

The Role of Forensic Accounting in Data Analysis to Detect and Reduce Financial Crimes: An Exploratory Study in Commercial Banks

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Abstract

This research aims to identify the role of forensic accounting in analyzing financial data to detect financial crimes in commercial banks. It does so by measuring the relationship between forensic accounting and the reduction of financial crimes. To achieve the research objectives, a questionnaire was developed and distributed to a sample of (10) commercial banks. The questionnaire was distributed and statistically analyzed to arrive at the results. The research concluded that there is a clear understanding that traditional auditing methods are no longer sufficient or effective in addressing the complex and evolving forms of financial crimes. This highlights the urgent need for a specialized (forensic) approach that integrates accounting and legal knowledge. The research concluded with the most important recommendation: commercial banks should strategically adopt forensic accounting by establishing independent organizational units that report to the board of directors or the audit committee, and are dedicated to investigating financial suspicions and analyzing data to uncover crimes.

Keywords (Forensic Accounting – Financial Statements – Financial Crimes – Commercial Banks)

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I. Introduction

Financial crime is a complex phenomenon that cannot be viewed in isolation from its surrounding environment. It arises and evolves as a reflection of changes in social, economic, and technological contexts. With the rapid advancement of information and communication technologies and the increasing complexity of economic activities, financial crimes have become more diverse and multifaceted, giving rise to new patterns of fraudulent practices that are difficult to detect using traditional methods. Many developing countries and Third World nations face the problem of record falsification or high rates of record falsification due to weak regulatory environments. Consequently, auditing bodies have often demonstrated a passive and indifferent attitude toward combating financial crimes, failing to educate the public on the safeguards and professionalism necessary to address record falsification, bribery, and money laundering.

Forensic accounting is one of the most common accounting methods in Arab countries. The lack of qualification of the forensic accountant and auditor may contribute to questioning the credibility of financial statements and reports, as well as other financial operations of the institution (Shanqrai and Babiker, 2015:70). In today's complex economic environment, forensic accounting has become a vital tool for identifying, preventing, and investigating financial fraud. The study results indicate that economic sectors have adopted forensic accounting methods, leading to a decrease in fraudulent activities and improvements in financial reporting. However, there remains a clear deficiency in the comprehensive application of forensic accounting, particularly in small and medium-sized enterprises (SMEs) (Kansara, 2025, p. 281). Academic studies have shown that most economic sectors suffer from widespread corruption due to the use of traditional auditing methods. This has led to the proliferation of major scandals in global corporations, prompting the enactment of the Sarbanes-Oxley Act of 1973. This development has further increased the need for forensic accountants to conduct investigations within economic sectors (Kassem & Carter, 2023). The integration of forensic accounting and legal systems is crucial in combating these financial crimes. Forensic accountants play a pivotal role in investigating and uncovering financial irregularities, providing crucial evidence used in court to prosecute offenders. Their expertise helps bridge the gap between complex financial data and legal requirements, thus ensuring justice is served (Chukwuani, 2024).

Various forms of fraud and corruption are prevalent in both the public and private sectors, but their effects are more severe in the public sector, where they contribute to weak institutional performance, as is the case in the Pakistani public sector (Meteke et al., 2022). In the digital age, forensic accounting has undergone significant development to address the modern complexities associated with digital financial fraud (Zahenk, 2024). The results indicated that the usefulness of forensic accounting services is strongly influenced by the concept of a code

of ethics and commitment, intellectual technique, motivation, training, and the importance of social value. In addition, there was no effect of independence and a sense of belonging in economic units. In a study by Al-Rawashdeh et al. (2020), he presented his study on the obstacles in using information technology in forensic accounting, and the use of information technology in forensic accounting to detect financial fraud, which has an effect on the spread of financial and administrative corruption. The findings indicate that forensic accounting is not only a preventative measure against financial fraud, but also an effective tool for addressing violations after they occur. The importance of forensic accounting lies in maintaining the financial integrity of a company while promoting transparency and accounting disclosure in financial reports (Aspi et al., 2025). The role of forensic accounting is to uncover manipulation and financial fraud within complex economic units, given the use of traditional auditing methods and mechanisms. The findings indicate that forensic accountants must work closely with internal and external users of financial statements, as well as legal and regulatory bodies, to ensure the detection and effective handling of fraudulent activities (Tisfay and Kidani, 2025). One study found weaknesses in the application of forensic accounting in banks in Blue Nile State. Therefore, the application of forensic accounting contributes to reducing financial corruption, despite several obstacles hindering its implementation in Blue Nile State (Radwan et al., 2021:902).

Forensic accounting plays a crucial role in expediting the resolution of financial cases, particularly in insurance company claims, by providing accurate financial evidence that contributes to winning cases or reducing compensation (Almashhadany & Al-Haidari, 2023). Furthermore, forensic accounting relies on integrating accounting and auditing principles with investigative and legal methods, enabling the effective detection and prevention of complex financial fraud (Searle, 2017). Serhiy (2019) pointed to the important role of criminal accounting as an investigative tool to mitigate economic crimes in Ukrainian companies, by combating rampant fraudulent activities, which positively impacted the economic performance of these companies and became a model for Eastern European countries in their quest to develop a sustainable approach to mitigating economic crimes in a way that positively impacts the economies of these countries.

The emergence of forensic accountants has proven highly beneficial to societies, thanks to their knowledge, skills, and capabilities that enable them to provide services that uncover fraudulent activities, detect or mitigate financial corruption, and enhance internal controls. This, in turn, leads to improved financial performance of economic units, better public spending, and enhanced economic well-being for members of society (Khodair & Naaman, 2024:22). Al-Azmi's study (2022) identified the procedures and methods that forensic accounting can employ to achieve sustainable development from the perspective of combating financial and administrative corruption. The study concluded that forensic accountants, with their skills and methods for uncovering cases of financial and administrative corruption, can play a significant role in achieving sustainable development from this perspective. One study found that forensic accounting has a positive and effective impact on the economic or financial dimension of sustainable development. Its application in economic sectors contributes to raising the efficiency of their professional and financial performance, which helps preserve public funds and drive economic development forward (Khodair & Naaman, 2024: 621). The importance of forensic accounting is increasingly evident following the spread of corruption and financial misconduct, which necessitates relying on the expertise of forensic accountants to mitigate these risks. Furthermore, the complexity of modern financial statements and the prevalence of manipulation and financial fraud have contributed to the need to integrate forensic accounting into higher education curricula at both the undergraduate and graduate levels. However, many academic programs lack specialized courses in forensic accounting (Barodiya, 2025: 301). Traditional accounting methods are insufficient for detecting financial fraud, making the need for sophisticated tools essential for reducing fraudulent practices and protecting financial records (Dkhar, 2025). Forensic accounting has evolved to identify and address complex fraudulent practices, particularly in light of the complexities of the digital age and the development of modern financial transactions (Daraugemba et al., 2023). As fraud becomes increasingly sophisticated in both corporate and individual settings, and as financial and non-financial crimes expand, the demand for forensic accounting expertise is growing (Wang, Lee & Crumbley, 2016). Financial fraud is defined as the use of illegal means to obtain financial gain, although there is no universally agreed-upon definition (Hilal, Gadsden & Youni, 2022).

