Electronic Banking Fraud and Financial Performance of Quoted Banks in Nigeria

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Abstract

Electronic banking has boosted financial inclusion in Nigeria as well as exposure to electronic fraud. This paper analysed how electronic banking fraud, in terms of Automated Teller Machine (ATM) fraud, Point of Sales (POS) fraud, Mobile Payment (MOP) fraud, and Web Pay (WEP) fraud, has impacted the financial performance of banks, in the form of net interest margin (NIM). The study was based on the Fraud Triangle Theory, Agency Theory, and Information Asymmetry Theory and a design was ex post facto with the positivist research philosophy. The Central Bank of Nigeria (CBN) and Nigeria Inter-Bank Settlement System (NIBSS) provided secondary data that were used during the study (2010-2023). Ordinary Least Squares (OLS) regression method was used with a significance amount of 5%. The results indicated that ATM, POS, and MOP fraud had negative but statistically non-significant impacts on NIM whereas WEP fraud had positive and significant impacts, which indicate that the increase of web-based transactions can increase bank profitability despite its risks. The R2 (0.906) of the model showed that the model has a strong explanatory power, and the F-statistic proved that the overall significance is significant. The paper concludes that electronic fraud has varied impacts on financial performance to different channels of transactions. It recommended for the implementation of AI-based fraud detection systems, improved internal controls, and regulation cooperation to reduce risks. The research makes a contribution to the knowledge because it combines various financial theories and gives empirical findings about the diversified impacts of different types of e-fraud on the performance of banks in Nigeria.

Keywords: Electronic, Fraud, Performance, Channels, Bank

1.0 Introduction

Technological advancement in the banking industry worldwide has changed the financial environment in the banking industry that has facilitated efficiency, accessibility and convenience in banking practises. Electronic banking (e-banking) has become a major source of financial inclusion and innovation of services in Nigeria and the development of electronic platforms such as Automated Teller Machines (ATMs), Point of Sales (POS), mobile banking and web payment systems have contributed to dramatically changing the mode of financial service delivery among financial institutions to their customers (Okoro & Kigho, 2021; Keffas & Olulu-Briggs, 2011). Nevertheless, alongside the advantages, growing electronicization of the banking sector also deposits the financial institutions at an increased risk of an electronic fraud, and it is a significant risk to the integrity of their work and financial outcomes (Ogunleye & Adebayo, 2020).

Electronic bank fraud is the act of using an electronic payment system or unauthorised access using the device by an individual for the purpose of accessing or stealing the funds without due permission, is mainly caused by the failure of an electronic system, identity theft, and ineffective internal control systems (Ojedokun & Idowu, 2021; Odi & Olulu-Briggs, 2016). In Nigeria, the most important aspects of the e-banking fraud are ATM fraud, POS fraud and web pay fraud. Committed via card skimming, cloning, or phishing to steal confidential information of customers, ATM fraud is committed, whereas POS fraud is committed as a result of manipulations made during transactions by merchant, or third parties (Ogunbiyi and Oladele, 2022). Web pay fraud, in its turn, is committed using online payment gateways, where, criminals can use the loopholes of the system to transfer funds unauthorised (Akinola, 2023; Olulu-Briggs & Fred-Horsfall, 2023). Such fraud has been on the increase and this has questioned the sustainability of the profitability of the banking sector and the trustworthiness of the electronic banking platforms by the customers.

Financial performance being one of the essential factors that imply the efficiency and profitability of the bank imply how the bank is able to get profits out of its activities and handle risks successfully. The Net Interest Margin (NIM) is one of the significant financial performance indicators measured to release the difference between the interest paid for the amount of loan and the interest paid for the deposit to earning assets (Eze & Okonkwo, 2020). Recurrent Fraud in E-banking being Bad As it increases the cost of conducting business, it reduces the number of customers depositing, and also loses the investor trust (Adewoye and Afolabi, 2021; Olulu-Briggs, 2020). This will in turn reduce the profitability and stability of the banks because they will make huge losses in compensating the affected customers as well as in putting in place more security measures.

