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An Empirical Analysis of The Impact of Banking Fraud on the Corporate Finanacial Performance of Quoted Banks on the Nigerian Stock Exchange

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Abstract: *This study investigated the relationship between Banking frauds and Corporate financial performance of quoted banks on the Nigerian Stock Exchange. Automated teller machine fraud, mobile phone banking fraud and point of sale fraud were Banking fraud proxies while revenue growth and return on investment were the proxies of financial performance. The researchers adopted ex post- facto research design for the study. The study used relevant secondary data obtained from Nigerian Electronic Fraud Forum, Nigeria Deposit Insurance Corporation, and Central Bank of Nigeria (CBN) from 2013 to 2017. The data was analyzed using basic descriptive statistic, Pearson product moment correlation and multivariate regression with econometric analyses like Unit roots, granger causality test and cointegration test via E-view 9. The results showed positive but insignificant relationship between electronic fraud channels and financial performance variables. The study concluded that there is no significant relationship between the electronic fraud and financial performance of quoted commercial banks in Nigeria in the period of this study. We recommend sophisticated technology, improved collaborations between banks and CBN via NeFF to curtail unabated electronic frauds and leverage on the Bank Verification Number platform to improve security of transactions on electronic banking channels through biometric authentication.*

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I. INTRODUCTION

1.1 Background to the Study

The reward attributable to the stakeholders of any business setting is a function of sound financial performance which showcases the real value of the entity for the purpose of maximizing the stakeholders' wealth (Abubakar & Ofurum, 2018). Financial performance is the measurement of the results of an economic entity's policies and operations in monetary terms with a view to ascertain its overall financial health over a given time frame (Gaspareto, 2004). The financial performance is normally announced through periodic published financial statements and it is targeted at producing complete and reliable information to assist the users to take informed investment decision. It can also be used to compare similar firms across the same industry or to compare industries or sectors in aggregation. Pimentel, Braga and Casanova, (2005) maintained that economic success of any entity is determined by the magnitude of the financial performance. The import is that financial performance is thus crucial to any business organizational survival and continues patronage by the stakeholders in the business world particularly banks.

Banks occupy a significant place in the economy of every nation as the prime movers of its economic life. The success of commercial banks is very crucial to any economy. The Nigerian banking sector is undoubtedly the most important in the political-economic systems; because, it provides the necessary lubricant that keeps the wheel of the economy moving and it is an engine for economic growth. Financial performance of banks evolved from traditional banking with its attendance low returns to the modern electronic banking in the global world.

Before the emergence of modern banking system, banking operation was manually done, and that solely accounts for the inefficiency in handling transactions. This manual system involves posting of

transactions from one ledger to another without the aid of computer systems. Computations which should be done through computer or electronic machines were done manually, which sometimes lead to miscalculation due to human errors and consequently results in extension of closing hours when account is not balanced on time (Siyanbola, 2013). Customers had to queue up and spend more hours to talk to a teller to make their transactions. Inconveniences caused by these long queues discourage most customers who sometimes renegade from the queues in annoyance. For many years, bankers, IT experts, entrepreneurs and others have advocated for the replacement of physical cash and the introduction of more flexible, efficient and cost effective retail payment solutions (Siyanbola, 2013). Traditional banking system was often characterized by delay and inefficiency in the delivery of financial services which led to introduction of electronic banking.

Technical Committee on e-banking (CBN, 2003) defines e-banking as a means whereby banking business is transacted using automated processes and electronic devices such as personal computers, telephones, facsimiles, Internet, card payments and other electronic channels. Electronic banking is the use of electronic and telecommunication networks to deliver a wide range of value added products and services to bank customers (Steven, 2002). The use of information technology in banking operations is called electronic banking. Ovia, (2001) argues that electronic banking is a product of e-commerce in the field of banking and financial services.

Delgado (2004) describes e-banking as the provision of banking services to customers through the internet.

Electronic banking is defined to include the provision of retail and small value banking products and services through electronic channels as well as a large value electronic payment and other wholesale banking services delivered electronically. Alsmadi and Alwabel (2011) expressed that the definition of electronic banking varies among researchers partially because electronic banking refers to several types of services through which bank customers can request information and carry out banking services. Almost all banks in Nigeria offer online, real-time banking services. Banks that are not able to brace up to this new development are rapidly losing their customers and this leads to sluggish financial performance. Online, real-time banking system has now become commonplace as customers are offered the ease of operating an account in any branch of their bank's network.

The world has witnessed unprecedented upsurge of electronic payment instruments meant to facilitate trade and simplify payments. Electronic banking has experienced explosive growth and has transformed traditional practices in banking (Gonzalez, 2008). The heightened activity in payments has been largely attributed to four major shifts being observed in the global payments landscape. First, the ongoing digital and technology revolution, championed by the smartphones and mobile internet has revolutionized digital payments; next, the entry of non-bank institutions (like Google, PayPal, and Worldpay) offering payment services and products; third, customers (consumers and merchants) are becoming more demanding and expect instant payment solutions; fourth and finally, progressive changes in the regulatory framework. These four factors have given rise to a burgeoning industry recording three trillion transactions per year globally, worth around US$ 13 trillion in aggregate. Although non-cash and non-cheque payment solutions were made available relatively recently in Nigeria, in comparison with the Western world, the pace of growth of the payments industry in the country has been remarkable.

The World Bank Global Payments Systems Survey reports that the number of cards (debit and credit cards) grew from 4.7 million in 2010 to nearly 34 million in 2015. The number of mobile money accounts in the country grew from zero to 10 million in the same period, representing a Compound Annual Growth Rate (CAGR) of 49% and 27% respectively. Electronic banking which is also known as internet banking or e-banking has rapidly grown in the recent past years and offers variety of banking services which include electronic transfer of funds (EFT), automated teller machine, (ATM) services and direct deposits automatic bill payment and point on sales (POS). Nigeria banking sector particularly commercial has witnessed huge transformation in the last few years. Customers of banks now receive quick and improved services from their banks. Also, the use of automated teller machines (ATMs), internet and mobile banking facilities have decongested the banking halls of most banks in Nigeria thereby saving a lot of man hours. Besides, customers can also obtain banking services from the comfort of their homes. This is as a result of the deep competitive pressure, which arises from changes in the financial environment, technological advancements and the needs of the consumers in terms of product quality. This development improves the financial performance of banks as different internet products developed by banks generate tremendous income from the services delivered to customers.

In recent times however, the stakeholders have been worried over the apparent wave of electronic fraud ravaging the banking world. This worrisome phenomenon is concretized from the daily increase of attacks on the banks online products resulting to loss of hug amount of money in the banks. Nigeria electronic fraud forum

(NeFF, 2015) defines electronic fraud can as online trickery and deception which affects the entire society, impacting upon individuals, businesses and governments.

Electronic fraud is a major challenge to the entire banking industry and no bank is immune to it in all facets of global banking operations (Olorunsegun, 2010). Nearly 45 percent of the 141 million adults in America pay their bills online (Garter, 2004). Banks also enjoy providing the option of online banking because they can save on operating costs. However, during the popularization of online banking, nearly two million Americans suffered from fraudulent bank activity in 2004. Consumers reported an average loss of $1, 200 per bank fraud. Most market researchers attributed the increase in the number of bank frauds to online banking (Apostolou, Hassell and Webber, 2001). The Brazilian Banks Federation (Febraban) recently released data from a survey revealing that losses caused by electronic fraud are on the rise. These losses totaled R$ 685 million (US$ 460 million) from January to June this year, up from R$ 504 million (US$ 340 million) for the same period last year. That's an increase of 36% (Coffin, 2009).

With this surge in adoption and usage of payment systems, there has been a rise in the incidence of fraud in the Nigerian payments landscape. Of the nearly 44 trillion Naira in payments made across Nigeria in 2014, over 7 billion Naira was reported as the value of 6 "attempted" fraud and 6.22 billion Naira was the actual loss value reported . The Nigeria Inter-Bank Settlement System Plc (NIBSS) report also shows that in the same year, Automated Teller Machine (ATM) fraud was the most attempted with 491 incidents and Internet Banking recorded the highest fraud value of 3.2 billion Naira. The volume of fraud reported in 2016 compared to previous years attest to the fact that fraudsters do not grow weary. Nigeria electronic fraud forum (NeFF, 2015) states that the more products and services that are rolled out without proper risk and impact analysis, the easier for the "bad guys" to perpetrate more fraud effortlessly online. The determination and commitment of these unscrupulous elements cannot be underrated within the financial sector. Banking fraud is a problem to various stakeholders (shareholders, employees, customers and family members) etc. Precisely, it diminishes the financial performance of the banks leading to low dividends payment to shareholders. In the extreme case, it may threaten the going concern of the commercial bank and this may impact negatively on shareholder wealth. Odi (2013) acknowledges that fraud in banks shakes the foundation and credibility of most banks in Nigeria, resulting to some of the banks being distressed as a result of hug financial losses. This continuous increase in the electronic fraudulent attack has negatively reduced customers trust in the ability of bank to protect them. Bank customers/depositors and other stakeholders are now worried about the safety of their money and information and are expecting the bank to find a solution that can protect them and the economy as a whole. Hence, this study focused on the empirical relationship between electronic fraud and financial performance of Nigerian quoted banks.

1.2 Statement of the Problem

The aspiration of banks and other entities in the business world to have sound financial health is crucial to achieving its corporate mission and vision. This dream was boosted with the introduction of electronic banking platforms that herald the use of automated teller machine (ATM), point of sales (POS), mobile banking, electronic funds transfer (EFT), and internet banking etc. Siyanbola (2013) states that before the emergence of modern banking system, banking operation was manually done, and that solely accounts for the inefficiency in handling transactions leading to poor financial performance. The traditional banking system was often characterized by delay and ineptitude in the delivery of financial services which led to introduction of electronic banking. This development improves the financial performance of banks as different internet products developed by banks generate tremendous income from the services delivered to customers. Banks have experienced explosive financial performance through electronic banking and have transformed traditional practices in banking (Gonzalez, 2008). However, the euphoria of having enhanced financial performance of banks has been dangling and threatened in recent time due to the tsunami wave of electronic fraud in the banking industry. Electronic fraud is a major challenge to the entire banking industry and no bank is immune to it in all facets of global banking operations (Olorunsegun, 2010). With this surge in adoption and usage of payment systems, there has been a rise in the incidence of fraud in the Nigerian payments landscape. Of the nearly 44 trillion Naira payments made across Nigeria in 2014, over 7 billion Naira was reported as the value of 6 "attempted" fraud and 6.22 billion Naira was the actual loss value reported. The Nigeria Inter-Bank Settlement System Plc (NIBSS) report also shows that in the same year, ATM fraud was the most attempted with 491 incidents and Internet Banking recorded the highest fraud value of 3.2 billion Naira. The volume of fraud reported in 2016 compared to previous years attest to the fact that fraudsters do not grow weary.

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Several empirical studies exist from the Western and Asian world on e-banking and its impact on bank performance. For example, Furst, Lang and Nolle (2000), Hasan, Maccario and Zazzara (2002), Yibin (2003), Hasan, Zazzara and Ciciretti (2005), Hernado and Nieto (2006), De Young, Lang and Nolle (2007) and Ciciretti, Hansan and Zazzara, (2009) all dealt with general fraud and financial performance; Delgado, Hernando and Nieto (2004) and AL-Samadi et al. (2011) investigated on the impact of fraud on banks performance.

In Nigeria, there have been similar studies on the impact of fraud on banks by scholars like Kanu and Okoroafor (2013), Aruomoaghe and Ikyume (2013), Owolabi (2010), Uche and Agbo (2013), Ikpefan (2006) and Odi (2013). While most of them looked at it from the number and classes of staff involved, others looked at the relationship of the fraud with dividend, credit mobilization and so on. Moreso, another thread of scholars that focused on the factors influencing or exacerbating the occurrence of fraud include, (Akindele, 2011); (Chi-Chi & Ebimobowei, 2012), Famous and Okoeguale (2012), (Odi 2013), (Idowu, 2009), (Nwaze, 2006), (Ovuakporie, 1994), (Ogunleye, 2010), and Sergius & James (2018). However, none of these studies searched light on electronic fraud and financial performance of Nigerian banks.