The research problem centers on the clear shortcomings of traditional auditing methods in addressing the increasing complexity and proliferation of financial crimes (such as fraud and money laundering) within the modern business environment, particularly in commercial banks. This problem arose due to weak regulatory and legal frameworks in many countries, particularly Iraq, coupled with a lack of training for accountants and auditors. This deficiency stems from the weakness of regulatory frameworks in many countries, along with a lack of training and awareness among auditors and accountants in accounting fields. This raises questions about the effectiveness of forensic accounting, through the use of data analysis techniques, in detecting financial crimes. To bridge this gap, it is necessary to provide robust financial evidence to assist judicial and regulatory authorities in effectively detecting and combating these crimes. The main objective of this research is to identify and define the role of

forensic accounting in data analysis for detecting financial crimes in commercial banks, by studying and measuring the relationship between forensic accounting and financial crimes. The importance of this research stems from the fact that forensic accounting is an important element in reducing the rampant financial crimes in economic units, including commercial banks. Forensic accounting contributes to uncovering unethical practices represented by administrative and financial corruption, fraud, and financial manipulation that have threatened many economic units and their stability and continuity. One of the importance of forensic accounting is that it combines skill and knowledge with the application of accounting principles and legal investigation in order to provide strong evidence in uncovering these practices. Forensic accounting also enhances trust and transparency in financial reports.

II. Lecture review

Forensic Accounting

Forensic accounting is a relatively new field that supports financial cases and helps uncover and combat corruption. It combines accounting skills, financial analysis, and legal investigation techniques. The need for this accounting specialization (forensic accounting) has become particularly pronounced after the collapse of numerous international companies due to widespread corruption and weak oversight and auditing mechanisms (Radwan et al., 2021: 903). Forensic accounting primarily utilizes Generally Accepted Accounting Principles (GAAP) and International Accounting Standards (IAS) to investigate discrepancies and financial fraud. It necessitates analyzing financial data to support legal proceedings, integrating accounting expertise and knowledge with investigative skills to uncover financial crimes. Forensic accounting focuses on using accounting knowledge and skills to identify financial misconduct within banks (Baroudia, 2025). Therefore, financial misconduct can be investigated and prosecuted, leading to lawsuits. Disclosing this type of misconduct can have a significant impact on financial markets (De Patz, 2020). Forensic accounting dates back to ancient civilizations, where it was used to uncover cases of corruption and financial fraud. This concept evolved during the Middle Ages as an advisory profession to kings and presidents, and in modern times, it has developed into an independent accounting discipline focused on detecting fraud and financial crimes (Devi, 2023). Forensic accounting is an effective tool for detecting and mitigating financial manipulation while promoting corporate governance. Therefore, this specialized field integrates accounting principles (GAAP, IFRS) with investigative methodologies for auditing financial statements, uncovering irregularities, and gathering evidence. The increased efforts to curb financial misconduct in India, particularly in the commercial and government sectors, have led to a growing demand for skilled forensic accountants (Parodia, 2024, p. 271).

The importance of forensic accounting has grown in recent years, as financial scandals have caused significant economic damage, leading to increased regulatory scrutiny and a higher demand for forensic accountants. Forensic accountants use a combination of accounting knowledge, legal expertise, and investigative methods to uncover hidden assets, identify financial discrepancies, and support legal proceedings when necessary. (Kansara, 2025, p. 282). It is also defined as a science that combines accounting, auditing, and investigation to uncover economic damages incurred by economic units as a result of fraud, deception, and financial corruption, and to provide opinions in legal investigations to support litigation (Sarhan, 2021). According to the American Institute of Certified Public Accountants (AICPA): "Forensic accounting is the application of accounting principles, theories, and disciplines to the facts or hypotheses in legal disputes, and encompasses all branches of accounting knowledge. "Forensic accounting, or criminal accounting, or financial forensics, is the specialized field of accounting practice that investigates whether companies are involved in financial reporting misconduct or financial misconduct within the workplace by employees, officers, or managers of the organization." (Barodiya, 2024, p. 273). Forensic accounting is defined as a specialized branch of accounting that aims to uncover fraud and financial corruption and contribute to the investigation of financial and legal disputes by employing in-depth accounting knowledge and meticulous financial analysis (Radwan et al, 909:2021).

Forensic accounting is similar to financial investigation, examining financial records to find evidence of fraud or other financial crimes. It combines accounting expertise with investigative skills to uncover hidden financial problems, such as embezzlement, or to identify financial discrepancies that may be part of a larger fraud scheme (Amahi, 2023). Forensic accounting is like a financial detective, investigating financial records to find evidence of fraud or other financial crimes. Forensic accounting is crucial for regulatory bodies responsible for detecting fraud and financial corruption. It is considered the optimal tool for these bodies to curb financial fraud practices. Therefore, it is essential to have legal frameworks that define the duties of forensic accountants in courts, financial institutions, and regulatory bodies (Kareem et al., 2022, p. 129). Recent developments in forensic accounting include the use of big data analytics and artificial intelligence-based tools to detect irregularities in financial statements. Blockchain technology is also emerging as a tool to ensure transaction transparency and prevent manipulation. In addition, forensic accountants collaborate with regulatory bodies and compliance teams in banks and insurance companies to enhance their efforts in detecting financial fraud in financial statements (Adigmo & Ogberi, 2025, p. 1219). Therefore, the application of forensic accounting is a crucial tool in

uncovering financial crimes such as manipulation and fraud, as it contributes to enhancing the transparency of financial data and reducing administrative and financial corruption prevalent in economic units. This highlights the role of forensic accounting in analyzing financial statements and reports to identify irregularities and strengthen cooperation with these economic units. With law enforcement agencies, fraud prevention can be achieved through the application of financial controls, based on a systematic review of the literature (**Asbe et al., 2025**). **Obaid's study (2022)** highlighted the shortcomings in integrating forensic accounting into Saudi university curricula, anticipating an increased demand for specialists and emphasizing the importance of offering specialized courses to equip graduates with the necessary skills. **Kaur et al. (2023)** noted that legal, ethical, and economic challenges have led global institutions to prioritize forensic accounting, advocating for its integration as an elective course in undergraduate and graduate programs to meet industry needs.