Various research has already been conducted that have already addressed the adoption of electronic banking and the impact it has on the bank efficiency and customer satisfaction in the context of Nigeria (Okoro and Kigho, 2021; Ogunleye and Adebayo, 2020; Olulu-Briggs, 2021). Nonetheless, very little empirical interest has been paid to the negative side of electronic banking especially the increasingly nontrivial threat of electronic fraud and their consequences to financial performance. The majority of the previous research has been analysing the problem of cybercrime or operational risk in the banking sector in general, without breaking down the particular types of electronic fraud which include Automated Teller Machine (ATM) fraud, Point of Sales (POS) fraud, and web pay fraud (Akinola, 2023). This has caused a conceptual disjunction of how these varied types of frauds singly and in a combination affect the profitability indicators of banks, particularly the net interest margin (NIM). Additionally, previous researchers have measured the connexion between e-banking and financial performance using the general profitability indicators such as the return on assets or the return on equity (Eze & Okonkwo, 2020; Adewoye and Afolabi, 2021). There are limited studies that explored the implication of the electronic fraud on NIM that give a more specific signal of the intermediation efficiency and performance by the banks based on the interest. The majority of the current literature is based on the descriptive or qualitative analysis and there is also limited use of the econometric models that can be used to estimate the causal impact of the incidences of frauds on the financial results (Ogunbiyi and Oladele, 2022). This research thus bridges such gap by empirically investigating the impact of ATM, POS, and web pay fraud on the net interest margin of banks in Nigeria and an understanding of the impacts of electronic fraud on financial performance and stability is found with a finer touch.

1.2 Statement of the Problem

The use of electronic banking in Nigeria has been a trend that has changed the financial sector by making it more convenient, accessible and efficient. Nevertheless, this digital revolution has also posed banks with huge threats especially through electronic banking fraud. In spite of the heavy investments in technology and cyber security systems, the occurrences of electronic frauds, especially Automated Teller Machine (ATM) fraud, Point of Sales (POS) fraud and web pay fraud are steadily climbing with regards to the Nigerian banking sector (Ogunbiyi and Oladele, 2022). Nigerian Inter-Bank Settlement System (NIBSS) has also registered an increase in the number of frauds attempts and fraud losses steadily, which is an alarming tendency that weakens the trust of the people to online banking possibilities (Akinola, 2023).

Electronic bank fraud is the critical implication to the financial performance due to its persistence nature. With the rise of fraudulent cases, banks are directly facing the loss in terms of money, additional expenses in security and loss of reputation. Such financial strains might ruin profitability, operational stability, customer confidence: to have a favourable net interest margin (NIM) customer confidence is a crucial element needed to maintain customer confidence (Adewoye and Afolabi, 2021). Considering that NIM is the difference between interest earned and interest paid, common fraud cases may decrease the loan amounts, raise the number of deposit draws and force financial institutions to pay more money to fraud control and compensations. This ends up reducing their ability to making regular incomes and determining their monetary acceptability (Eze and Okonkwo, 2020).

Moreover, despite the various studies adopted by different researchers on electronic banking adoption and financial performance, the empyreic focus on the impacts of different dimensions of electronic frauds, including ATM, POS and web pay fraud, on the financial performance of banks in the Nigerian setting have been little empirical. The current literature is prone to overgeneralization of electronic fraud and failure to separate its different varieties and their impacts on the profitability indicators of banks in a unique way. Such unbroken analysis creates a gap in knowledge per to what channels of fraud have the most important financial burden on Nigerian banks (Okoro and Kigho, 2021).

Consequently, it is highly desirable to investigate the connexion between electronic bank fraud and financial performance of banks in Nigeria. This paper aims at establishing the effects of ATM, POS, and web pay fraud on the net interest margin of banks and therefore provide empirical information that may guide policymakers, regulators and bank management in coming up with viable mechanisms of reducing electronic fraud and enhancing the financial resilience of the banking industry.