Considering the adverse consequences of electronic fraud on the corporate financial performance, this research study is embarked on to address these identified problems inherent in banking industry. Hence, this study provided empirical study on the relationship between electronic banking fraud and financial performance of quoted Nigerian banks.

1.3 Aim and Objectives of the Study

The main aim of this research is to empirically examine the relationship between electronic banking fraud and financial performance of quoted commercial banks in Nigeria. However, this study is anchored on the following objectives.

i. Examine the relationship between automatic teller machine fraud and revenue growth of quoted commercial banks in Nigeria.
ii. Evaluate the relationship between point on sales fraud and revenue growth of quoted commercial banks in Nigeria.
iii. Investigate the relationship between electronic funds transfer fraud and revenue growth of quoted commercial banks in Nigeria.
iv. Ascertain the relationship between automatic teller machine fraud and return on investment of quoted commercial banks in Nigeria.
v. Find out the relationship between point of sales fraud and return on investment of quoted commercial banks in Nigeria.
vi. Assess the relationship between electronic funds transfer fraud and return on investment of quoted commercial banks in Nigeria.

1.4 Research Questions

In line with the above stated problems and the objectives of this study, the following research questions directed the empirical investigation of the research work.

(i) What is the relationship between automatic teller machine fraud and revenue growth of quoted commercial banks in Nigeria?
(ii). What is the relationship between point on sales fraud and revenue growth of quoted commercial banks in Nigeria?
(iii). What is the relationship between electronic funds transfer fraud and revenue growth of quoted commercial banks in Nigeria?
(iv). What is the relationship between automatic teller machine fraud and return on investment of quoted commercial banks in Nigeria?
(v). What is the relationship between point on sales fraud and return on investment of quoted commercial banks in Nigeria?
(vi). What is the relationship between electronic funds transfer fraud and return on investment of quoted commercial banks in Nigeria?

1.5 Hypotheses

To achieve the stated objectives and answer the research questions above empirically, the following hypotheses below were formulated:

$H0_1$: There is no significant relationship between automatic teller machine fraud and revenue growth of quoted commercial banks in Nigeria.

$H0_2$: There is no significant relationship between point on sale fraud and revenue growth of quoted commercial banks in Nigeria.

$H0_3$: There is no significant relationship between electronic funds transfer fraud and revenue growth of quoted commercial banks in Nigeria.

$H0_4$: There is no significant relationship between automatic teller machine fraud and return on investment of quoted commercial banks in Nigeria.

$H0_5$: There is no significant relationship between point on sale fraud and return on investment of quoted commercial banks in Nigeria.

$H0_6$: There is no significant relationship between electronic funds transfer fraud and return on investment of quoted commercial banks in Nigeria.

1.6 Scope of the Study

The scope of this study consists of content, geographical and unit of analysis as follows:

Content: This covers electronic fraud and financial performance of quoted commercial banks in Nigeria.

Geographical: The study covers quoted commercial banks in Nigeria from 2013 - 2017. The reason to study this period is based on the availability of data after the Central Bank of Nigeria established the Nigeria electronic fraud forum (NeFF) in 2012.

Unit of Analysis: This is based on organization at macroeconomic level.

II. LITERATURE REVIEW

2.1 Theoretical Framework

Theories are an essential part of the framework used to organize specific phenomena within the management and social sciences. A Theory provides a point of direction for evaluating the unknown in a defined area. From the above, we posit that a theoretical framework guides the research, determining what variables will be measured and what statistical relationships between the variables. Several theories provide insight into the phenomenon of fraud and financial performance. These include: Fraud Triangle theory, Fraud diamond theory, Differential association theory, Work place Deviance theory, Anomie theory of fraud, Differential Opportunity theory, Cognitive theory and so on. We shall look at some of the theories we considered most relevant to our work and latter anchor this research on the fraud diamond theory.

2.1.1 Fraud Triangle Theory

Cressey (1971) postulated the theory of fraud triangle. He observed that fraud is likely to occur given a combination of three factors; namely- Pressure (Motivation), Opportunity and Rationalization.

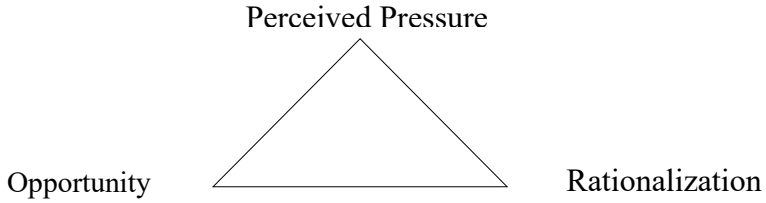


Fig. 1 Fraud Triangle

Pressure here refers to needs or desires that have to be satisfied. It could be divided into financial pressure, vices, work-related pressure and other pressures (Adeniji, 2012). Opportunity to commit fraud, conceal the fraud or avoid being punished forms the second element of the fraud triangle. The third element is rationalization which entails giving unnecessary explanation(s) to justify one's involvement in fraud. There exists pressure, motivation or compulsion on the fraudster who identifies opportunity which he utilizes and tries to justify his actions by unnecessary rationalization.

2.1.2 Fraud Diamond Theory

Kanu and Okorafor (2013) stated that Wolfe and Hermerson in 2004 postulated the fraud diamond theory. Fraud diamond added a fourth dimension to fraud triangle where it states that an individual's capability, personality trait and abilities can play a major role in determination of fraud occurrence.

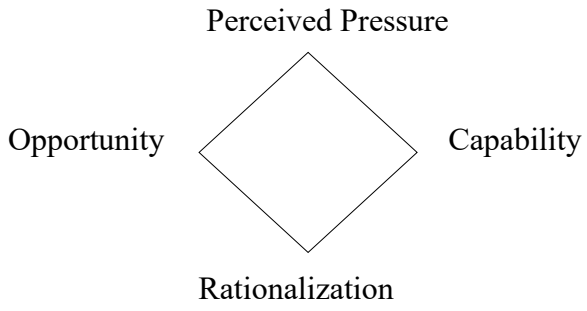


Fig.1 Fraud Diamond

Despite the existence of opportunity, with pressure and rationalization as attracting forces to it, individual's trait and ability to recognize the opportunity and perpetrate the fraud were other essential factors for fraud to occur. Wolfe and Hermanson (2004) maintained that opportunity opens the doorway to fraud, and incentive (i.e. pressure) and rationalization lead a person toward the door. However, capability enables the person to recognize the open doorway as an opportunity and to take advantage of it by walking through repeatedly. This is the situation of having the necessary traits or skills and abilities for the person to commit fraud. It is where the fraudster recognised the particular fraud opportunity and ability to turn it into reality. Position, intelligence, ego, coercion, deceit and stress, are the supporting elements of capability (Wolfe and Hermanson 2004). Mackevicius and Giriunas (2013) opined that not every person who possessed motivation, opportunities, and realization may commit fraud due to the lack of the capability to carry it out or to conceal it.

2.1.3 Work Place Deviance Theory

Comer (1985) put forward this theory in addition to others namely; differential opportunity, theory of concealment, and theory of minimum and general collusion. He believes that fraud is a deviant behaviour. Deviance theory postulates that employees steal primarily as a result of the conditions of the work place. It adds that a lower rate of employee theft is a by-product of management responsiveness to the employee's affairs. The fraud is akin to paying back evil for evil as employees pay back assumed injustice with fraudulent activities. Banks being institutions where the object of trade is money requires good management, internal control, updated equipment, adequate remuneration and high security. Good management is essentially good and bad conducts within a corporate organisation is infectious. This implies that bad attitude (like fraud) as well as good conducts by supervisors and top management in corporate organisations could be easily emulated. The nature of banking business where the object of trade is money itself makes it special as much effort is made on fraud prevention. This is because fraud in banks affects the transactions directly, has psychological effects on the depositors as regards safety of their deposits.

The ripple effect of reporting fraud in banks is the cause of under reporting of frauds in the industry. Good corporate governance becomes the key to lock the elements in fraud diamond such that they might be like a thought inside the box (Okoye, 2016).

2.1.4 Technology Acceptance Model (TAM)

Existing Literatures have accepted the technology acceptance model (TAM), proposed by Davis, Bagozzi and Warshaw (1989) as one of the most utilized models in studying information system acceptance (Mathieson, 1991; Venkatesh and Davis., 1996; Gefen and Straub, 2000). Technology Acceptance Model is based on two beliefs, namely: perceived ease of use and perceived Usefulness. Davis *et. al*. (1989) defined perceived usefulness (PU), as the degree to which a person believes that using a particular system would enhance his or her job performance. He also defined perceived ease of use (PEOU) as 'the degree to which a person believes that using a particular system would be free of effort,' in terms of physical and mental effort as well

as ease of learning. These two beliefs, according to TAM, determine one's intention to use technology. System acceptance will suffer if users do not perceive a system as useful and easy to use. TAM has emerged as a salient and powerful model that can be used to predict potential information system usage by measuring users' beliefs after they are exposed to the system even for a short period of time through training, prototype or mock-up models (Venkatesh & Davis, 1996). Davis *et al*. (1989) result indicated that while ease of use is clearly significant, usefulness is even more important in determining user acceptance. The TAM has been tested widely

with different situations and proved to be a valid and reliable model in explaining information system acceptance and usage (Mathieson, 1991; Venkatesh & Davis, 1996).

2.2 Corporate Financial Performance

The concept of Corporate financial performance and research into its measurement is well advanced within finance and management fields. An array of performance indicators is necessary to expose the different aspects of the performance of a bank as in Gibson and Cassar (2005). Watson (2007) defines performance as how well a company uses its recourses from its primary mode of business and generates revenues. Performance can also be defined as the accomplishment of specified business objectives measured against known standards, completeness and cost (Davis & Cobb, 2010). Generally, performance relates to the realization of organisational goals and objectives with minimum resources. Ross, Westerfield and Jordan (2008) opined that achieving good financial results is therefore a key objective of any economic entity.

Assessment of financial performance is primarily based on various methods of financial analysis. Various researchers have used different measures to capture organizational performance including net income, sales (Dollinger, 1984), Return on investments (ROI), Return on sales (ROS), and a combination of ROI and ROS (Pegels and Yang, 2000), return on assets (ROA) (Birley and Wiersema, 2000) and market to book value of the equity as well as profitability and market share/growth (Entrialgo et al. 2000). Gill (1990) measures a firm's financial performance by its liquidity which is the amount of cash a company can put its hands on quickly to settle its debts. Liquidity funds consist of cash, short term investment for which there is a ready market, short term fixed deposits, trade debtors and bills of exchange receivable. However, financial performance in this study would be assessed in the perspective of revenue growth and return on investment.

2.2.1 Revenue Growth

Revenue Growth is the percentage change in a company's revenue between two or more equivalent fiscal periods. The figure shows the annual rate of increase/decrease in a company's revenue or sales growth. This gives analysts, investors and participants idea of how much a company's sales are increasing or decreasing over time. All other things being equal, a company that is able to continually grow its revenue should see equivalent increases in net income. Explicitly, revenue growth measures the changes in commercial bank's current year's revenue over previous year's revenue.

Rasiah (2010) posited that banks generate revenue mostly on their assets and the assets could be termed as income and non-income generating. With regards to commercial banks income Rasiah (2010) classified it into two, namely interest and non-interest income. The interest income consist of rates charge on loans, overdraft and trade finance which the banks offers to customers. Whereas, the non-interest income is consisting of fees, commissions, brokerage charges and returns on investments in subsidiaries and securities. According to Vong et al (2009), the major source of banks revenue is interest income. It contributes about 80% of commercial banks earnings. The other source of banks' revenue includes dividends and gains from dealing in the securities market.

