regulations made under the Act, or prescribed by provisions of International treaties of which Kenya is a signatory to.
2. The research and its related activities as well as outcomes shall be beneficial to the country and shall not in any way;
    i. Endanger national security
    ii. Adversely affect the lives of Kenyans
    iii. Be in contravention of Kenya's international obligations including Biological Weapons Convention (BWC), Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO), Chemical, Biological, Radiological and Nuclear (CBRN).
    iv. Result in exploitation of intellectual property rights of communities in Kenya
    v. Adversely affect the environment
    vi. Adversely affect the rights of communities
    vii. Endanger public safety and national cohesion
    viii. Plagiarize someone else's work
3. The License is valid for the proposed research, location and specified period.
4. Neither the license nor any rights thereunder are transferable.
5. The Commission reserves the right to cancel the research at any time during the research period if in the opinion of the Commission the research is not implemented in conformity with the provisions of the Act or any other written law.
6. The Licensee shall inform the relevant County Director of Education, County Commissioner and County Governor before commencement of the research.
7. Excavation, filming, movement, and collection of specimens are subject to further necessary clearance from relevant Government Agencies.
8. The License does not give authority to transfer research materials.
9. The Commission may monitor and evaluate the licensed research project for the purpose of assessing and evaluating compliance with the conditions of the License.
10. The Licensee shall submit one hard copy, and upload a soft copy of their final report (thesis) onto a platform designated by the Commission within one year of completion of the research.
11. The Commission reserves the right to modify the conditions of the License including cancellation without prior notice.
12. Research, findings and information regarding research systems shall be stored or disseminated, utilized or applied in such a manner as may be prescribed by the Commission from time to time.
13. The Licensee shall disclose to the Commission, the relevant Institutional Scientific and Ethical Review Committee, and the relevant national agencies any inventions and discoveries that are of National strategic importance.
14. The Commission shall have powers to acquire from any person the right in, or to, any scientific innovation, invention or patent of strategic importance to the country.
15. Relevant Institutional Scientific and Ethical Review Committee shall monitor and evaluate the research periodically, and make a report of its findings to the Commission for necessary action.

National Commission for Science, Technology and Innovation(NACOSTI),
Off Waiyaki Way, Upper Kabete,
P. O. Box 30623 - 00100 Nairobi, KENYA
Telephone: 020 4007000, 0713788787, 0735404245
E-mail: dg@nacosti.go.ke
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