The importance of forensic accounting can be summarized as follows:

1. The importance of forensic accounting has increased following global economic collapses due to corruption and financial fraud, with a rise in economic cases before the courts (**Obaid, 2018**).
2. Forensic accounting is used in banks and insurance companies, representing an integration of accounting and law to support legal cases (**Nour, 2022**).
3. It is essential when traditional auditing is insufficient, as it combines accounting standards and investigative skills to provide legal evidence (**Fatih & Abdelghani, 2018**).
4. Continuous professional development is necessary to keep pace with financial complexities and the use of emerging technologies such as blockchain and artificial intelligence in combating financial crimes (**Zysman, 2020**).
5. Interest in forensic accounting has increased to address fraud and financial corruption in companies and to support specialized auditing services (**Mohammed Nour, 2018**).
6. Forensic accounting contributes to uncovering manipulation and fraud, enhancing confidence in financial reports, and protecting the rights of stakeholders (**Zinal et al., 2022; Rashid et al., 2022**).
7. A shift towards fraud prevention, employee training, and enhanced corporate governance is recommended, along with raising awareness and implementing effective fraud prevention policies (**Navaretti & Gallego, 2022; Kaur et al., 2022**).
8. Understanding the nature of financial manipulation and fraud is crucial for forensic accountants and auditors. The availability of modern technological tools and resources has enhanced their ability to detect and mitigate financial crimes (**Chiliatsido et al., 2022; Alfordi, 2022**).
9. With the rapid advancement and widespread adoption of technology, coupled with the increasing complexity of financial transactions, the detection of illicit activities has become more challenging. Consequently, forensic accountants play a vital role in uncovering such cases (**Dakhar, 2025**).

The application of forensic accounting in India has expanded due to increased awareness among accountants and auditors regarding the evolving nature of financial fraud and manipulation in financial statements. This awareness stems from the prevalence of administrative and financial corruption, highlighting their role in investigating financial irregularities and curbing financial manipulation and fraud within the framework of applicable laws and regulations (**Barodia, 2024**). The work of the forensic accountant has expanded to include banks and insurance companies, with the need to focus on estimating financial and non-financial damages in light of the application of transparency, compliance and strengthening governance. Forensic accounting uses modern electronic technologies, including big data, blockchain and cloud accounting, in investigating fraud and assessing risks to uncover financial violations.

Financial Crimes

Financial crimes, such as fraud, embezzlement, money laundering, and manipulation of financial statements, have become increasingly sophisticated, posing significant risks to economies, businesses, and individuals (**Hassan et al., 2024**). In the United Kingdom, the Financial Services and Markets Act 2000 (**FSMA**) defines financial crime as “any crime involving fraud or dishonesty; misconduct in the financial market or misuse of information relating thereto; or dealing with the proceeds of crime.” Some researchers and government institutions do not clearly distinguish between financial crime, financial abuse, and white-collar crime, using them interchangeably without any nuance. The increasing frequency of financial crime activities in the Nigerian banking sector, as well as globally, has necessitated the implementation of forensic accounting as a means to combat the rate of financial crimes that can lead to mismanagement and embezzlement in various financial institutions in Nigeria (**Teibowei, 2025**).

Beckett and Beckett (2002) define financial crime as “the use of deception to achieve illicit gains, usually involving breach of trust and concealment of some truth about the nature of the activities,” using the terms financial crime, white-collar crime, and fraud interchangeably. Financial crimes are illegal activities committed with the intent to accumulate wealth, either individually, collectively, or organizationally, thereby violating

existing legislation, accounting standards, and policies governing economic activities and the management of the banking industry (Ojaïdi, 2020). In line with the literature and practices of implementing bodies (such as the US Securities and Exchange Commission (SEC), the French Financial Markets Authority (AMF), and the UK Financial Conduct Authority (FCA), we define financial crimes committed by listed companies as the following offenses: insider trading, price manipulation, dissemination of false information, accounting fraud, and any breach of financial regulations (de Batz, 2020).

Reconstructed financial records are crucial evidence in courts for prosecuting financial crimes and recovering assets. Reconstructing these records is a complex task requiring a deep understanding of accounting principles and investigative techniques. A successful forensic accountant must collect incomplete or manipulated financial data to provide an accurate picture of financial activities, especially reports that are falsified, misleading, or intentionally destroyed (Paul, 2024). Financial crimes, therefore, encompass a wide range of illegal activities characterized by fraud and financial manipulation, including embezzlement, illicit enrichment, money laundering, and other unethical conduct (Nufield, 2023; Yamen et al., 2019; Hussein et al., 2024).