Growth is an important part of every organization. It is a natural phenomenon for organizations to aspire to grow. A common measure of growth is size. Certain firm characteristics are associated with high performance of firm. These include size (Love and Rachinsky, 2007), growth rate, and liquidity (Gurbuz, Aybars & Kutlu, 2010) and revenue (Forbes, 2002). The firms that have better growth rate can afford better machinery, and then gradually the assets and size of the firm will increase. Large firms attract better managers and workers who in turn contribute to the performance of the firm. Increase in revenue signals the firm's growth prospect (Chen, Cheng and Hwang, 2005; Najibullah, 2005). It is calculated as: RG = (current year's revenue – the preceding year's revenue)/ the preceding year's revenue *100.

2.2.2 Return on Investment

No one invests for fun; every rational investor invests so as to good return from such an act. Return on investment (ROI) is performance measure used to evaluate the efficiency of investment. Simply put, it is a profitability ratio that calculates the profits of an investment as a percentage of the original cost. It shows investors how efficiently each naira invested producing a profit. It is one of the most commonly used approaches for evaluating the financial consequences of business investments, decisions, or actions. Precisely, ROI shows the degree to which a commercial bank's revenues exceed its cost. ROI is an indicator of how profitable a commercial bank is in relation to its total cost of investment. It gives an idea as to how efficiently the management uses assets to generate earnings. The return-on-investment formula is calculated as below: **ROI = Profit after Tax / Total Assets *100.**

Nwude (2012) states that if the ROI so obtained is higher than the company's cost of capital prior to the investment, and no better investment opportunities exist for those funds, it may make sense to purchase the equipment. ROI is also useful to stockbrokers in determining the gain (or loss) achieved by investing in a company over a period of time. Good investment decision requires a forecast of future events that is either explicit or implicit. Since no one has a perfect picture of the future outcome, as most of the important facts are uncertain, it is important to reduce the degree of risk and uncertainty associated with such an investment to the barest minimum before commitment of fund is made.

2.3 Electronic Fraud

There is no single accepted definition of electronic fraud. Nigeria electronic fraud forum (Neff, 2011) however defines e-fraud as "a fraudulent behavior connected with computerization by which someone intends to gain dishonest advantage. The Legal Practitioner, (2013) defines it in relation to wrongful or criminal deception that results in financial or personal gains. Electronic fraud is a fraud or theft committed using online technology to illegally remove money from a bank account and/or transfer money to an account in a different bank. Electronic or internet banking fraud is a form of identity theft and is usually made possible through techniques such as phishing, lottery fraud scam etc. There is no broad range of definitions for Electronic fraud; but the key reference in the various definitions is the fact that electronic platform and losses are involved. The losses in some cases go beyond material losses such as reputational damage and competitive advantage making it difficult for organizations to adequately determine the true impact of e-fraud in financial terms. Electronic fraud or e-fraud in its short form as it is commonly called is financial loss or fraud perpetrated through an electronic platform or product. The ease and convenience that electronic products and channels offer, is an attraction to new users and a source of loyalty to many users who have embraced the new way of payment.

With the advancement in technology, cost reduction drives, increased need to improve customer satisfaction and the need to keep pace with global banking trends, the need to electronically settle transactions with the use of electronic gadgets such as Automated Teller Machines (ATMs), Point of Sales (POS) terminals and Mobile phones become popular in the Nigerian banking industry. Banking transactions are now carried out on such platforms as online, ATM, POS, mobile phones, among others. These new platforms for transacting banking businesses are called the Alternative Banking Channels (ABCs). The ABCs are innovative service delivery modes that offer diversified financial services like cash withdrawal, funds transfer, cash deposits, payment of utility and credit card bills, cheque book requests, and other financial enquiries. Majority of transactions on these ABCs are done with the presence of card while others require card information for transactions. The advent of these ABCs has been heralded as the latest development in the evolution of money, hence they are sometimes called e-money, since they perform most (if not all) of the functions of the conventional money (Agboola, 2006). All banking services, other than loans, can be self-accessed on these platforms leading to customers preferring their usage (Khan, 2010). The use of ABCs has allowed smooth operation in the financial system. It is now possible to pay for electricity bills, phone bills, phone top-ups, insurance premiums, travelling expenses, and television cable subscriptions using the ABCs anywhere anytime.

However, fraudsters are taking advantage of the increased usage of the ABCs to defraud unsuspecting customers. The number of reported frauds on the ABCs has been on the increase over the years. Table 1 shows that number of reported frauds on ATM and POS increased from 1539 in 2012 to 11,180 in 2016. This represents 626% growth in just five years. Similarly, the number of reported frauds on online and web platforms increased from 314 in 2012 to 3,374 in 2016 representing 974% growth in number of fraud incidents in just five years. Akinyele, Muturi and Ngumi (2015) reported that actual loss to fraud through POS increased from N5.8million in 2013 to N157.6million in 2014 while mobile banking fraud loss increased from N6.8million in 2013 to N13.3million although there are reductions in the actual loss to fraud through ATM and online banking from N1.242billion to N0.5billion and N3.196billion to N0.875billion respectively in the same period. As per Nigeria Electronic Fraud Forum 2016 annual report, actual fraud loss on ATM, internet banking, POS and web stood at N464.5million, N320.7m, N243.3m and N83.8million respectively. The current rise in fraud incidents on these ABCs can make the public to further lose confidence in this technology that is meant to provide convenience and comfort in making banking transactions. As Oseni (2006) noted, customers are losing their trust and confidence in the banking system due to incessant frauds. The use of ABCs has become a major source of concern for users, ABCs providers, and banks with the proliferation of card frauds. Dipo Fatokun, director of banking and payment system, at the Central Bank of Nigeria, says fraud carried out through automated teller machines (ATM) and mobile banking is on the increase (Cable news June 29, 2018).

Speaking on Thursday at the unveiling of the 2017 Nigerian Electronic Fraud Forum annual report in Lagos, he said the value of electronic banking fraud cases between 2015 and 2017 at N5.571 billion. "It is sad to note that there has been a little increase in electronic fraud, especially in recent times. It has, therefore, become necessary to review and strengthen the existing rules and enact new regulations to steer the problem," the CBN official said. Data made available by the NeFF showed that the value of fraud carried out over the counter was N732.85 million in 2015 and has dropped to N259.022 by the end of 2017. However, fraud carried out through ATM channels rose from N355.89 million in 2015 to N497.643 million in 2017. Also, mobile payment fraud rose to N347.645 million in 2017 from N248.144 million in 2015. The 2017 NeFF Annual Report unveiled in Lagos weekend by the Central Bank of Nigeria (CBN), has shown that while the value of fraud perpetrated across counter has been on the decline over the last three years, those on Automated Teller Machine (ATM) and mobile has been on the rise. Otherwise, from N732.85m in 2015, the value of fraud committed across the counter dropped to N511.003m and N259.022m in 2016 and 2017.

In his remarks during the public presentation in Lagos, Director of Banking and Payment System at the apex bank, Dipo Fatokun, who chaired the presentation forum, explained that fraud via ATM channels has been on the rise from N355.89m in 2015, it rose to N464.514m in 2016 and increased further to N497.643m in 2017. Also, mobile payment fraud rose to N347.645m in 2017, having dropped slightly from N248.144m in 2015 to N235.17m in 2016. According to the Nigeria Inter-Bank Settlement System (NIBSS) 2014 report on fraud, the Nigerian financial system lost over N6.2billion to fraud in 2014 when compared with previous year loss figure of N485million in 2013. Although the volume of fraud cases reported in 2014 increased by 78% relative to cases reported in 2013; the value of attempted fraud cases reported in 2014 decreased by 60%. The actual loss associated with fraud cases reported in 2014 increased by over 1000% relative to 2013 loss.

Similarly, actual fraud loss as a percentage of attempted fraud increased to 80% in 2014 from 3% in 2013. Most of the fraud loss was attributable to e-fraud. The sheer size of the 2014 fraud loss and the trend it shows ought to give every well-meaning participant in the Nigerian financial system a serious cause for concern. The outlook of e-fraud in the Nigerian financial system is expected to continue in the direction that the NIBSS 2017 fraud report presents. This is so because, e-fraud is closely indexed to electronic payment which is fast growing at an unimaginable leap and bound, fuelled by various innovations in payment technology, Government and CBN initiatives such as Nigeria's policy on cashless economy and the implementation of its Financial System Strategy (FSS 2020) on one hand, and an emerging technology savvy generation of young people on the other.

2.4 Forms of Electronic Fraud

Globally, the preponderance of electronic channels in most payment system has made them ripe targets for fraudsters. This section of this study described the most common forms of electronic fraud methods.

2.4.1 Phishing

Phishing is a form of social engineering that attempts to steal sensitive information such as usernames, passwords, and card numbers usually for malicious reasons, by disguising as a trustworthy entity in an electronic communication. A fake website is created to look similar to that of a legitimate organization, typically a financial institution such as a bank or insurance company. An email or SMS is sent requesting that the recipient accesses the fake website and enter their personal details, including security access codes. The page looks genuine but users entering information are inadvertently sending their information to the fraudster. A person's personal details are obtained by fraudsters posing as bankers, who float a site similar to that of the person's bank. They are asked to provide all personal information about themselves and their account to the bank on the pretext of database up gradation. The number and password are then used to carry out transactions on their behalf without their knowledge. Phishing involves using a form of spam to fraudulently gain access to people's online banking details. As well as targeting online banking customers, phishing emails may target online auction sites or other online payment facilities. Typically, a phishing email will ask an online banking customer to follow a link in order to update personal bank account details. If the link is followed, the victim downloads a program which captures his or her banking login details and sends them to a third party. Website cloning is the duplication of a website for criminal use. Often times, websites cloning will take the form of known chat room or trade sites so that people will either unknowingly give information to the criminal or make a "fake" purchase, willingly giving money for a product that does not actually exist.

2.4.2 Identity Theft/Social Engineering

Identity theft is a form of fraud where a person using another person's personal information to engage in fraudulent activities. It can take many forms, from fraudulent credit card use, to your entire identity being used to open accounts, obtain loans, and conduct other illegal activities. Be suspicious if anyone asks you for your

personal information. Scammers use convincing stories to explain why you need to give them money or personal details. Spam is an electronic 'junk mail' or unwanted messages sent to your email account or mobile phone. These messages vary, but are essentially commercial and often annoying in their sheer volume. They may try to persuade you to buy a product or service, or visit a website where you can make purchases; or they may attempt to trick you into divulging your bank account or credit card details.

2.4.3. Skimming

Card skimming involves the illegal use of a skimming device to copy, capture and collect data from magnetic stripe and PIN on credit and debit cards. The captured card and PIN details are encoded onto a counterfeit card and used by an identity thief to make fraudulent account withdrawals and transactions in the name of the actual account holder. Skimming can occur at any bank ATM or via a compromised POS machine. Usually, fraudsters would attach false casing and PIN pad overlay devices on genuine existing ATMs, or they can attach a disguised skimming device onto a card reader entry used in tandem with a concealed camera to capture and record PIN Entry. 4.4. Viruses and Trojans Viruses and Trojans are harmful programmes that are loaded onto computers without the owners' knowledge. The goal of these programmes may be to obtain or damage information, hinder the performance of your computer, or flood you with advertising. Viruses spread by infecting computers and then replicating. Trojans appear as genuine applications and then embed themselves into a computer to monitor activity and collect information.

2.4.4 Spyware and Adware

When clicking on pop-up advertisements – ones that “pop up” in a separate browser window – it's possible you are also downloading “spyware” or “adware”. These programmes often come bundled with free programmes, applications or services you may download from the Internet. Spyware or Adware software covertly gathers your user information and monitors your Internet activity, usually for advertising purposes. Spyware such as Trojan Horse is generally considered to be software that is secretly installed on a computer and takes things from it without the permission or knowledge of the user. Spyware may take personal information, business information, bandwidth; or processing capacity and secretly gives it to someone else. "Trojan Horse" scheme unfolds when malicious software (malware) embeds to a consumer's computer without the consumer being aware of it. Trojans often come in links or as attachments from unknown email senders. After installation the software detects when a person accesses online banking sites and records the username and password to transmit to the offender.