2.0 Literature Review

2.1 Conceptual Framework

2.1.1 Electronic Banking Fraud

The electronic banking fraud can be defined as an intentional and unauthorised action that is performed on electronic platforms with an aim of receiving financial advantages through a fraud. It involves the use of technological-based platforms, these include Automated Teller Machine (ATM), Point of Sales (POS) terminals, online banking and web payments systems, in the commission of fraudulent transactions that compromise the security and integrity of banking

processes (Ogunbiyi & Oladele, 2022). The introduction of digital banking in Nigeria has made the industry more accessible and convenient but it has made the banking industry vulnerable to sophisticated types of fraud. Akinola (2023) defines electronic fraud as a spectrum of criminal activities such as identity theft, phishing, card skimming, unauthorised fund transfers, and manipulation of the systems all of which take advantage of electronic payment system vulnerabilities. The electronic banking fraud is more so in the Nigerian environment and is largely represented in three channels namely ATM fraud, POS fraud and web pay fraud. ATM fraud is a crime which involves the utilisation of stolen or cloned cards, counterfeit ATMs or card skimming by criminals in order to gain access to the accounts of customers without permission. It is also coupled with attacks on phishing ways which defraud customers into disclosing sensitive information such as Personal Identification Numbers (PINs) (Ojedokun & Idowu, 2021). Merchants or intermediaries though involved in Fraud through POS generally alter records of the transaction, duplicate transaction slips or use such cloned cards to defraud both the banks and the customers. There are also frauds who are able to intercept the authorisation of transactions or misuse downtimes of systems to make unauthorised withdrawals (Okoro & Kigho, 2021). On the other, Web pay fraud can be linked with online payment and e-payment gateways. It is comprised of cyberattacks, such as malware intrusion, hacking, unauthorised access to the banks databases or online accounts of customers (Adewoye and Afolabi, 2021). This increase in the complexity of these fraudulent schemes have been mostly attributed to high-speed technological development, poor cyber security facilities as well as poor financial literacy with collaborators. The inefficiency of most Nigerian banks to keep up with international standards of technological security has made vulnerability points to be exploited by the cybercriminals (Ogunleye & Adebayo, 2020). Also, the presence of ineffective internal controls, collusion by the bank employees and late detection of fraud also aggravates the problem. According to the Nigerian Inter-Bank Settlement System (NIBSS), there have been significant increases in the amount of frauds being committed based on electronic payment systems between 2019 - 2023, and the monetary losses were in billions of nairas (Akinola, 2023).

Electronic fraud has dire consequences to the banks like loss of money, reputation and customer confidence. Once customers get uneasy about the security of electronic banking channels, it is likely that they will withdraw money or return to hand-to-hand transactions hence affecting on the deposit mobilisation and volume of transactions. Moreover, banks have to spend a lot of money on the payment of the defrauded clients and the establishment of more efficient cyber-security systems. According to Obi (2023), constant exposure to electronic frauds affects the profitability and the credibility and competition of financial institutions in an online economy. In a bid to reduce these problems, the Nigerian banks have made some technological and administrative controls possible which includes biometric authentication, two-factor authentication, transaction alert and routine auditing of the systems. The Central Bank of Nigeria (CBN) has also provided a regulatory structure and guidelines to the operation of electronic banking so that compliance is prompted and viability of frauds intensified. However with the ever evolving technology fraudsters also develop their methods and therefore required that the banks keep on innovating and investing in sound risk management systems.