Classifying Financial Crimes

Identifying the types of financial crimes is an important topic that should be studied, especially in the academic field, due to its impact on the performance of economic units in general and banks in particular. It contributes to better categorization of certain forms of crime and creates the conditions necessary for finding effective ways to combat them. This is particularly important when it comes to financial crimes, given their social impact and the damage they inflict on the financial system as a whole. **Gotschalk (2010)** classified a wide range of financial crimes into four main categories (corruption, fraud, theft, and manipulation). While no justification was provided for choosing these four categories, modern types of financial crimes have been thoroughly reviewed. **Gotschalk's (2010)** classification of financial crimes:

1. Corruption: Bribery, extortion, and embezzlement
2. Fraud: Identity theft, mortgage fraud, and professional fraud
3. Theft: Cash theft and intellectual property fraud
4. Manipulation: Money laundering, cybercrime, bid rigging, and insider trading

The International Monetary Fund (IMF) (2001) interpreted financial crime in a relatively narrow sense, distinguishing between the two terms. It defined financial abuse as a broad concept. As a subcategory, "financial sector crimes" include financial institutions or financial markets, while "other financial crimes" encompass a range of illegal activities that cause financial losses. The remainder is defined as "other financial abuse." IMF Classification of Financial Crimes (2001)

1- Financial Sector Crimes: Money Laundering/Fraud/Tax Evasion/Oversight of Foreign Exchange Restrictions/Other

2- Other Financial Crimes: Sale of Fictitious Financial Instruments or Insurance Documents/Embezzlement/Tax Evasion/Market Manipulation/Other

3- Other Financial Abuse: Tax Evasion/Linked Lending/Market Manipulation/Other

The role of forensic accounting in data analysis to uncover financial crimes

The dramatic rise in financial crime and corruption globally has established forensic accounting as a vital and growing discipline in both academia and business. At its core, forensic accounting involves examining evidence related to ongoing or anticipated legal disputes. The term forensic accounting refers to its application within legal frameworks and adherence to the instructions governing its implementation, in order to protect the public assets of institutions (Baroudia, 2024, 271). Therefore, forensic accounting is a crucial tool for detecting or mitigating fraud, manipulation, and financial crimes, as it combines the accountant's knowledge and skill in financial analysis with legal expertise. It not only establishes the occurrence of financial crime and identifies perpetrators but also evaluates the resulting damages and provides financial evidence to support legal proceedings, making it an effective means of promoting integrity and transparency in the financial environment (Teibowei, 2025, p. 52). The field of forensic accounting is strengthened by enriching existing literature and laying the foundation for future investigations in the prevention of financial crime. As financial crimes evolve, forensic accounting is essential for maintaining financial integrity and mitigating fraud risks. **Hossain, 1; 2025)** The spread of corruption has led to the collapse of many large companies in numerous countries, as well as currency collapse, thus harming the economy and national security. Corruption takes many forms and methods, including money laundering, embezzlement, theft, bribery, fraud, abuse of power, deception, tax evasion, and lobbying. The urgent need for forensic accounting arose from the widespread and pervasive administrative and financial corruption in most economic units, leading to the emergence of forensic accounting and this need (Youssef, 2: 2023). He points out that financial fraud or manipulation is a deeply rooted historical phenomenon, not a recent development, and has significantly impacted global revenues and profits. This has created a need to activate auditing and forensic

accounting tools to mitigate this phenomenon. Although there is some overlap between their work, they differ in purpose. Auditing focuses on detecting fraud and identifying the perpetrator, while forensic accounting aims to assess its financial impact and verify claims through the analysis of financial evidence. This requires specialized skills and expertise in each field (Tikavicic & Damigan, 2021). The banking sector has witnessed a significant increase in illicit fraudulent activities, negatively impacting the performance and stability of banks, thus highlighting the necessity of applying forensic accounting to combat or reduce financial crimes. (Adebisiet et al., 2016) One of the most prominent issues is financial crimes in banks, which has received considerable attention from researchers and writers, especially given the limitations of traditional auditing. This has highlighted the need to activate forensic accounting as a specialized tool that contributes to uncovering financial crimes and prosecuting perpetrators by providing reliable information that can be used as legal evidence and enhancing the effectiveness of internal control systems (Cole, 2019). A study conducted by Ibrahim et al. demonstrated the importance of applying forensic accounting in uncovering financial crimes, including cases of fraud and financial manipulation in economic units. One of its most important findings was that forensic accounting plays a significant role in combating tax evasion by assisting tax authorities in accurately assessing the true tax base of taxpayers and reducing opportunities for deliberate tax evasion (Ibrahim et al., 2024:293). As a result of recent technological developments, the application of forensic accounting has evolved through the integration of data analysis, artificial intelligence tools, and blockchain technology to address and mitigate financial crimes. Modern forensic accountants utilize more sophisticated analytical tools to detect behavioral patterns of financial fraud (Durani et al., 2024).

A study by Hussein (2025) highlighted the importance of forensic accounting and its role in crime investigation, emphasizing its significance in identifying and mitigating various forms of financial fraud, such as money laundering, embezzlement, and manipulation of financial data. The study's findings revealed that while forensic accounting techniques are being employed to uncover financial crimes, significant shortcomings remain in the available tools, compounded by challenges including legal obstacles and high investigative costs. Forensic accounting plays a vital role in combating financial crimes stemming from accounting estimations. It combines specialized accounting knowledge with forensic investigation skills to analyze financial data and uncover manipulations. Through meticulous examination and forensic analysis of financial data, forensic accountants can detect any manipulation of figures or exaggeration of profits or losses (**Hashem, 2024: 388**). Forensic accounting refers to the application of analytical and investigative skills to resolve financial cases according to legal standards. It is used in supporting litigation, investigating financial crimes, and providing testimony and expertise before the courts (**Chen & Akkeren, 2021**). As **Emoniana et al. (2021)** explained, its services extend to include assessing economic damages, detecting financial and corporate fraud, analyzing digital data, discovering hidden assets, and resolving professional or marital disputes, making it an effective tool in combating financial crimes and protecting economic interests.

Traditional auditing and regulatory frameworks have proven inadequate in identifying and mitigating fraudulent activities, leading to the emergence of forensic accounting as a fundamental tool in financial crime investigations (**Dewayanto, 2023**). When a financial crime is declared against a listed company, that company is expected to experience abnormally low returns, reflecting the anticipated subsequent cumulative costs (fines, legal fees, compensation, increased business costs, reputational damage, etc.) (**de Batz, 2020**). Forensic accounting complements legal systems in combating financial crimes such as fraud, money laundering, and embezzlement, given their serious economic and social impacts. Forensic accountants play a crucial role in analyzing financial evidence by uncovering hidden assets and restructuring accounting records to comply with legal procedures. This relies on their expertise and skills, which contributes to reducing and preventing the spread of financial crimes (Chokwani, 2024). The forensic accountant investigates financial crimes in financial statements impartially and fairly, following evidentiary procedures based on the bank's regulations and laws, and analyzing the sources of incoming and outgoing funds (Zissman, 2001; Quinnin, 2005). The forensic accountant's responsibility includes preparing financial reports and providing necessary recommendations to prevent the recurrence of crimes. Bassin (2007) argues that the work of forensic accountants is not limited to preparing financial statements but extends to analyzing the bank's operations and uncovering various types of fraud and financial manipulation using digital and other modern technologies, and presenting this information to the judicial authorities. Therefore, modern forensic accounting techniques, such as big data analysis, financial modeling, and fraud detection, are considered important tools in reducing financial crimes. These techniques and methods not only help in detecting and preventing fraudulent activities but also in recovering assets lost due to the prevalence of financial crimes. Undoubtedly, cooperation between forensic and legal accountants contributes to reducing financial crimes by enhancing the knowledge and skills of both professions in identifying and mitigating such offenses (Maika et al., 2023). Forensic accountants utilize their accounting and auditing skills to detect fraudulent transactions and determine how to prevent or stop them. Fraud in financial transactions involves unauthorized transactions aimed at achieving illegal gains and benefits (Lawal, 2024). Therefore, forensic accountants meticulously analyze accounting records and reports, including accounts payable, accounts receivable, and inventory ledgers, to identify