2.4.5 Hacking:

Hacking includes gaining illegal entry into a PC system. Nowadays, the hacking of IP addresses is very universal as it permits the hackers to imagine a fake online character and carry out illegal dealings exclusive of using his factual individuality. A identity theft: A large number of identity theft crimes occur over the internet. Criminals can get a hold of your personal information through your computer and then set up fake bank accounts or take put loans in your name.

2.5 Electronic Fraud Channels

There is a growing concern over the rising trend of electronic fraud across key sectors of the Nigerian economy. The menace which follows wide acceptance of new methods of electronic banking and payment systems has been discovered to cost the country a whopping N197.9 billion annually through electronic banking channels. Nigeria Inter Bank Settlement System (NIBSS, 2015) listed the major electronic fraud channels which include automated teller machine (ATM), point of sales (POS) terminal, mobile phone banking, internet banking, e-commerce and electronic fund transfer (EFT) etc. For the purpose of this study, we focused on the first three which are most used frequently to perpetrate fraud in the banking industry.

2.5.1 Automated Teller Machine fraud

Automated Teller Machine (ATM), also known as a automated banking machine (ABM) or Cash Machine, is a computerized telecommunications machine that provides customers of a financial institution access to carry out financial transactions within or outside the banking premises without the need for a human bank teller (Jegede, 2014; Okechi et al., 2013). The ATM also enables customers to perform banking transactions such as withdrawal of cash, checking of account balances, and printing of mini account statements (Okechi et al., 2013). On most ATMs, a customer is identified and granted access to carry out financial transactions after inserting a plastic ATM card with magnetic strip or a plastic smart card with a chip (Jegede, 2014). The user is authenticated into the machine after entering a Personal Identification Number (PIN) (Jegede, 2014).

With the ATM, customers can access their bank accounts in order to make cash withdrawals from their funded accounts, credit card cash advances, transfer of funds to third party accounts, check account balances, and purchase of prepaid mobile phone credit (Jegede, 2014). The ATM provides a 24 hours service to customers (Danlami et al., 2014). The machine is programmed in such a way that it allows customers to withdraw cash or transfer funds up to a certain limit anytime of the day without being attended to by the bank staff (Danlami et al., 2014). In Nigeria, the ATM technology supports faster service delivery and helps in decongesting long queues inside the banking halls (Danlami et al., 2014). With advancement in technology, more complex machines enable customers to perform advance transactions with their cards such as making of deposits, payments of bills, among others. Sometimes, not always, customers are usually made to pay certain fees for these transactions for using this facility depending on the bank's terms and conditions for acquiring the cards and utilization of the machines for transactions (Okechi et al., 2013). Some of the ATM platform providers are InterSwitch, VPay, ETranzact, and QuickCash (Chinedu et al., 2012). These platform providers are responsible for the deployment of ATM services and provision of the means to use different banks ATM cards on different banks networks in all branches nationwide (Chinedu et al., 2012). InterSwitch, today has all banks in Nigeria connected to its network (Chinedu et al., 2012). Connectivity makes it possible for customers to use their cards in all bank branches nationwide and in almost all ATMs (Chinedu et al., 2012).

The modern contemporary era has replaced these traditional monetary instruments from a paper and metal based currency to "plastic money" in the form of credit cards, debit cards, etc. This has resulted in the increasing use of Automated Teller Machine (ATM) all over the world. Automated Teller Machine is a computerized telecommunications device that provides the customers of a financial institution with access to financial transactions in a public space without the need for a human clerk or bank teller. On most modern ATMs, the customer is identified by inserting a plastic ATM card with a magnetic stripe or a plastic smartcard with a chip that contains a unique card number and some security information, such as an expiration date. Security is provided by the customer entering a personal identification number (PIN). According to Steve (2002), ATMs are placed not only near or inside the premises of banks, but also in locations such as shopping centers/malls, airports, grocery stores, petrol/gas stations, restaurants, or any place large numbers of people may gather. These represent two types of ATM installations: on and off premise. On premise ATMs are typically more advanced, multi-function machines that complement an actual bank branch's capabilities and thus more expensive. Off premise machines are deployed by financial institutions and also Independent Sales Organizations (ISOs) where there is usually just a straight need for cash.

Although ATMs were originally developed as just cash dispensers, they have evolved to include many other bank-related functions. In some countries, especially those which benefit from a fully integrated cross-bank ATM network, ATMs include many functions which are not directly related to the management of one's own bank account, such as: Paying routine bills, fees, and taxes (utilities, phone bills, social security, legal fees, taxes, etc.), Printing bank statements, Updating passbooks , Loading monetary value into stored value cards, Purchasing and so on. Christoslav et al (2003) in a research asserted that ATM services are highly profitable for banks, and banks aggressively market the use of ATM cards. ATMs that are off bank premises are usually more profitable for banks because they attract a higher volume of non-bank customers, who must pay service fees.
Unfortunately, customers using off premise ATMs are more vulnerable to robbery. ATM robberies estimates are derived from periodic surveys of banks conducted by banking associations. According to those surveys, there was an estimated one ATM crime (including robbery) per 3.5 million transactions. Brunner et al (2004) states that the ATM fraud is not the sole problem of banks alone. It is a big threat and it requires a coordinated and cooperative action on the part of the bank, customers and the law enforcement machinery. The ATM frauds not only cause financial loss to banks but they also undermine customers' confidence in the use of ATMs. Nigeria electronic fraud forum 2017 stated that fraud carried out through ATM channels rose from N355.89 million in 2015 to N497.643 million in 2017. This would deter a greater use of ATM for monetary transactions.

2.5.2 Mobile Phone Banking Fraud

Mobile banking (also known as M-banking) is an e-banking platform that allows customers to carry out banking transactions and make enquiries through the use of a digital mobile phone that is connected to a telecommunication network or wireless network (Shah et al., 2009; Elisha, 2010). The earliest mobile banking services were offered through sending and receiving Short Message Service (SMS) (Shah et al., 2009). With this platform, customers are able to send SMS to confirm account balances and other information about the bank using their mobile phones, while the bank also respond to the customers through SMS (Shah et al., 2009). Unsolicited SMS messages sent out to customers by the bank to disseminate information about the bank and its services are referred to as push messages (Shah et al., 2009; Edojariogba, 2014). Presently, customers are able to use their mobile phones to carry out transactions such as funds transfer, receive debit/credit alerts of transactions

carried out, and send messages to the banks referred to as pull messages, for obtaining information or performing a transaction on their bank accounts. Mobile banking also allows customers to have access to their accounts where ever they are within the coverage of the telecommunication network they utilize (Balogun et al., 2013; Edojariogba, 2014).

The M-banking platform also allows customers to carry out transactions such as payment for goods and services, and payment of utility bills (Edojariogba, 2014). In Nigeria, the introduction of the cashless transaction policy by the Central Bank of Nigeria (CBN) in January 2012 has increased the use of M-banking channel by customers for transactions involving large amount of money. The cashless policy stipulates a cash handling charge for daily cash transactions that exceeds N500,000:00 for individuals and N3,000,000:00 for corporate entities (Odior et al., 2012). This policy was aimed at reducing (not elimination) the amount of physical cash circulating in the Nigerian economy and encouraging people to carry out more electronic-based banking transactions (Okechi et al., 2013; Odior et al., 2012). This policy has made most customers with mobile phones adopt and utilize available mobile banking channels (Okechi et al., 2013; Odior et al., 2012). Regrettably, the menace which follows wide acceptance of new methods of mobile electronic banking and payment systems has been discovered to cost the country a whopping N197.9 billion annually through electronic banking channels.

2.5.3 Point-of-Sale (POS) Fraud

The Point-Of-Sale (POS) e-banking channel allows customers to make payment for goods and services to clients known as merchants, in the premises of the merchants (Okechi et al., 2013). A Point Of Sale terminal is a portable device that allows customers with cards (such as ATM cards) to carry out banking transactions outside the bank's environment (Okechi et al., 2013). This ebanking platform allows bank customers to carry out financial transactions with clients (merchants) who have the device deployed in their premises irrespective of the merchant's bank and the customer's bank (Okechi et al., 2013). The POS services enable customers transacting with merchants to make cashless payments for goods and services directly into the merchant's account. The customer can also carry out transactions such as account balance enquiry, and the printing of mini bank statement with the use of a credit card or a debit card (Okechi et al., 2013). This channel is mostly preferred by customers and merchants who prefer cashless transactions (Okechi et al., 2013). With the POS, the customer's account is immediately debited at the physical point while the monetary value is credited to the merchant's bank account within a short period of time (Okechi et al., 2013). This channel requires the account holder (customer) to conveniently make immediate payments for goods and services acquired from the merchant (Okechi et al., 2013). The POS terminal is a machine that has a display screen, a barcode scanner, and a card reader (InterSwitch Ltd, 2011). Alas, Akinyele, Muturi and Ngumi (2015) reported that actual loss to fraud through POS increased from N5.8million in 2013 to N157.6million in 2014 . This is a worrisome development in the banking sector

2.6 Overview of Nigeria Electronic Fraud Forum (NeFF)

The Nigerian Financial sector has shown a steady adoption of the e-payment channels. The parties, as well as all the other players in the financial sector, have been making concerted efforts in ensuring that the financial sector is moving in line with global trends in e-payment development with the view to ensuring efficiency in the system as well as customer satisfaction.

The adoption of the e-payment channels as a preferred channel of payment increases the incidence of electronic fraud. This heightened incidence of fraud therefore brought to the fore the need for the creation of a body (named "the Nigeria Electronic Fraud Forum", "NeFF" which consists of all relevant stakeholders to actively and proactively react to this challenge to safeguard integrity of the e-payment channels.

2.7 Electronic Fraud and Corporate Financial Performance of Banks in Nigeria

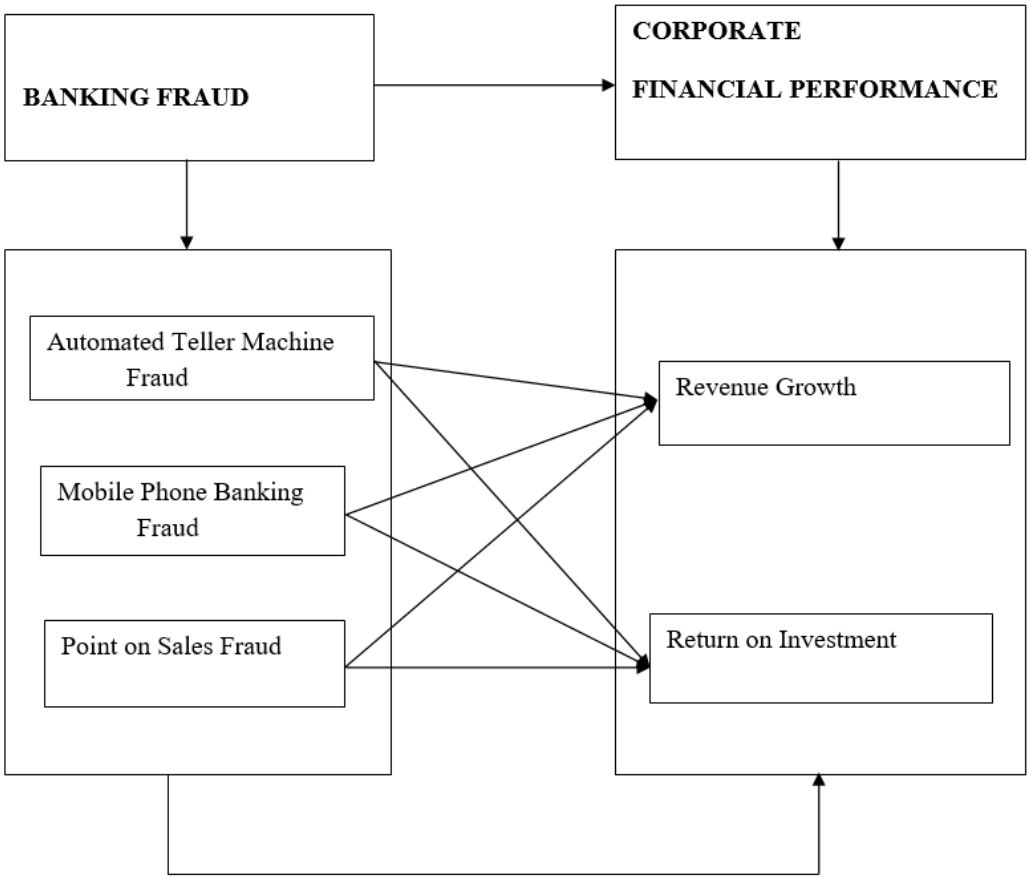
Idowu (2009) did research on the means of minimizing the incidence of fraud in Nigerian banking industry. Findings of the study revealed that, so many factors contributed to the incidence of frauds in banks amongst which are poor management of policies and procedures, inadequate working conditions, bank staff staying longer on a particular job and staff feeling frustrated as a result of poor remunerations. Adepoju and Alhassan (2010) opined that bank customers have come to depend on and trust the Automatic teller machine (ATM) to conveniently meet their banking needs, but that in recent times; there have been a proliferation of ATM frauds in the country. Managing the risks associated with ATM fraud as well as diminishing its impact is an important issue that face banks as fraud techniques have become more advanced with increased occurrences.