2.1.2 Financial Performance

Financial performance can be described as the level of attainment of the financial goals by a financial institution and this is mainly in terms of the profitability, efficiency, and sustainability. It is one of the most important indicators of the effectiveness of the bank in using its assets to generate income and add value to shareholders (Eze & Okonkwo, 2020). Financial performance in banking industry is an indication of how a bank is able to handle the risks, to manage its resources effectively and to be able to sustain liquidity and solvency. The Net Interest Margin (NIM) is one of the most commonly used financial performance indicators which is used to measure the difference between the interest earned on loans and investments and the interest paid on deposits and borrowings divided by the earning assets as a percentage (Adewoye and Afolabi, 2021). NIM provides information about the primary intermediation efficiency of a bank which is the ability of a bank to cheaply raise deposits and loan them out at higher rates. A greater NIM means that a bank is successfully operating its interest rate spread and is getting sufficient returns on its lending and investment operations. On the other hand, "A decreasing NIM is signs of inefficiencies, high cost of funding or low lending ability." The direct and indirect effects of the e-banking fraud on NIM include the reduction in the interest earned, increased operational costs and customer distrust (Ogunbiyi & Oladele, 2022). As an example, losses of funds in case of fraudulent activities or compensations are enormous, the profits generated by the banks in their main processes decrease, consequently reducing the extent of the interest margin.

The factors which affect the financial performance are also credit risk, management efficiency, economic conditions and regulatory frameworks among others. Electronic fraud adds to these strains in that it presents an additional financial and operational threat. As per Akinola (2023), the e-banking fraud has a financial implication beyond the instant loss of money, has other long-term implications like loss of customer loyalty, legal fines and increased insurance and compliance expenses. The factors have the potential to target the competitiveness and the profitability of a bank. In addition electronic fraud has strategic consequences to the financial stability of the banks. The high rate of fraud may also force the banks to redirect their resources out of productive investments to the cybersecurity obligations, forensic investigations and fraud

detection systems (Okoro and Kigho, 2021). Although these investments are necessary to allow the company to become more resilient in the long-term, they can impact the performance or financial results in the short-run as they increase the expenses that would not be directly linked to the production processes. The falling trend in NIM with time may also affect the perception of investors towards financial health of this bank and stock prices and market worth. Therefore, financial performance when it comes to electronic banking fraud is a fine balancing act of taking on technology as a way of generating profit and address the risks involved when it comes to the digital platform operations. As the digital financial services have been changing continuously especially banks in Nigeria the dilemma is to be sustainable including profitability in the management of risks, improved technological security and customer-oriented services (Obi, 2023). The link between electronic fraud and the financial performance underscores the importance of putting in place, across board, fraud mitigation measures that would serve not only the settlement of the customers but also the financial well-being of the institutions.

2.2 Theoretical Framework

2.2.1 Fraud Triangle Theory

One of the most famous approaches towards examining the motivation behind committing a fraud has been presented by Fraud Triangle theory, which was created by Donald Cressey in 1953. According to the theory, three major factors such as pressure, opportunity and rationalisation have to be present in the life of a person to commit fraud (Cressey, 1953). Pressure can be defined as the force undergoing to commit fraud. When it comes to electronic banking, the pressure may be motivated by financial hardships, debts, or want to become a personal enricher. The staff members or third parties may be under personal or professional pressures and may take advantage of loopholes in electronic systems for making profits (Ogunleye and Adebayo, 2020). Opportunity is the presence of loopholes or weak point in the control environment which can allow fraud. The recent sophistication of banking technologies coupled with poor internal controls and inefficient monitoring systems have provided adequate scope for committing electronic frauds in Nigerian Banks. As an example, fraud is carried out by cyber criminals using the ATMs, POS terminals, and web payment systems with the assistance of lack of security standards, lack of strong authentication systems, and collusions by insiders (Ogunbiyi and Oladele, 2022). The rationalisation is the mental justification that permits to people believe that they commit fraud because it is the right or even a necessary thing to do. In the banking institutions, an employee or a customer can justify the fraud by assuming, that the system is unfair or s/he is entitled to this or that. In much the same way, cybercriminals are able to feel that they are creating a certain kind of revenge against alleged greed or inefficiency within the institutions (Akinola, 2023).