illicit discrepancies. They employ various techniques to uncover these assets, such as financial statement analysis, bank statement audits, and tax return audits. The net worth method, upheld by the U.S. Supreme Court, is a common approach that calculates the difference between a person's net worth on two specific dates to identify unreported income or assets. This method helps forensic accountants track hidden assets and provide crucial evidence in legal proceedings (Shilts, 2018).

Al-Jubouri (2019:7) concluded in his study that the increasing number of administrative and financial corruption cases necessitates strengthening criminal accountability and updating the legislation governing the work of the Integrity Commission. The researcher recommended activating the role of the Commission as a primary investigative body in corruption cases by developing mechanisms for receiving reports and investigation procedures to ensure transparency and efficiency. He also called for the appointment of forensic accountants in Iraqi courts to support judges with accurate financial evidence, thereby contributing to achieving justice and enhancing the credibility of rulings, particularly in cases of a financial and accounting nature. Forensic accounting techniques, such as data analysis and fraud detection, are essential tools for combating financial crimes and recovering lost assets, and their integration into legal frameworks is becoming increasingly evident. Forensic accountants work in collaboration with legal professionals to ensure thorough investigations and the prosecution of perpetrators of financial crimes. Innovations in data and artificial intelligence contribute to enhancing the efficiency and accuracy of investigations, enabling the effective detection of complex financial schemes (Paul, 2024). Nigeria has enacted numerous laws to prevent, detect, and prosecute financial crimes, most notably the Anti-Money Laundering Act of 2011 and the Economic and Financial Crimes Act of 2004, which aim to prevent the laundering of proceeds of crime and ensure the investigation and prosecution of offenders (EFCC, 2023; Bello & Kuzmas, 2022). The legal framework also includes the Terrorism Financing Act of 2011 and the Corrupt Practices Act of 2000, as well as the Distressed Banks Act to ensure debt recovery and sound financial practices (Alogobi & Buniya, 2022; Atsegbua, 1997). The findings indicate that courts rely on external auditors and financial arbitrators to resolve financial disputes, while the use of creative accounting techniques in financial statements is limited, with the exception of the statement of changes in equity. It was also shown that investigation and evaluation procedures enhance the ability of the forensic accountant to confront creative accounting practices, with no statistically significant differences according to the type of auditing firms, and differences related to return on assets (Al-Kabbaji & Al-Jabri, 2022:2213).

The Applied Study of the Research

First: Description of the Research Sample

1- Research Sample: The research sample consisted of the 10 commercial banks registered on the Iraq Stock Exchange. More than 75 questionnaires were distributed, and 70 valid questionnaires were returned for statistical analysis. This analysis aimed to measure the feasibility of applying forensic accounting to data analysis and reduce financial crimes among a group of bank employees, namely accountants, auditors, cashiers, and department managers.

2- Sampling Method: The researcher used simple random sampling to distribute the questionnaires to the commercial bank employees, assuming a homogeneous or similar population. The sample size was 70 employees (accountants, auditors, cashiers, and department managers).

3- Statistical Indicators: The researcher analyzed the questionnaires using data and information obtained from the research, employing a five-point Likert scale (Agree, Strongly Agree, Neutral, Disagree, Strongly Disagree) in accordance with the research hypotheses. Note that these indicators were calculated using the SPSS version 20 statistical software package.

4- The following methods were used: (frequencies and percentages, weighted arithmetic mean, standard deviation, correlation coefficient, Pearson test, and F-regression coefficient).

Second: Statistical Results Related to the Characteristics of the Research Sample.

To determine the demographic and professional characteristics of the research sample, the questionnaire included a set of descriptive variables representing the respondents' general information, including: educational qualifications, work experience, and academic specialization. Tables (1-2-3) show the number of individuals in the sample (frequency distribution) and the percentage of these characteristics. This allows for a more accurate understanding of the research sample and its conformity with the research objectives and the required statistical analyses.

1- Academic Qualification

Table (1)

Academic Qualification	NO.	Ratio
PhD or equivalent	3	4%
Master's or equivalent	11	12%
Bachelor's	46	77%
Diploma	10	7%
Total	70	100%

Table (1) shows that the majority of the research sample held a bachelor's degree, numbering (46) individuals out of a total of (70) individuals, which is approximately 77% of the total sample. Those holding a doctorate constituted the smallest percentage, with only 3 respondents, representing 4% of the total sample. These results suggest that most of the sample possesses an educational level that enables them to understand the questionnaire content and engage with its questions effectively, thus enhancing the credibility and reliability of the responses obtained.

2- Years of Service

Table (2)

Years of Service	NO.	Ratio
Under 5 years old	12	17%
5 to under 10 years old	25	36%
10 to 15 years old	22	31%
Over 15 years old	11	16%
Total	70	100%

Table (2) shows that the largest percentage of respondents (22, representing approximately 37% of the total sample) have between 10 and 15 years of professional experience. It also shows that 15 respondents (25%) have between 3 and 10 years of experience, while those with between 15 and 20 years of experience comprise about 16% of the sample. These results indicate that the majority of respondents possess sufficient professional experience to understand the questionnaire content and respond to it objectively, thus enhancing the reliability of their answers and increasing the validity of the results in achieving the research objectives.