Akindele (2010) conducted a research on the "challenges of automated teller machine (ATM) usage and fraud occurrence in Nigeria banking industry". The study posits that lack of adequate training, communication gap, and poor leadership skills were the greatest causes of fraud in banks. He advised that adequate internal control

mechanism be put in place and that workers satisfaction and comfort be taking care of. Abdulrasheed, Babaitu and Yinusa (2012) examined the impact of fraud on bank performance in Nigeria. Result of the study shows that, there is a significant relationship between banks profit and total amount of funds involved in fraud. Finally, Kanu and Okorafor (2013) did a work on the nature, extent and economic impact of fraud on bank deposit in Nigeria using descriptive and inference statistics. The study revealed that there is a positive significant relationship between bank deposit and fraud in Nigerian banking industry.

2.8 Conceptual Framework

The salient issues underpinning the concepts of electronic fraud and financial performance are discussed broadly for better appreciation in line with the fig. 4 below.



Source: Adapted from Mwabu (2013) and Okiro & Ndungu (2013)

Fig. 3: Operational Framework of Electronic Banking Fraud and Corporate Financial Performance of Quoted Banks in Nigeria (2025).

2.9 Empirical Review

Some literatures were reviewed as relates to fraud and bank performance in Nigeria.

Kanu and Okoroafor (2013) reviewed various forms of fraudulent practices and their impact on bank deposits in Nigerian banks, for the period 1993-2010. They looked at the amount of bank funds lost to frauds and related it to total deposit liabilities of insured money banks in Nigeria. They used descriptive and inferential statistics in the study. It was revealed that there exist significant relationship between bank deposits and amount lost to fraud with fraudulent withdrawals constituting the bulk of the fraud.

Aruomoaghe and Ikyume (2013) examined fraud as a challenge to accurate financial reporting with focus on the banking sector. They adopted descriptive survey research. It was discovered that non accounting for fraud in the organisations financial statement do not reflect a true and fair view of such financial statement and may mislead the users of such financial statement.

Uchenna and Agbo (2013) evaluated the impact of fraud and fraudulent practices on the performance of banks in Nigeria, for the period 2001-2011. Twenty-four deposit money banks in Nigeria were used for the study looking at the nature, magnitude and economic consequences of fraud in Nigeria. Pearson Product Moment Correlation was used to ascertain the relationship between the variables, while Multiple Regression Analysis was adopted for analysis of impact of fraud and fraudulent practices on performance of Nigerian banks. It was discovered that the percentage of mobilized funds lost to fraud was highest between 2001 and 2005 but there was significant decrease between 2006 and 2011.

Owolabi (2010) reviewed the various forms of fraudulent practices, their impact and inducement for various forms of reform in the industry. He adopted Descriptive research design. He found out that Managers and Supervisors accounted for 485 (37%), Executive Officers/Accountants and Executive Assistants 431 (33.59%) totaling 916 out of 1283employees involved in fraudulent act between 2002 and 2006.

Odi (2013) evaluated the impact of fraud on performance of commercial banks in Nigeria, for the period 2001-2011. He took close look at relationship between ATM Fraud, Forged Cheque, Clearing Cheque Fraud, and bank performance using regression analysis for the analysis. The study found out that there is significant impact of fraud on the performance of commercial banks in Nigeria.

Inaya and Isito (2016) investigated the social impact of fraud on the Nigerian banking industry. Ex-post facto research design was adopted for the study. Data were collected from Nigerian Deposit Insurance Corporation and the commercial banks statement of accounts for the period 1990-2014. Ordinary Least Square (OLS) with its Best Linear Unbiased Estimate (BLUE) Property was used in analyzing the data. They discovered that banks in Nigeria thrive under high rate of fraud and fraud has negative social impact on the Nigerian banking industry.

Ikpefan (2006) empirically tested if there is no significant relationship between deposits on one hand and the following explanatory variable-fraud, actual/expected loss and money laundering act for the period 1989-2004. OLS regression was used. The relationships were tested using correlation coefficient, t-test, f-test and standard error tests. The result showed negative relationship between money deposits in one hand and fraud and actual/expected loss and positive relationship between amount of deposits and money laundering act.
Abdulrasheed, Babaita and Yinusa (2012) examined the problem of fraud and its implications for bank performance in Nigeria using empirical analysis. Data were collected from NDIC annual reports for the period 2004-2009. Parametric tables and Pearson Correlation were utilized for data analysis. It was discovered that banks recorded the highest cases of fraud in 2008. Hypothesis testing showed that there is a significant relationship between total amount involved in fraud cases and bank's profit.

Adediran and Olugbenga (2010) explored the impact of fraud on bank performance in Nigeria for the period 2000-2007. OLS regression was adopted for the analysis. Findings were that total reported cases of fraud, amount involved in the frauds and actual expected loss due to frauds had significant inverse relationship with commercial banks investment.

Ademoye (2012) descriptively examined the nature, causes, effects, and remedy for bank frauds in Nigeria over the period 2000-2009. Ten banks with the highest number of fraud and forgeries cases were used for the study. Also, examined were the categories of bank staff involved in the fraud and forgeries. It was discovered that from 2003-2009, a period of 7 years, a total of 656 members of bank staff were involved in 2,440 cases of frauds and forgeries with core operating staff numbering 431 involved; that is 65.7 per cent. Equally noted was the devastating impact of fraud on bank performance such that out of the 24 banks in 2009, only 13 were adjudged sound, one was marginal while 10 was rated unsound as against one unsound the previous year.

Olatunji and Adekola (2014) assessed the nature, causes, effects, detection and preventive measures for bank frauds in Nigeria. Questionnaire adopted from Alleyne and Howard was served using convenience sampling to 100 respondents. Secondary data were collected from NDIC for the period 2002-2012. Simple percentage was used for analysis. It was concluded that in view of getting and amassing quick and sudden wealth, misplaced value judgment and prevailing harsh economic environment, big time fraud were on the increase with banks losing millions of naira on daily basis and fraudsters were busy devising new means for their nefarious acts.

Yunsen, Song and Yutao (2011) explored corporate fraud and bank loans in China. It investigated the effect of corporate fraud on bank loans by investigating firms' credit and information risks, thus extending research on the economic consequences of corporate fraud. It also examined banks' lending behaviour after corporate fraud. Findings revealed that receiving punishment from regulators for corporate fraud can affect financing contract

between a firm and its bank, as both the firm's credit risk and information risk increase after punishment. Also, firms' bank loan after punishment are not only significantly lower but were also less than non-fraudulent firms. The loan interest rates after punishment were not only higher than before but also higher than non-fraudulent counterparts. Corporate fraud destabilizes the 'performance- bank loan' relationship.

Sang (2012) examined the fraud control measures put in place and evaluate the effectiveness of the internal control measures on fraud occurrence in selected commercial banks in Nakuru town in Kenya. Descriptive research design was adopted and data were collected using structured questionnaire which was administered to stratified selected sample. Analysis of data was through descriptive and inferential statistics-chi-square and linear regression. It was discovered that periodic test had 33.3 percent while daily check and weekly tests had 24.4 percent each with monthly check having 29.5 percent. Internal control was discovered to be undermined by non adherence to dual control aspects (21.8 per cent).

Afayi (2014) examined the effect of fraud on the performance of banking industry in the United States of America (USA). Banks as a whole was examined, give answers to why bank failed, examined how many banks have failed or what percentage of banks have failed in USA as a result of fraud, scrutinized the protective measures the banking industry have taken to prevent fraudulent practices and list any corrective action if need be. The study spanned from 2000-2014 in which about 523 banks have failed throughout USA. In method 1, the ratio of bank failure caused by fraud as opposed to other factors- out of 20 selected banks, 8 banks representing 40 percent failed due to fraudulent practices.

Hernando and Nieto (2005) examined the performance of multichannel banks in Spain between 1994 and 2002. The study found higher profitability for multichannel banks through increased commission income, increased brokerage fees and (eventual) reductions in staffing levels and concluded that the Internet channel was a complement to physical banking channels. In contrast to earlier studies, the multichannel banks in Spain relied more on typical banking business (lending, deposit taking and securities trading). The adoption of the Internet as a delivery channel had a positive impact on banks' profitability after one and a half years of adoption. It was explained by the lower overhead expenses and in particular, staff and IT costs after the same period.

Sathye (2005) investigated the impact of the introduction of transactional Internet banking on performance and risk profile of major credit unions in Australia. Similar to the results of Sullivan (2000), the Internet banking variable didn't show a significant association with the performance as well as with operating risk variable. Thus, Internet banking didn't prove to be a performance enhancing tool in the context of major credit unions in Australia. It neither reduced nor enhanced risk profile.

DeYoung (2001a, 2001b, 2001c and 2005) analyzed systematically the financial performance of pure-play Internet banks in U.S. The study found relatively lower profits at the Internet only institutions than the branching banks, caused in part by high labour costs, low fee-based revenues and difficulty in generating deposit funding. However, consistent with the standard Internet banking model, the results indicated that Internet-only banks tended to grow faster than traditional branching banks. Internet-only banks have access to deeper scale economies than branching banks and because of this; they are likely to become more financially competitive over time as they grow larger.

Bello and Dogarawa (2005) also examined and assessed the impact of e-banking services on customer satisfaction in the Nigerian banking industry. Their study found out that many banks' customers in Nigeria are fully aware of the positive developments in information technology and telecommunications which led to the introduction of new delivery channels for Nigerian commercial banks' products and services. The aim was to satisfy and get customer delighted. Most customers however, still patronise the bank branches and find interaction with human tellers as very important. Secondly the study found that customers enjoying electronic banking services are still not satisfied with the quality and efficiency of the services. This is expressed in the number of times customers physically visit banks and length of time spent before such services are received. Customers' perception of and reaction to these developments are issues of concern to both Government and banking industry.

DeYoung et al. (2006) observed the change in financial performance of Internet community banks in U.S. during 1999-2001. The results found that Internet adoption improved community banks' profitability, particularly through increased revenues from deposit service charges. Internet adoption was also associated with movements of deposits from checking accounts to money market deposit accounts, increased use of brokered deposits and higher average wage rates for bank employees. It found little evidence of changes in loan portfolio mix. The findings suggested that electronic adoption was associated with an economically and statistically significant improvement in bank profitability.

Mahotra and Singh (2007) examined the impact of Internet banking on banks' performance and risk in India. The study examined a comprehensive set of 10 measures of financial performance that made it possible for the authors to critically look into bank performance. By developing a deeper understanding of these phenomena, the researchers drew more insightful inferences about the impact of the internet on banking on business strategies, production processes and financial performance. The results of the study revealed that on average, internet banks are more profitable than non-Internet banks and are operating with lower cost as compared to non-internet banks, thus, representing the efficiency of the Internet banks.