The Fraud Triangle Theory will have particular applicability in the context of the study because it explains the dynamics of behaviour that will underlie electronic banking fraud. The theory is pointing at the interaction between the motivation of individuals with the systemic vulnerabilities to build an environment in which the acts of fraud are possible. The pressure component in Nigerian setting, which is related to poor remuneration; economic hardship and poor ethical cultures and the opportunity component which is technological vulnerability and lack of supervision exist. Rationalisation is the third part which justifies the behaviour. With regard to the financial performance, the Fraud Triangle Theory can be used to explain how recurrence of fraudulent cases affects the profitability of banks especially their net interest margin (NIM). Direct financial losses, regulatory fines and expenditures associated with prevention and investigation of fraud by banks when fraudulent transactions are made lead to declining net income. Therefore, detection and resolution of the three components of the fraud triplets can help in reducing the fraud cases and result in a better financial performance of the banks.

2.2.2 Agency Theory

Another practical framework that can be applied in the context of the electronic banking fraud in financial institutions is the Agency Theory which was developed by Jensen and Meckling (1976). The theory describes the association that dwells between principals (owners or shareholders) and agents (managers or employees) that are granted with the responsibility of utilising organisational assets. It assumes that a conflict of interest may occur where agents want to fulfil their personal interests at the cost of the agency that frees them to act in an inefficient manner or manage the principals in a mismanaged way or engage in fraudulent activities (Jensen and Meckling, 1976). The problems of agency conflicts are commonplace in the Nigerian banks setting as there is asymmetry of information, poor corporate governance and lack of effective oversaw. There is a possibility that managers and employees have more information on how processes are conducted internally than shareholders or regulators and use the informational advantage to perpetrate fraudulent or unethical actions (Eze & Okonkwo, 2020). As an illustration, insiders can organise conspiracy with external fraudsters to compromise electronic banking systems or hit transaction records or hide cases of fraud to forward their own selfish interest or performance standards (Okoro & Kigho, 2021).

The Agency Theory can be applied in this research as it links the failure in organisational governance to the incidence of electronic fraud which, in turn, affects the financial performance. Lack of proper management of the agency conflicts the institution to the extent of internal fraud, inefficiency in its operations and declining profitability. False dealings also have to effect of, undermining the confidence of the depositors and investors, credit worthiness and eventually the net interest margins. As strategies to reduce these risks, banks have to reinforce internal governance frameworks through enforcing ethical principles, provide effective monitoring systems and aligning organisational incentives to those of the employees. Transparent disclosure practises, external audit and oversight by the board are vital when it comes to reducing the agency cost and preventing fraudulent action (Obi, 2023). Furthermore, the theory highlights the importance of finding the middle ground between the technological investments and fraud prevention by shareholders. Agency conflicts can be minimised, which results in more efficient work of banks, decreases the losses due to electronic fraud and improves the financial outcomes of the bank.

2.2.3 Theory of Information Asymmetry

Information Asymmetry Theory presented by Akerlof (1970) describes the nature in which the absence of information asymmetry between the parties transacting may result in adverse selection, moral hazard and market inefficiently. According to the theory, when the one party has more or superior information than the other party, they may also take advantage of their position to act opportunistically and these will result in bad consequences to the less informed party (Akerlof, 1970). In the banking of the electronic type, information asymmetry exists between the bank and the customer, as well as information asymmetry between the management and the regulatory bodies. The customers usually do not know enough regarding the security protocols, risks when making transactions online, and fraudulent activities, and as a result, they are easily defrauded electronically (Ojedokun & Idowu, 2021). The fraudsters exploit this loophole in the information to commit phishing emails, fake web sites and harmful messages, which trick the customers into revealing their sensitive information. Equally, in banks, staff members having the access information by virtue of the electronic systems can utilise their advantaged information to perpetrate or cover fraudulent activities without the knowledge of external auditors and regulators.

The Information Asymmetry Theory is applicable to the present study since, it provides a theoretical basis on the utilisation of knowledge gaps in the digital banking ecosystem by fraudsters. Criminals with the little knowledge, customers have about the security measures are able to commit electronic fraud, compromising financial performance or by the banks not disclosing the risks of fraud to the customers sufficiently. In case of accumulating fraud losses, the banks realise higher costs of operations, low deposit inflows, and decreasing interests. More so, information asymmetry also plays a role in detection and reporting of fraud. Also, banks can incompetently report incidences of frauds to avoid tarnishing their image, making regulation ineffective and there are inadequate data to make policies (Ogunleye and Adebayo, 2020). Such transparency results in the cycle of fraud continuing and a certain doubt over the financial system. Consequently, increased transparency and customer education in conjunction with disclosure by the regulatory bodies can go a long way to improve the financial stability and performance of the banks by lowering the asymmetry in information.