3-Scientific specialization

Table (3)

Scientific specialization	NO.	Ratio
Accounting	25	36%
Management	15	21%
Finance and Banking	20	29%
Other specializations	10	14%
Total	70	100%

Table (3) shows that the largest percentage of the sample belonged to the accounting specialization, with 25 respondents out of 70, representing 36% of the total sample. The remainder of the sample was distributed across other specializations, including management (21%), finance and banking (29%), and economics (14%). These results indicate that most of the sample possessed a specialized academic background in the field of accounting, along with an academic diversity that enriched the respondents' opinions and enhanced the comprehensiveness and reliability of the responses provided in the questionnaire. This confirmed the research findings in achieving the research through a precise and practical analysis of the variables.

Second: - Practical Statistics

First Axis: Forensic Accounting

Table (3)

Paragraph	I agree	I strongly agree	Neutral	Disagree	Strongly Disagree	SAM	Standard deviation	General trend
Activating forensic accounting significantly reduces the prevalence of bribery in institutions through the use of technology.	42%	18%	30%	10%	0%	2.2800	.53220	agree
Forensic accounting contributes to identifying cases of financial	23%	37%	23%	17%	0%	3.2900	.54224	agree

and administrative corruption and financial fraud.								
Forensic accounting helps bridge the gap between judges and accountants to achieve the necessary harmony and justice in resolving disputes.	26%	34%	18%	22%	0%	2.5199	.78264	agree
Forensic accounting contributes to supporting the work of internal and external oversight and investigative bodies.	30%	26%	28%	16%	0%	5.4220	.63800	agree
Weak academic and practical qualifications and experience affect the efficiency of a forensic accountant's performance.	34%	38%	20%	8%	0%	6.1900	.53120	agree
Insufficient continuous development of a forensic accountant's skills and knowledge affects their ability to detect fraud and financial crimes.	29%	27%	35%	9%	0%	5.4950	.45312	agree
A forensic accountant's keen observation, professional skepticism, and familiarity with accounting and auditing principles help them detect manipulation or financial fraud.	25%	35%	30%	10%	0%	1.3290	.35220	agree
A forensic accountant's commitment to confidentiality and non-disclosure of information is essential for their professional success.	20%	35%	22%	23%	0%	3.3900	.53114	agree
Relying on forensic accountants enhances the efficiency of investigations into financial fraud cases.	30%	25%	18%	27%	0%	2.4911	.75964	agree
Forensic accounting contributes to the early detection of financial crimes within organizations.	40%	35%	15%	10%	0%	3.2990	.43140	agree
Using data analysis techniques in forensic accounting helps uncover financial manipulation.	30%	35%	25%	10%	0%	3.4980	.75112	agree
Forensic accounting helps the judiciary provide accurate financial evidence that contributes to fair judgments.	40%	30%	18%	12%	0%	3.9110	.25210	agree
Having a dedicated forensic accounting department within an organization reduces the opportunities for financial crimes.	28%	32%	24%	16%	0%	2.2951	.53224	agree
Implementing forensic accounting standards contributes to enhanced transparency and financial disclosure.	35%	40%	20%	5%	0%	4.4911	.78064	agree

From Table (3), the statistical results showed that all items related to forensic accounting were positive, which reflects the existence of agreement among the members of the sample being researched on the necessity of activating forensic accounting in order to reduce financial crimes in commercial banks, as the percentage ranged between (1.3920-6.1900). While it was found that the standard deviation was low, this indicates a relative agreement among the members of the sample regarding the importance of forensic accounting. The detailed results point to several key aspects:

1. Forensic accounting is an effective tool in reducing financial crimes: Participants affirmed that activating forensic accounting reduces bribery and financial manipulation and enhances the early detection of financial crimes, especially when using modern technologies such as financial data analysis. This reflects that forensic accounting is not only a supervisory tool but also an effective means of preventing financial fraud before it occurs.
2. The professional skills and experience of forensic accountants affect performance efficiency: Statements related to keen observation, professional skepticism, familiarity with accounting and auditing aspects, and practical and academic experience showed high average scores, indicating that the individual competence of forensic accountants is a crucial factor in the success of their oversight role and the detection of financial crimes.

3. Institutional structure and adherence to standards enhance the effectiveness of forensic accounting: Statements related to the existence of a specialized forensic accounting department, adherence to confidentiality, application of forensic accounting standards, and the promotion of transparency and financial disclosure showed strong agreement, indicating that establishing a suitable institutional structure and following rigorous standards enhances the ability of forensic accounting to achieve tangible results in reducing financial crimes .The survey results indicate that forensic accounting plays a pivotal role in reducing financial crimes, whether through strengthening oversight and early detection of financial fraud, developing the skills and expertise of forensic accountants, or creating a suitable institutional environment and applying professional standards .Therefore, relying on forensic accounting represents a strategic tool for promoting integrity and financial transparency within institutions and reducing opportunities for financial crimes.

2- Financial Crimes

Table (5)

Paragraph	I agree	I strongly agree	Neutral	Disagree	Strongly Disagree	SAM	Standard deviation	General trend
Weak adherence to accounting disclosure and transparency standards is a major cause of financial crimes.	35%	37%	18%	10%	0%	3.3100	.52980	agree
The lack of due diligence on employees and suspicious transactions leads to an increase in financial crimes related to data.	25%	55%	10%	10%	0%	3.3200	.54424	agree
Using financial analysis tools for financial statements and identifying financial gaps helps reduce financial crimes related to data.	36%	40%	15%	9%	0%	2.4911	.76564	agree
The use of established accounting methods, including forensic accounting, helps reduce financial crimes.	30%	26%	32%	12%	0%	5.9220	.63800	agree
Compliance with regulations and laws issued by institutions is a method that reduces manipulation of financial statements (financial crimes).	42%	38%	9%	11%	0%	5.4980	.45112	agree
Adopting electronic accounting methods instead of traditional methods is one way to reduce financial crimes related to data.	39%	31%	25%	5%	0%	2.4101	.25010	agree
Financial crimes pose a real threat to the stability and continuity of commercial banks in light of intense competition.	30%	35%	21%	19%	0%	2.3100	.54124	agree
Weak or absent internal control systems in commercial banks contribute to the occurrence of financial crimes related to data or reports.	38%	28%	18%	16%	0%	4.5199	.77164	agree
Training accountants, auditors, and other employees in fraud detection methods is essential to reducing financial crimes.	29%	41%	17%	13%	0%	1.2411	.34220	agree
Financial crimes negatively impact a bank's reputation and investor confidence, as well as customer confidence.	40%	30%	18%	12%	0%	3.4200	.52224	agree
Using forensic accounting coupled with stricter administrative penalties helps reduce financial crimes.	42%	38%	12%	8%	0%	2.3199	.54994	agree