Njuru (2007), did a study on the challenges in implementing electronic banking strategy by commercial banks in Kenya. The objective of the study was establishing the challenges inhibiting electronic banking implementation and how banks are responding to these challenges. The targets of the study were the commercial banks in Kenya. This study gives a brief overview of the academic literature on the challenges and the responses that organizations employ in strategy implementation and the extent of electronic business use. The study found that there exist various challenges to the implementation of electronic banking in Kenya Commercial banks. The banks have thus employed strategic responses to overcome these challenges with some of the responses being more popular than the rest depending on the Impact they have on the implementation process. Lack of required infrastructure, resources and specialized skills, commitment from the senior management team and fear of adopting the system by both the bank employees and customers were some of the major challenges that were identified while training of bank employees and customers, employing specialized technology and staff and lowering electronic banking charges were some of the popular responses that banks have been using. The entire internal and external environment however needs to be considered during the implementation of the electronic banking strategy.

Malhotra (2009) did a study on the Impact of Internet Banking on Bank Performance and Risk: The Indian Experience. Particularly, it seeks to examine the impact of Internet banking on banks' performance and risk. Using information drawn from the survey of 85 scheduled commercial bank's websites, during the period of June 2007, the results show that nearly 57 percent of the Indian commercial banks are providing transactional Internet banking services. The univariate analysis indicates that Internet banks are larger banks and have better operating efficiency ratios and profitability as compared to non-Internet banks. Internet banks rely more heavily on core deposits for funding than non-Internet banks do. However, the multiple regression results reveal that the profitability and offering of Internet banking does not have any significant association, on the other hand, Internet banking has a significant and negative association with risk profile of the banks.

2.10 Gap in Knowledge

The extant literature has revealed the following gaps below for this study to fill.

i. In the Western and Asian world, most scholars focused on general fraud and its impact on bank performance. For example, Furst, Lang and Nolle (2000), Hasan, Maccario and Zazzara (2002), Yibin (2003), Hasan, Zazzara and Ciciretti (2005), Hernado and Nieto (2006), De Young, Lang and Nolle (2007) and Ciciretti, Hansan and Zazzara, (2009) all dealt with general fraud and financial performance. Delgado, Hernando and Nieto (2004) and AL-Samadi et al. (2011) also investigated on the impact of fraud on banks performance.

ii. In Nigerian, there have been similar studies on the impact of fraud on banks by scholars like Kanu and Okoroafor (2013), Aruomoaghe and Ikyume (2013), Owolabi (2010), Uche and Agbo (2013), Ikpefan (2006) and Odi (2013). While most of them looked at it from the number and classes of staff involved, others looked at the relationship of the fraud with dividend, credit mobilization and so on.

iii. Moreso, another thread of scholars that focused on the factors influencing or exacerbating the occurrence of fraud include, (Akindele, 2011); (Chi-Chi & Ebimobowei, 2012), Famous and Okoeguale (2012), (Odi 2013), (Idowu, 2009), (Nwaze, 2006), (Ovuakporie, 1994), (Ogunleye, 2010), and Sergius & James (2018).

iv. Furthermore, on electronic banking, some set of authors have also concentrated on customer satisfaction with electronic banking (Bello, 2005; Nupur, 2010; Sharma, 2012; Ogunwolore & Oladele, 2014; and Edemivwaye, 2015), while customers' perception on electronic banking (Singhal & Padhmanabham, 2008) and customers' adoption of electronic banking (Ahmad & Al-Z'ubi, 2011). This study examined the effects of card frauds on customers' confidence in electronic banking.

v. A close look at the empirical review from other nations of the world, it is visible that none of the researchers focused on electronic fraud. In addition, all studies reviewed so far in Nigerian, none empirical was conducted on electronic fraud channels in Nigeria not even as the Central Bank of Nigeria established the Nigeria electronic fraud forum in 2012. This is a phenomenal gap in knowledge that this present study decided to fill.

vi. Therefore, this current study focused on investigating the relationship between electronic fraud and financial performance of quoted banks in Nigeria which was a clear departure from the previous studies to fill the gap.

III. METHODOLOGY

This chapter presents the methodology of the research, describing the various steps that were taken in the process of carrying out the study as sequentially discussed below.

3.1 Research Design

The study adopted ex-post facto research design. This research design was adopted because the data was generated from past or historical business activities. It equally helps to explain the relationship between independent and dependent variables as would help in actualizing the objectives of this study. The ex-post facto research design compares two or more groups of individuals with similar backgrounds who were exposed to different conditions. Corporate governance variables and financial reporting quality variable are both of similar backgrounds in that the figures are derived from the income statements

3.2 Population of the Study

The population of this study consists of fifteen (15) quoted commercial banks which shares are actively traded in Nigeria Stock Exchange (NSE) as at December 31, 2024, business year. These banks were so used because they were considered viable and seen to have the required financial wherewithal to carry on banking business in Nigeria.

3.3 Sample and Sampling Techniques

From the above quoted commercial banks, a working population was drawn based on certain criteria. The decisive factor used in selecting the working population was based on the quoting status of the commercial banks on the Nigeria stock exchange. This is because only quoted banks can be termed public liability companies (banks) (Plc), which are also expected to comply fully with the requirements of the CBN code of conduct in the banking sector. Thus, census sampling was adopted to study the entire population since it is not large.

3.4 Method of Data Collection

The data for this study was collected from secondary source. Relevant annual reports data of all the quoted commercial banks was obtained from the Nigerian Stock Exchange (NSE) and firm's website covering five years period from 2013 - 2017. Furthermore, relevant data on electronic fraud was sourced from Nigeria electronic fraud forum (NeFF) annual reports and Nigeria Deposit Insurance Corporation (NDIC) annual reports of the same periods.

3.5 Method of Data Analysis.

The nature and type of data influences the analytical techniques adopted. As this study focuses on a test of relationship of a cross-sectional data, the Pearson's product moment correlation (PPMC) and multivariate regression technique were adopted because they are the most suitable to test both relationship variables. The Unit root test, cointegration test and the granger causality test were also used to test the suitability of the data for this purpose. The data was analyzed with the aid of E-View version 9.

3.6 Operational measurement of Variables

There are two basic variables used in this study. They are financial performance (dependent) and electronic fraud (independent) variables respectively.

3.6.1 Criterion Variable Measurement. The criterion variable used in this study is the financial performance of quoted commercial banks with the following proxies:

i. Revenue Growth (RG) was measured as the changes in the commercial bank's current year's revenue over previous year's revenue and divide by the preceding year's revenue. Increase in revenue signals the firm's growth prospect. This method of measurement is in line with the works of (Chen, Cheng and Hwang, 2005; Najibullah, 2005 and Aliyu, Ofurum & Onuaha, 2018). It is calculated as: GR= (current year's revenue – the preceding year's revenue)/ the preceding year's revenue *100.

ii. Return on Investment (ROI) was measured by dividing profit after tax by total assets of the banks. **ROI = Profit after Tax / Total Assets *100**

3.6.2 Predictor Variables Measurements. Electronic fraud is the independent variable with the following proxies and measurements.

i. Automated Teller Machine Fraud (ATMF). This is measured as contained in annual reports of both Nigeria electronic fraud forum (NeFF) and Nigeria deposit insurance corporation (NDIC).

ii. Mobile Phone Banking Fraud (MPBF). This is measured as contained in annual reports of both Nigeria electronic fraud forum (NeFF) and Nigeria Deposit Insurance Corporation (NDIC).

iii. Point of Sales Fraud (POSF. This is measured as contained in annual reports of both Nigeria Electronic Fraud Forum (NeFF) and Nigeria Deposit Insurance Corporation (NDIC).

3.6.3 Decision Rule

Accept the null hypotheses if the P-Value is positive and reject it, when it is negative. The relationship is significant if the P-value is less than the standard Alpha value of 0.05 and insignificant if the P-value is greater than the standard Alpha value of 0.05 (Afayi, 2014).

3.6.4 Model Specification

In accordance with the conceptual framework and hypotheses stated earlier, the **model** for this study is specified as follows:

Functional form of the model:

RG = f (ATMF, MPBF, POSF) …….. (1)

ROI = f (ATMF, MPBF, POSF) …….. (2)

Where;

RG = Revenue Growth and ROI = Return on Investment respectively.

ATMF, MPBF, POSF = Electronic Fraud (automated teller machine fraud, mobile phone banking fraud and point on sales fraud) respectively.

Mathematical form of the model:

$RG = a_0 + A_1ATMF + A_2MPBF + A_3POSF$ ……(3)

$ROI = b_0 + \beta_1ATMF + \beta_2MPBF + \beta_3POSF$ ……(4)

The above equation 1 is trans-modified into **econometrics** form by adding constant term (β) and error term (ε) in the model below:

Econometrics form of the Model

$RG = a_0 + A_1ATMF + A_2MPBF + A_3POSF + \varepsilon$ …… (5)

$ROI = b_0 + \beta_1ATMF + \beta_2MPBF + \beta_3POSF + \mu$ …… (6)

Where:

FP = Financial Performance

EF = Electronic Fraud

RG = Revenue Growth

ROI = Return On Investment

ATMF = Automated Teller Machine Fraud

MPBF = Mobile Phone Banking Fraud

POSF = Point of Sale Fraud

$a_{0, b0}$ = Intercept

$A_1, \beta_{1...}$ = Coefficient of the predictor variables

ε,μ = error term

IV. RESULTS AND DISCUSSION

This section analyzed and interpreted the results obtained from the tests conducted on the data collected for the study. The investigators employed Pearson Product Moment Correlation Coefficient statistical tool and multivariate regression analysis with the aid of E-View version 9.

4.1 Data Presentation

The following tables depict the relevant data used for this study.

Table i : Revenue growth (RG) of Quoted Commercial Banks in Nigeria from 2013 - 2017

S/N	Banks	2013 %	2014 %	2015 %	2016 %	2017 %
1	Access Bank Plc	21.71	54.08	13.87	69.10	39.87
2	Diamond Bank Plc	11.41	67.57	28.09	13.65	3.10
3	Eco Bank Plc	85.11	49.95	46.26	18.70	9.80
4	FBN Plc	31.76	6.64	10.54	54.69	3.03
5	FCMB Plc	28.17	8.70	99.54	66.14	37.05
6	Fidelity Bank Plc	11.63	59.50	99.84	4.32	10.94

7	Guaranty Trust Bank Plc	12.52	26.61	7.69	99.90	14.72
8	Skye Bank Plc	6.87	99.87	4.24	2.22	17.26
9	Stanbic IBTC Bank Plc	17.67	99.91	18.50	75.75	23.28
10	Sterling Bank Plc	57.11	12.15	30.69	99.89	3.82
11	UBA Plc	5.69	25.39	20.77	6.51	8.39
12	Union Bank Plc	41.65	45.11	6.99	6.39	7.78
13	Unity Bank Plc	27.62	18.35	16.87	22.67	2.25
14	Wema Bank Plc	28.66	2.28	13.92	24.21	4.72
15	Zenith Bank Plc	27.30	29.42	11.55	19.51	6.62

Source: Authors computation Desk 2019 via Banks Annual Reports & Accounts

Table 2. Return on Investment (ROI) of Quoted Commercial Banks in Nigeria from 2013- 2017.