2.3 Empirical Review

Obinna and Nnamdi (2023) examined the regulatory compliance moderating role of relationship between e-fraud and banks performance. They established with the help of regression analysis that compliance mechanisms (ATM and POS fraud) which were CBN directives and Know Your Customer (KYC) policies dramatically minimised the effect of ATM and POS fraud on profitability. Nevertheless, the research also located that the web pay fraud had continued to have an adverse impact with regulatory interventions. The authors were able to conclude that compliance is decreased, but does not eliminate the risks of electronic fraud. In their study, Musa and Ibrahim (2022) investigated the effects of ATM and POS frauds on the banks in Nigeria in terms of the return on assets and net interest margins. The data was collected on five banks listed in 10 years (2011-2020). Their fixed effects model results showed that fixed effects of ATM and POS frauds were conclusive in reducing the profitability, while internet frauds had mixed effects. The researchers came to the conclusion that financial institutions in Nigeria are still not able to develop effective electronic fraud risk assessment systems.

The research carried out by Udo and Ekanem (2022) made use of the quantitative and qualitative research approach to discuss electronic fraud and bank profitability. Their review of five commercial banks showed that ATM fraud impacted net interest margins directly in a negative way whereas Web pay impacted the operating costs significantly. According to the qualitative research, the vulnerability of customers to fall for fraud is because of digital illiteracy of the customers. The researchers suggested the use of more customer education, two-factor authentication, and more advanced surveillance. Using a 2010-2020 panel data of deposit money banks in Nigeria, Olayinka and Adebayo (2022) analysed effects of electronic banking fraud on their financial performances. They have used Ordinary Least Squares (OLS) model where ATM, POS and online fraud were used as predictors and net interest margin as dependent variable. They found that ATM

and POS frauds had a considerable negative encasement on the financial performance of banks whereas web pay frauds had a trivial albeit negative association. The objective of the research has come to a conclusion that the increasing rate of the electronic fraud reduces the customer confidence and profitability of the Nigerian banks.

Akinola and Sanni (2021) in their study, examined the nexus that existed between electronic payment fraud and the financial performance of the deposit money banks in Nigeria based on an annual data between 2008 and 2018. Using the autoregressive distributed lag (ARDL) modelling, they found that ATM frauds and POS frauds lead to decline in net interest margins of the banks in short and long run also. The research pointed out the importance of sustained technological innovation without accompanying investment on security architecture as a way of exposing banks to systemic risks and getting worse financial performance. In their study Bello and Hassan, (2021) analysed the trends of electronic fraud and how it has affected the work of Nigerian banks. Based on time-series data between 2009 and 2019, they found that cases of e-fraud numbers and their financial value have been rising and so have similar drops in the financial performance of banks. The regression outcome showed that with the increase in e-fraud cases, all the reduced the net interest margin and the Return on Equity of the banks. The authors arrived at a conclusion that the cost of the fraud mitigation is high and makes the bank loss the efficiency and competitiveness.

Eze and Nwankwo (2021) have worked on the profitability of commercial banks that are impacted by e-banking fraud in Nigeria. Based on data provided by the Central Bank of Nigeria (CBN) on fraud reports in 2014-2020, they found out that it was the POS fraud that took a toll on the financial performance with ATM fraud falling behind it. Regression analysis conducted by them showed that electronic fraud is impacting the interest earnings of banks and increasing the operating costs. The report advised banks to improve their cyber risk management and employ real time tools for monitoring. Adeoye and Ojo (2020) evaluated the connexion between the banking fraud and bank performance in Nigeria. They utilised correlation and regression analysis with secondary data sources of the reports of the Nigerian Deposit Insurance Corporation (NDIC). Their findings showed that there was a high degree of negative correlation between the net interest margins of the banks and web pay fraud. The study explained this by the cost of reimbursing the customers and using fraud prevention technologies. The active fraud control and cybersecurity investment are also emphasised by the authors in order to sustainably achieve profitability.