The results of the survey administered to the sample showed that all statements related to forensic accounting and the causes of financial crimes received a general trend of agreement, reflecting a relative consensus among respondents on the importance of forensic accounting and control tools in reducing financial crimes within commercial banks. The mean scores (SMA) ranged between 1.2411 and 6.1900, while the standard deviation was relatively low, indicating a relatively strong agreement among the sample on these issues. Key findings:

1. Forensic accounting is an effective tool in reducing financial crimes: Participants affirmed that implementing forensic accounting reduces bribery and financial manipulation and enhances the early detection of financial crimes, especially when using modern technologies such as financial data analysis and financial statement analysis tools. This reflects that forensic accounting is not only a control tool but also an effective means of preventing financial fraud before it occurs.
2. The professional skills and experience of the forensic accountant play a crucial role: Statements related to keen observation, professional skepticism, familiarity with accounting and auditing aspects, and practical and theoretical experience showed high average scores, indicating that the individual competence of the forensic accountant is a decisive factor in the success of their oversight role and the detection of financial crimes.
3. Adherence to standards, organizational structure, and training enhance the effectiveness of reducing financial crimes: The results showed that the presence of a specialized forensic accounting department, adherence to confidentiality, application of standards, training in fraud detection methods, and strong internal control systems all contribute to reducing opportunities for financial manipulation and ensuring the stability of financial institutions and investor confidence. The results also confirmed that weak adherence to transparency and accounting standards, and the absence of procedures for investigating suspicious transactions, are key factors in the increase of financial crimes.

Third; Statistical analysis of research variables

Table (6)

Details	Statistical Analysis Indicators	Interpretation
Observations	70	The sample consists of 70 observations or questionnaires, a suitable size for statistical analysis, which lends the results a good degree of reliability.
T-test coefficient (T)	4.690	The high t-value indicates that the regression coefficient is statistically significant, meaning that the independent variable (forensic accounting) has a clear effect on the dependent variable (reducing financial crime).
ANOVA coefficient (F)	9.980	The F-value indicates that the statistical model as a whole is significant, meaning that the independent variables (forensic accounting) collectively explain a significant amount of the variance in the dependent variable (reducing financial crime).
Regression coefficient	2.310	This indicates that every one-unit increase in the independent variable (forensic accounting) leads to a 2.31-unit increase in the dependent variable (reduction of financial crimes), reflecting a strong positive effect.
Correlation coefficient (R)	0.890	A very high value (close to 1) indicates a strong and positive correlation between the independent variable (forensic accounting) and the dependent variable (reducing financial crimes).
Significance level	0.000	It is less than 0.05, which means that the results are very statistically significant, and therefore the null hypothesis (no effect) can be rejected and the alternative hypothesis (significant effect) accepted.

Based on the results in Table 6, it can be concluded that the statistical model used possesses high explanatory power and significance. The results showed a strong positive correlation ($R = 0.890$) between the variables under study, and that the model as a whole is statistically significant ($F = 9.980$, $\text{Sig.} = 0.000$). Furthermore, the positive regression coefficient ($B = 2.310$) confirms that increasing the independent variable (forensic accounting) leads to a significant increase in the dependent variable (reducing financial crimes). Based on the t-test value ($T = 4.690$), the effect of the independent variable (forensic accounting) is real and highly significant, and not a result of statistical chance.

Table (7)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.890 ^a	.452	.433	.28585

a. Predictors: (Constant), forensic accounting.

The results of the linear regression analysis showed a correlation coefficient (R) of 0.890, a very high value indicating a strong and positive correlation between the application of forensic accounting and the reduction of financial crimes. This means that a higher level of forensic accounting application contributes significantly to reducing financial crimes within organizations. The coefficient of determination (R^2) was 0.452, meaning that the

regression model explains 45.2% of the variation in the level of financial crime reduction through the forensic accounting variable, while the remaining 54.8% is attributed to other factors not included in the statistical model. The adjusted coefficient of determination (R^2) was 0.433, close to the original coefficient, indicating that the model has good explanatory power even after considering the sample size and number of variables. The standard error of the estimate was approximately 0.28585, a relatively low value reflecting the accuracy of the statistical model and its high predictive power regarding the actual levels of financial crime reduction. The results show that forensic accounting is one of the essential factors in reducing financial crimes, as it contributes significantly to explaining changes in this variable, which confirms the importance of adopting forensic accounting practices in institutions as an effective means of control and early detection of illegal activities.

Table (8)

Analysis of Variance Test: The Role of Forensic Accounting in Data Analysis to Reduce Financial Crimes

ANOVA ^a					
Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	3.907	2	1.954	9.980	.000 ^b
Residual	4.739	68	.082		
Total	8.647	70			

a. Dependent Variable: Reducing financial crimes

b. Predictors: (Constant), Forensic accounting

Table (8) shows that the F-statistic was 9.980, with a degree of freedom (df) of 2.68 and a significance level of 0.000, which is significantly lower than the target significance level of 0.05. This indicates that the statistical model as a whole is significant, meaning that forensic accounting has a statistically significant effect on reducing financial crimes. The sum of squares (SMS) of the explained variance was approximately 3.907 out of a total variance of 8.647, indicating that a large proportion of the variance in the dependent variable can be explained by the independent variable (forensic accounting). Conversely, the residual SMS was 4.739, representing the portion of the variance attributable to other factors not included in the model. The results of the analysis of variance indicate that the regression model used has high statistical significance, meaning that forensic accounting effectively contributes to reducing financial crimes. The high value of $F = 9.980$ confirms that the differences between expected and actual values are not due to chance, but rather to a real effect of forensic accounting. Therefore, it can be concluded that applying forensic accounting principles is a crucial element in reducing opportunities for financial crimes by enhancing transparency and early detection of irregularities. In conclusion, the ANOVA results demonstrate that the statistical model has strong explanatory power and significant significance, and that forensic accounting has a highly significant effect on reducing financial crimes, thus supporting the hypothesis of a positive and significant relationship between the two variables.