S/N	Banks	2013 %	2014 %	2015 %	2016 %	2017 %
1	Access Bank Plc	0.39	2.36	1.54	2.15	2.54
2	Diamond Bank Plc	3.07	2.09	2.24	1.26	0.25
3	Eco Bank Plc	1.78	0.59	0.65	1.46	0.45
4	FBN Plc	1.93	19.12	19.04	1.34	0.77
5	FCMB Plc	1.92	1.68	1.59	4.10	1.95
6	Fidelity Bank Plc	0.79	2.43	0.71	1.16	1.13
7	Guaranty Trust Bank Plc	3.22	5.60	4.49	4.39	4.14
8	Skye Bank Plc	0.30	1.19	1.65	0.71	3.54
9	Stanbic IBTC Bank Plc	0.75	1.45	11.05	17.36	13.00
10	Sterling Bank Plc	1.37	1.20	1.17	41.94	1.13
11	UBA Plc	0.99	2.45	2.10	1.71	2.15
12	Union Bank Plc	9.87	0.36	0.58	2.23	1.78
13	Unity Bank Plc	0.65	1.56	5.58	2.59	1.06
14	Wema Bank Plc	0.45	0.47	0.48	0.62	0.59
15	Zenith Bank Plc	1.72	3.85	2.90	2.70	2.63

Source: Authors computation Desk 2019 via Banks Annual Reports & Accounts.

Table 3. Electronic Fraud Total Loss in Nigeria in Percentage from 2013 - 2017

Electronic fraud channels	2013 %	2014 %	2015 %	2016 %	2017 %
Automated Teller Machine fraud	81.31	94.02	53.31	49.26	50.46
Mobile phone Banking fraud	10.04	0.47	37.17	24.94	35.25
Point of Sales fraud	8.65	5.51	9.52	25.8	14.29

Sources: Nigeria Electronic Fraud Forum (NeFF), Nigeria Deposit Insurance Corporation (NDIC) and Nigeria Inter Bank Settlement System (NIBSS) of various Annual Reports (2013-2017).

4.2 Data Analysis

4.2.1 Descriptive Statistics

The presentation of the descriptive statistics result with the minimum, maximum, mean and the standard deviation of variables used in our statistical models is displayed below.

Table 4: Extract of Descriptive Statistics Result

Variables	ATMF	MPBF	POSF	RG	ROI
Mean	65.67	21.57	12.75	445.21	50.84
Maximum	94.02	37.17	25.80	605.53	85.72
Minimum	49.26	0.47	5.51	192.63	29.20

Source: Authors' Computation Desk 2025 via E-View 9.

The above table shows that automated teller machine fraud has a mean performance of 65.67% with a minimum of 49.26% and a maximum of 94.02% fraud. Mobile phone banking fraud revealed mean of 21.57 % with a minimum of 0.47% and a maximum of 37.17% fraud. Similarly, point of sale fraud have an average of 12.75% with a minimum of 5.51% and a maximum of 25.80% fraud. The mean of RG stood at of 445.21% with a minimum of 192.63% and a maximum of 605.53 percent fraud. Finally, return on investment has an average of 50.84% with a minimum of 29.20 percent and a maximum of 85.72% fraud. This means that high level of fraud was noticed in the Nigeria banking industry during the period of this study.

4.2.2 Stationarity Unit Root Test

Table vi below shows the ADF stationarity unit root tests output of variables in this study via E-View version 9.

Table 5: E-View Extract of ADF Stationarity Unit Root Test Results

Variables	ADF statistic % Levels	ADF statistic Diff.	ADF statistic Critical Level.	t-Statistic	Prob.*
ATMF	10%	3rd	-3.380555	-2.469067	0.1858
MPBF	10%	3rd	-3.120686	-1.269565	0.5283
POSF	10%	3rd	-1.599804	-0.434747	0.4623
RG	1%	1st	-3.563915	-4.589799	0.0043
ROI	1%	1st	-10.66657	-9.491881	0.0159

Note; ADF = Augmented Dickey Full.

Source: Authors' Computation Desk 2025 via E-View 9.

The table above displayed the result of Stationarity using Augmented Dickey Fuller (ADF) unit root test. The results revealed that automated teller machine fraud became stationary at the first difference with (ADF t-statistic value of -2.469067 and the test critical value of -3.389555 at 10% level), mobile phone banking fraud became stationary at the first difference (ADF t-statistic value of -1.269565 with test critical value of -3.120686 at 10% level) and point of sale fraud became stationary at the third difference (ADF t-statistic value of -0.434747 with test critical valve of -1.599804 at 10% level). Similarly, revenue growth became stationary at the first difference (ADF t-statistic value of -4.589799 with test critical valve of -3.563915 at 10% level) and return on investment became stationary at the third difference with ADF t-statistic valve of -9491881 with a test critical value of -10.66657 at 1% level.

4.2.3 Granger Causality Tests

Table vii below shows the Granger Causality Tests that exists among the variables in this study and this was achieved with the aid of E-View version 9.

Table 6: Extract of Pairwise Granger Causality Test Output

Pairwise Granger Causality Tests
Date: 02/23/19 Time: 11:49
Sample: 2013 2017
Lags: 1

Null Hypothesis:	Obs	F-Statistic	Prob.
MPBF does not Granger Cause ATMF	4	0.00067	0.9835
ATMF does not Granger Cause MPBF		0.11357	0.7931
POSF does not Granger Cause ATMF	4	0.00067	0.9835
ATMF does not Granger Cause POSF		5.14918	0.2642
RG does not Granger Cause ATMF	4	1.06002	0.4907
ATMF does not Granger Cause RG		2.36063	0.3673
ROI does not Granger Cause ATMF	4	0.84909	0.5260
ATMF does not Granger Cause ROI		0.29694	0.6824
POSF does not Granger Cause MPBF	4	0.11357	0.7931
MPBF does not Granger Cause POSF		5.14918	0.2642
RG does not Granger Cause MPBF	4	8.46797	0.2107
MPBF does not Granger Cause RG		0.66391	0.5647
ROI does not Granger Cause MPBF	4	1.54776	0.4310
MPBF does not Granger Cause ROI		1.11024	0.4834
RG does not Granger Cause POSF	4	0.08042	0.8241
POSF does not Granger Cause RG		2028.97	0.0141
ROI does not Granger Cause POSF	4	0.80179	0.5351
POSF does not Granger Cause ROI		1.07127	0.4890
ROI does not Granger Cause RG	4	2.87055	0.3394
RG does not Granger Cause ROI		0.21481	0.7237

Source: Authors' Computation Desk 2025 via E-View 9.

The table above revealed the results of Pairwise Granger Causality Tests aimed at establishing if one variable Granger – cause the other and the direction of the causality. Amongst the elements of electronic fraud proxies, only POSF granger cause or wields influence on RG as the probability value (0.0141) is within 0.05 thresholds. However, all the variables are positive but not effective enough by this analysis to exert influence on economic development in the period of this study.

4.2.4 Cointegration Test

Table below shows the Johansen tests output of variables in this study via E-View 9.

Table 7: Johansen Cointegration Test Results.

Paired	Eigen Value	Trace Statistic	5% Critical Value	1% Critical Value	Hypothesized no. CE (S)
ATMF & RG	0.526343	36.698063	19.17	46.67	None*
MPBF & RG	0.739134	23.876276	17.83	33.66	At most 1
POSF & RG	0.662911	26.503914	19.17	46.35	At most 2
ATMF & ROI	0.815552	27.179631	15.41	30.04	At most 3
MPBF & ROI	0.959426	30.67162	17.83	35.28	At most 4
POSF & ROI	0.618898	38.219057	19.17	46.68	At most 5

*(**) denotes rejection of the hypothesis at the 5 % (1%) significance level
Endogenous Variables are ATMF, MPBF, POSF, RG and ROI
Source: Authors' Computation Desk 2025 via E-View 9

Under the Johansen Cointegration Test, eigenvalue statistic is used to determine whether cointegrated variables exist. Mencet (2006) states that cointegration is said to exist if the values of computed statistics are significantly different from zero and the trace statistic is lower than 5% and 1% critical values. According to the table 4 above, the results revealed no cointegration in the paired variables of (ATMF & RG, MPBF & RG, POSF & RG, ATMF & RIO, MPBF & RIO POSF & ROI). This is so because their eigenvalues (0.526343, 0.739134, 0.662911, 0.815552, 0.959426 & 0.618898) are significantly different from zero and also their trace statistics (36.980637., 23.876276, 26.503914, 27.179631, & 38.219057) are greater than 5% and 1 % critical values respectively. This could be as a result of the intensity of the electronic fraud in the banking system.

4.2.5 Correlation Analysis

The table below presents the correlation analysis results in a correlation matrix with all the variables in the study. The essence of the correlation analysis was to examine the relationships between the independent variables. Pearson correlation statistical tool was used for the analysis through E-View version 9.

Table 8: Correlation Analysis Results

Variables	ATMF	MPBF	POSF	RG	ROI
ATMF	1				
MPBF	-0.937163	1			
POSF	-0.712705	0.423185	1		
RG	0.426912	-0.592281	0.082154	1	
ROI	-0.492040	0.250140	0.774869	0.562499	1

Source: Authors' Desk, 2025 via E-View 9.

The results established that ATMF has positive and negative relationship with RG and ROI with the co-efficient of 0.426912, & -0.492040. This means that increases in automated teller machine fraud increases the level of revenue growth but it would however reduce the return on investment level of the business. Similarly, the mobile phone banking fraud indicated negative and positive association with the RG and ROI as in their coefficient -0.592281 & 0.250140 respectively. This implies that RG decreases while ROI increases with a unit changes in the mobile phone banking fraud. Besides, point of sale fraud depicts positive relationship with RG & ROI with coefficients of 0.082154 & 0.774869 respectively. This equally means that as point of sale fraud changes, the financial performance increases in the form RG and ROI respectively.

4.2.6 Regression

The study further conducted a multivariate regression analysis to determine the actual relationship between the predictor and criterion variables with the aid of E-View 9. The findings are as presented in the table vii and appendices iii-iv.

Table 9: Extract of the Regression Model 1 Results

RG = $a_0 + A_1ATMF + A_2MPBF + A_3POSF + \varepsilon$

Variables	Coefficient	Standard error	t-statistic	P-value
ATMF	5.083396	1.665341	3.052465	0.0927
MPBF	-2.842940	5.410181	-0.525480	0.6517
POSF	13.54138	10.80388	1.253381	0.3367
	R^2 = 0.485713 Adjusted R^2 = -0.028574			

*Significant at 5% (0.05) level of significance

Source: Authors' Desk via E-View Version 9

The result of the multivariate regression of model 1 is presented in table vii and appendix iii. The result helps to explain the empirical relationship between the dependent variable (revenue growth) and the independent variables. The explanatory power of the OLS regression model, R – square of the predictor variables (ATMF, MPBF & POSF) demonstrated positive and negative relationship with financial performance proxy – revenue growth as it can only accounts for about 48.57% of the cross-sectional variations in the dependent variable of RG. This implies that the remaining 51.43% variation in RG cannot be explained because it is related to other variables which are not depicted in the model. The implication is that there may be number of variables which can have impacts on financial performance of banks that need to be studied.

The coefficients model displays both negative and positive relationship implying that electronic fraud depicted negative correlation with the financial performance of banks. Furthermore, the coefficient value of (5.083396, -2.842940 & 13.54138) for ATMF, MPBF & POSF means that a unit increase in them will lead to both increase and decrease in RG. Alas, they are found to be statistically insignificant since their P-values (0.0927, 0.6517 & 0.3367) levels are more than standard alpha (0.05) level.

Table viii: Extract of the Regression Model 2 Results

ROI = $b_0 + \beta_1 ATMF + \beta_2 MPBF + \beta_3 POSF + \mu$

Variables	Coefficient	Standard error	t-statistic	P-value
ATMF	0.249903	0.192153	1.300540	0.3231
MPBF	0.120008	0.624247	0.192244	0.8653
POSF	2.496418	1.246592	2.002595	0.1832
	R^2 = 0.607791 Adjusted R^2 = 0.215581			

*Significant at 5% (0.05) level of significance

Source: Authors' Desk via E-View Version 9

The result of the multivariate regression of model 2 is presented in table viii and appendix iv. It revealed the empirical relationship between the dependent variable (return on investment) and the independent variable. The explanatory power of the regression model, R – square of the predictor variables (ATMF, MPBF & POSF) displayed positive and strong ability to predict financial performance proxy – return on investment as it accounts for about 60.78% of the cross sectional variations in the dependent variable of ROI. This implies that the remaining 39.22% variation in ROI cannot be explained because it is related to other variables which are not depicted in the model. The implication is that there may be number of variables which can have impacts on financial performance of banks that needs to be studied.