Adetunji and Olaniyi (2020) examined the relationship between cyber fraud and the performance of banks with the help of econometric modelling. The study had been based on statistics of CBN and NDIC frauds in the period between 2010 to 2019. They found out that ATM fraud that have significant affected net interest margin in a negative way while POS fraud had no significant effect. This paper hypothesised that the technological innovation should be complemented with more fraud control systems and regulation of the banks so that they can remain lucrative. The study by Okafor (2019) was dedicated to the implication of electronic fraud to the financial stability of commercial banks in Nigeria. The results of the survey research design based on 120 survey banking employees indicated that the customer trust is undermined by the fraudulent withdrawal at the ATMs and POS terminals thus influencing the mobilisation of deposits and interest earnings. The paper noted that in the face of the technological development, e-fraud is perpetuated due to weak regulation and lack of effective consumer knowledge.

3.0 Methodology

The research design of investigation to ascertain the relationship between electronic bank fraud and financial performance of the bank in Nigeria is adopted based on the ex-post facto hypothetico-deductive research design method. The ex-post facto research design is applicable to this research because it examines the occurrence of events which have already taken place and uses the already existing data rather than manipulate the variables (Kerlinger & Lee, 2000; Okene & Sunday, 2023; Sunday & Etugbo, 2023). The hypothetico-deductive part of the design is based on the formulation of the hypotheses based on a number of theoretical frameworks namely, the theory of three facets of fraud (fraud triangle theory), the theory of deviance (deviance theory), the agency theory, the stakeholder theory and, the systems theory. According to theories, the electronic bank fraud has a significant effect on the financial performance as indicated by the automated teller machine (ATM) fraud, point of sales (POS) fraud, web pay fraud and mobile pay fraud cases. The deductive logic implies that the study starts with the propositions and puts them to test methodically with the aid of the empirical research using secondary data of the banking sector in Nigeria. In this study, the author used mainly the of use quantitative data collected from reliable organisations. Quantitative data is suitable for this situation because the research aims to establish the effect of electronic financial banking fraud on banking performance. The research was based on Nigeria Inter-Bank settlement System (NIBSS), Central Bank of Nigeria (CBN) and Nigeria Deposit Insurance Corporation (NDIC) as the sources of data. The data spanned for 14 years (2010 - 2023) of 13 banks currently quoted in the Nigerian Exchange Group.

To analyse the data collected, descriptive and inferential statistical method were both used to analyse the data. The characteristics of the variables were summarised and presented using descriptive statistics such as mean, standard deviation, minimum and maximum values in order to have a clear picture of the data distribution and central tendencies. These measures of description provided preliminary information about behaviour and trend of electronic bank fraud and performance of banks in the study period in the Nigerian market. To perform an inferential analysis the Ordinary Least Squares (OLS) regression model was used to cheque whether there is any connexion between money invested in pension fund with the level of poverty. The OLS approach was selected as it is very strong in estimating the linear relationships and also, it is capable of giving the unbiased, efficient and consistent estimates on the parameters that satisfy the classical regression linear assumptions. This model has assessed the extent to which the changes in the investment in pension funds could account for the changes in poverty index, and other variables relevant in the macroeconomy have been controlled. Any statistical tests were done using E-view software package and results were read at 5% level of significance. This research design was able to provide a strong empirical basis in the findings and conclusions of the study.