Table (9)

Testing beta values, t-coefficient, and significance (sig.) of the impact of forensic accounting on reducing financial crimes

Coefficients ^a					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	2.310	.474		2.269	.027
Forensic accounting	.520	.133	.472	3.913	.000

a. Dependent Variable: Reducing financial crimes

The table shows that the value of the constant was 2.310, with a significance level ($\text{Sig.} = 0.027$), which is less than 0.05. This indicates that the constant has a significant effect on the model, meaning there is an initial level of reduction in financial crimes even in the absence of the effect of the independent variable (forensic accounting). The non-standardized regression coefficient (B) for the forensic accounting variable was 0.520, with a significance level ($\text{Sig.} = 0.000$), which is less than 0.05. This means that forensic accounting has a positive and statistically significant effect on reducing financial crimes. This can be explained by the fact that when the level of application of forensic accounting increases by one unit, the level of reduction in financial crimes increases by 0.520 units, holding other factors constant. The t-test value for the independent variable was 3.913, a high value indicating that the effect of forensic accounting in the model is real and significant, and not due to chance. The standardized coefficient The Beta value (Δ) reached 0.472, indicating that forensic accounting contributes 47.2% to explaining the change in reducing financial crimes when compared to the impact of other variables in the presence of more than one independent variable. The results clearly indicate a positive and significant relationship

between forensic accounting and the reduction of financial crimes; that is, promoting the application of forensic accounting tools and methods leads to a tangible decrease in financial crime rates.

This underscores the vital role of forensic accounting in detecting financial manipulation, improving control systems, and increasing transparency in financial reporting. The results demonstrate that forensic accounting has a positive and significant impact on reducing financial crimes, and that the statistical model is highly significant, as all analytical indicators (R, F, t, Sig) showed strong significance, confirming the hypothesis that the application of forensic accounting contributes to reducing financial crimes within commercial banks.

Statistical Analysis of the Impact of Forensic Accounting on Reducing Financial Crimes

The results of the simple linear regression analysis showed a correlation coefficient (R) of 0.890, indicating a strong and positive correlation between forensic accounting and the reduction of financial crimes. This means that a higher level of forensic accounting application leads to greater effectiveness in reducing financial crimes within institutions. The coefficient of determination (R^2) was 0.452, meaning that the regression model explains 45.2% of the variation in the level of financial crime reduction through the forensic accounting variable, while the remaining percentage is attributed to other factors not included in the model. The adjusted coefficient of determination (R^2) was 0.433, demonstrating the model's strong explanatory power even after adjusting for the number of variables and sample size. The standard error of estimation (Std. Error) was 0.28585, a relatively low value indicating the statistical model's accuracy in prediction. The results of the analysis of variance (ANOVA) showed an F-statistic of 9.980 with a significance level of 0.000 (Sig. = 0.05), indicating that the statistical model as a whole is highly significant. This suggests that forensic accounting has a significant and clear impact on explaining changes in the reduction of financial crimes. This result indicates that the differences in the level of reduction of financial crimes between expected and actual values are not due to chance, but rather to a real effect of forensic accounting.

As for the results of the regression coefficients, the constant value was 2.310, which is significant at 0.027, indicating a baseline level of reduction in financial crimes even in the absence of the effect of the independent variable. The non-standardized regression coefficient (B) for the forensic accounting variable was 0.520, with a significance level (Sig. = 0.000) and a t-value of 3.913, indicating a significant effect. The standardized value (Beta) was 0.472, meaning that forensic accounting contributes 47.2% to explaining changes in the reduction of financial crimes. These results suggest that every one-unit increase in the application of forensic accounting leads to a 0.520-unit increase in the level of reduction of financial crimes.

III. Conclusions and Recommendations

First:- conclusions

- 1- There is a consensus among the sample group on the pivotal and vital role of forensic accounting in reducing financial crimes (such as fraud, embezzlement, and money laundering) and its effectiveness in enhancing oversight and increasing financial integrity.
- 2- Forensic accounting methods are no longer considered merely a control tool, but rather an effective tool for detecting and preventing financial manipulation and fraud before they occur, especially when using modern financial analysis techniques.
- 3- Forensic accounting has become a tool to support governmental bodies, including the judiciary, courts, and various regulatory agencies, by providing modern financial tools to ensure fair and impartial judgments.
- 4- The applied study found a strong positive correlation and impact between forensic accounting and data analysis in reducing financial crimes, with a correlation coefficient of 0.890 (R value).
- 5- The statistical results of the regression analysis of forensic accounting explained 43.3% of the variance in financial crimes, with an adjusted correlation coefficient of 0.433. This demonstrates that the adopted statistical model possesses a strong and accurate explanatory power in predict in financial crimes.
- 6- It was found that there is an agreement among the research sample that traditional accounting and auditing methods are no longer effective or sufficient in reducing financial crimes, which highlights the need to use modern techniques in detecting fraud and financial manipulation.

Second: -Recommendations

- 1- Commercial banks are recommended to strategically adopt forensic accounting by establishing independent organizational units, reporting to the board of directors or the audit committee, dedicated to investigating financial irregularities and analyzing data to uncover crimes.
- 2- Banks should invest in advanced technology, including Big Data Analytics and Artificial Intelligence (AI), as essential tools for forensic accountants. This will enable them to process massive amounts of financial data and identify anomalies.

3- Continuous and specialized professional development and training programs should be implemented, offering professional certifications in forensic accounting. This will ensure that accountants and auditors possess the dual skills (accounting and legal) necessary for effective investigation.

4- Banks should work to re-engineer and strengthen their internal control systems, implement strict policies regarding financial disclosure and transparency to minimize loopholes exploited by financial criminals, and adhere to relevant international standards.

5- Activating cooperation with legislative and judicial bodies: Professional bodies and legislative authorities should work to develop the legal and legislative framework for accepting and documenting evidence obtained from the work of forensic accountants, and facilitate cooperation mechanisms between them and the Public Prosecution and the judiciary to ensure the effectiveness of legal procedures.

6- Integrating forensic accounting into academic curricula: Higher education institutions are recommended to include and develop specialized courses in forensic accounting and data analysis within the fields of accounting, finance, and law, to bridge the gap between educational outcomes and the growing needs of the labor market in this field.

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