The coefficients model displays negative relationship implying that electronic fraud demonstrated negative correlation with the financial performance of banks. In addition, the coefficient values of (0.249903, 0.120008 & 2.496418) for ATMF, MPBF & POSF respectively signifies that a unit change in them will increase ROI of the banks by 0.249903, 0.120008 & 2.496418 respectively. Nevertheless, they are statistically insignificant as the p-value 0.3231, 0.8653 & 0.1832 are greater than standard alpha (0.05) value.

4.3 Hypothesis Testing Results

4.3.1 H_{O1}: Hypothesis One

There is no significant relationship between automated teller machine fraud and revenue growth of quoted commercial banks in Nigeria.

From table vii and as in appendix iii, ATMF with (β = 5.083396 & P = 0.0927) positively related with RG. This means that a decrease (improvement) in the automated teller machine fraud would increase RG by about 5.083396 of the banks. However, the p-value of 0.0927 is greater than 0.05%. Thus, the null hypothesis was accepted and the study concluded that ATMF does not significantly relate RG of quoted commercial banks in Nigeria in the period of this study.

4.3.2 H_{O2}: Hypothesis Two

There is no significant relationship between mobile phone banking fraud and revenue growth of quoted commercial banks in Nigeria.

From table vii and as in appendix iii, MPBF with (β = -2.842940, & P = 0.6517) negatively related with RG. This means that an increase in the mobile phone banking fraud would decrease RG by about -2.842940 of the banks. Nonetheless, the p-value of 0.6517 is greater than 0.05%. Thus, the null hypothesis was accepted and the study concluded that MPBF does not significantly relate RG of quoted commercial banks in Nigeria in the period of this study.

4.3.3 H_{O3}: Hypothesis Three

There is no significant relationship between point of sale fraud and revenue growth of quoted commercial banks in Nigeria.

In the same vein, table vii and as in appendix iii, POSF with (β = 13.54138 & P = 0.3376) positively related with RG. This means that a change in the point of sales fraud would increase RG by about 13.54138 of the banks. Nevertheless, the p-value of 0.3376 is greater than 0.05%. Thus, the null hypothesis was accepted and the study concluded that POSF does not significantly relate RG of quoted commercial banks in Nigeria in the period of this study.

4.3.4 H_{O4}: Hypothesis Four

There is no significant relationship between automated teller machine fraud and return on investment of quoted commercial banks in Nigeria.

The results in table viii and as in appendix iv, shown that, ATMF with (β = 0.249903 & P = 0.3231) positively related with ROI. This means that a unit decrease in the automated teller machine fraud would result in 0.249903 increase in ROI of the quoted commercial banks. Besides, it is statistically insignificant as the P-value 0.3231 is greater than 0.05% alpha value. Thus, the null hypothesis was accepted and the study concluded that ATMF does not significantly relate to ROI of quoted commercial banks in Nigeria in the period of this study.

4.3.5 H_{O5}: Hypothesis Five

There is no significant relationship between mobile phone banking fraud and return on investment of quoted commercial banks in Nigeria.

The results in table viii and as in appendix iv, indicated that, MPBF with (β = 0.120008 & P = 0.8653) positively related with ROI. This means that a unit decrease in the mobile phone banking fraud would results in 0.120008 increase in ROI of the quoted commercial banks. Nonetheless, it is statistically insignificant as the P-value 0.8653 is greater than 0.05% alpha value. Thus, the null hypothesis was accepted and the study concluded that MPBF does not significantly relate to
ROI of quoted commercial banks in Nigeria in the period of this study.

4.3.6 H_{O2}: Hypothesis Six

There is no significant relationship between point-of-sale fraud and return on investment of quoted commercial banks in Nigeria.

The results in table viii and as in appendix iv, depicted that, POSF with (β = 2.496418 & P = 0.1832) positively associated with ROI. This means that a unit decrease in the point-of-sale fraud would results in 2.496418 decrease in ROI of the quoted commercial banks. Still, it is statistically insignificant as the P-value 0.1832 is greater than 0.05% alpha value. Thus, the null hypothesis was accepted and the study concluded that POSF does not significantly relate to ROI of quoted commercial banks in Nigeria in the period of this study.

4.4 Discussion of Findings

The study investigated the relationship between electronic fraud and financial performance of quoted commercial banks in Nigeria. Built on the hypotheses tested, the findings depicted both positive and negative correlations between study variables in the period of this study.

It was observed that ATMF positively related with RG (β = 5.083396) of the bank in Nigeria during the period of this study. This means that a decrease in the automated teller machine fraud would increase RG by about 5.083396 of the banks. However, the significant value (P = 0.0927) is greater than standard Alpha value (0.05). The study therefore accepts the null hypotheses and concluded there is positive but no significant relationship between automated teller machine fraud and revenue growth of quoted commercial banks in Nigeria in the period of this study. This finding is in agreement with the findings of (Afayi, 2014) who found no significant relationship between fraud and financial performance in his study on the effect of fraud on the performance of banking industry in United States of America..

The study also found that MPBF with ((β = -2.842940) had a negative relationship with RG. It implies that 1% increase in MPBF ultimately reducing profitability by -2.842940. It was also not significantly related since (P = 0.6517) is greater than the standard Alpha (0.05). The study thus accepts the null hypotheses and concluded that there is no significant relationship between MPBF and ROA of quoted commercial banks in Nigeria in the period of this study. This is in line with the findings of Sang (2012) that conducted a study on fraud control measure and effectiveness of internal control of selected commercial banks in Kenya. The results revealed a negative and not significant relationship between the variables.

The result of this study equally shows that POSF with (β = 13.54138) had a positive relationship with RG. It implies that a unit decrease in the POSF positively increases financial performance by 13.54138. Yet, it was not statistically significant as P-Value (0.3367) was greater than the standard alpha (0.05). Thus, the study accepted the null hypotheses and concluded that there is no significant relationship between point-of-sale fraud and revenue growth of the quoted commercial banks in Nigeria in the period of the study. This is not consistent

with findings of Yunsen, Song and Yutao (2011) who had explored on corporate fraud and bank loans in China. Their results revealed positive and significant relationship between the variables

Similarly, the results of this study equally shown that ATMF with (β = 0.249903) had a positive relationship with ROI. It implies that a unit decrease in the ATMF eventually increases financial performance by 0.249903. Still, it was not statistically significant as P-Value (0.3231) was more than the standard Alpha (0.05). Thus, the study accepted the null hypotheses and concluded that there is no significant relationship between automated teller machine fraud and return on investment of the quoted commercial banks in Nigeria in the period of the study. This finding disagrees with the findings of Abdulrasheed, Babaita and Yinusa (2012) in a study to establish the relationship between fraud and bank performance in Nigeria using empirical analysis. They found significant relationship between the variables.

In addition, MPBF with (β = 0.120008) had a positive relationship with return on investment which implies that a unit change in the MPBF would certainly increases financial performance by 0.120008. Besides, it was not significantly related with ROI since (P = 0.8653) was more than the standard Alpha (0.05). The study thus accepted the null hypotheses and concluded that there is no significant relationship between MPBF and ROI of quoted commercial banks in Nigeria in the period of this study. This agrees with the findings by Kanu and Okoroafor (2013) in a study to review the relationship between various fraudulent practices and their impact on bank deposits in Nigeria. Their results had shown a positive but no significant relationship in the study.

Finally, the result also demonstrated that POSF with (β = 2.496318) positively related with return on investment implying that a change in POSF surely increases financial performance positively by 2.496318. Albeit, it was also not significant as the P-value (0.1832) was greater than standard Alpha value (0.05). This result does not tally with the findings by Odi (2013) who evaluated the impact of fraud on the performance of commercial banks in Nigeria. He found that electronic fraud shows a weak significant relationship financial performance of Nigerian banks.

V. Summary, Conclusion And Recommendations

This chapter presents the summary of the results of the study and the conclusions drawn from analysis of the data in chapter four. It comprises of summary of the findings, conclusions, recommendations and contributions to knowledge.

5.1 Summary

The study examined the relationship between electronic fraud and financial performance of quoted commercial banks in Nigeria. The study analyzed electronic fraud in the dimension of automated teller machine fraud, mobile phone banking fraud and point of sale fraud while financial performance was analyzed in the perspectives of revenue growth and return on investment.

An ex-post facto research design was adopted for the study. The sample size of this study was the entire 15 quoted commercial banks on the Nigeria Stock Exchange from 2013- 2017. Pearson Product Moment Correlation Coefficient and multivariate regression were statistical tools employed, and the secondary Cross-Sectional data was analyzed with the aid of E-View Version 9. The result showed that the independent variables (ATMF, MPBF and POSF) had a positive but insignificant relationship with the dependent variables (RG and ROI).

5.2 Conclusion

In line with the results from the tested formulated hypotheses, we conclude thus that:

i. There is a positive relationship between Automated teller machine fraud and revenue growth but not significant with quoted commercial banks in Nigeria in the period of this study.

ii. There is a negative relationship between Mobile phone banking fraud and Revenue Growth but is not significant to quoted commercial banks in Nigeria in the period of this study. Increase in MPBF by 1% reduces profitability by -2.842940.

iii. There is a positive and insignificant relationship between Point of sales fraud revenue growth of quoted commercial banks in Nigeria in the period of this study.

iv. Automated teller machine fraud has a positive and insignificant relationship with return on investment of quoted commercial banks in Nigeria in the period of this study.

v. Mobile phone banking fraud also has a positive but insignificant relationship with return on investment of quoted commercial banks in Nigeria in the period of this study.

vi. Point of sale fraud has a positive but insignificantly related to return on investment of quoted commercial banks in Nigeria in the period of this study.

5.3 Recommendations

Based on the findings from this study, the following recommendations are therefore put forward:

i. Banks should introduce more stringent measures in their staff recruitment exercise to reduce the engagement of unscrupulous staff to curtail electronic fraud cases due to increase in Automated Teller Machine (ATM) transactions, internet banking, fraudulent transfer/withdrawals through insider facilitation and suppression of customer deposit and fraud that tend to reduce bank profits.

ii. Banks should introduce more internal control measures to contain risks associated with increasing volume of deposits with a bid to track down fraud beneficiaries hidden in banks, deployment of advanced technology and collaboration with internet services providers to track web and online fraudsters via mobile phone banking as well as extension of Know Your Customer (KYC) requirement to all merchants who accept card or online payments.

iii. Regulatory authorities like Federal Ministry of Finance, CBN, NDIC, and NEFF should ensure compliance to relevant statutes. There should be strong and improved collaboration among banks and regulatory interventions on the part of the CBN to bring down the rate of fraud occurrences as well as deployment of improved transaction authentication technology on alternative banking channels. Currently banks have fraud desk to track suspicious transactions and the NEFF in collaboration with CBN that monitors electronic frauds. This will help reduce abuse and fraud.

iv. Nigerian legal system should make provision for speedy dispensation of justice in respect to fraudulent activities. A separate court to handle fraud and corruption cases should be set up. With quick dispensation of justice, others will be deterred from committing fraud. This will help in checkmating the increasing rate of fraud in Nigerian banking industry.

5.4 Contribution to Knowledge

The current study has contributed to the evolving academic literature on electronic fraud and financial performance of quoted commercial banks in Nigeria with specific focus on the electronic banking channels as most of the existing studies were based on general fraud in the banking sector.

Significantly, the study used secondary data. The relevant data on the electronic fraud was obtained from the annual reports of the Nigeria Electronic Fraud Forum which was recently established by the Central Bank of Nigeria in 2012.

5.5 Suggestions for Further Studies

i. Since electronic fraud in this study is limited to the banking industry, a similar study should be conducted in other sectors of the Nigerian economy.

ii. Also, a comparative study on the electronic fraud in the banking industry in Nigeria and other countries of the world should be conducted to establish a universal trend of electronic fraud.

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