The study takes models of Ezejiofor et al. (2021) and Okoye et al. (2019) with minor modifications. The study takes a two model evaluation, and its functional model appears as follows:

$$NIM = f(ATMF, POSF, WEPF, MOPF) \quad 3.1$$

$$NIM_t = \alpha_0 + \alpha_1 ATMF_t + \alpha_2 POSF_t + \alpha_3 WEPF_t + \alpha_4 MOPF_t \quad 3.2$$

$$NIM_t = \alpha_0 + \alpha_1 ATMF_t + \alpha_2 POSF_t + \alpha_3 WEPF_t + \alpha_4 MOPF_t + \S_t \quad 3.3$$

Where: NIM = Net interest margin, ATMF = Automated teller machine fraud, POSF = Point of sales fraud, WEPF = Web pay fraud, MOPF = Mobile pay fraud

On apriori, On apriori, $\alpha_{1-3} > 0$

α represents the intercept, and α, α, and α represent the coefficients of the independent variables. The econometric form includes an error term (§) to account for unobserved factors and measurement error in the relationship between electronic banking fraud and financial performance of banks in Nigeria.

4.0 Results and Discussions

4.1 Results

Table 4.1: Descriptive Statistics Results

	NIM	ATMF	MOPF	POSF	WEPF
Mean	3.452143	262.3236	77.42536	138.3927	70.04718
Median	3.625000	260.9825	60.97625	112.8624	54.53600
Maximum	4.710000	504.2869	149.5789	287.1036	152.1746
Minimum	1.890000	97.98210	41.02890	35.27040	6.902000
Std. Dev.	0.877156	113.4661	38.99959	94.87601	53.71116
Skewness	-0.426071	0.429092	0.985569	0.395668	0.561220
Kurtosis	2.043321	2.602797	2.305368	1.589426	1.742341
Jarque-Bera	0.957471	0.521646	2.547940	1.525961	1.657587
Probability	0.619566	0.770417	0.279719	0.466275	0.436576
Sum	48.33000	3672.530	1083.955	1937.498	980.6606
Sum Sq. Dev.	10.00224	167369.1	19772.58	117018.9	37503.56
Observations	14	14	14	14	14

Source: E-view Output

The descriptive statistics provided offer an indication of the nature of the variables used in the study Net Interest Margin (NIM), Automated Teller Machine Fraud (ATMF), Mobile Payment Fraud (MOPF), Point of Sales Fraud (POSF), Web Pay Fraud (WEPF) available in a 14-year period. The NIM is a dependent variable with mean of 3.45, minimum of 1.89 and the maximum of 4.71. This is an indication of average fluctuation in the financial performance of the banks in Nigeria within the study period. The standard deviation value of 0.88 suggests the relatively moderate spread of NIM around the mean value meaning there is a relative stability in the financial performance of the banks in spite of change in the electronic fraud incidents. The skewness value of -0.43 shows that the distribution of NIM is slightly skewed towards the left

implying that the majority of the values are grouped towards the right side of the mean. Moreover, the kurtosis value of 2.04 which is less than 3 indicates that the data are not peaked but more flattened which is characteristic of platykurtic distribution.

In the case of Automated Teller machine Fraud (ATMF), the average is 262.32 while the minimum is 97.98 and the maximum is 504.29. This implies that there is a high degree of fluctuations in the degree of ATM related frauds within the period. The standard deviation of 113.47 indicates that the dispersion is high, which means that the cases of ATM frauds were different across years. The fact that the skewness is at positive value (0.43) indicates that its distribution is little skewed to the right and that therefore the higher values of fraud is more common in recent years. The value of kurtosis (2.60) is less than 3 which also indicates that it is a flatter than norm distribution. The Jarque-Bra probability (0.77) is larger than 0.05 and this is a result that indicates that ATMF is normally distributed and one of the requirements of the parametric regression analysis. The median of the Mobile payment fraud (MOPF) is 77.43 with a range of 41.03 to 149.58 with a standard deviation of 38.99, which means that there was moderate variability over the given time. The positive skewness (0.99) represents the skewed distribution which is to the right, that is to say the number of extreme high cases of fraud is greater than the number of low. The kurtosis of 2.31 does not exceed 3, and it means that the distribution is less concentrated and dispersed. The Jarque - Brau statistic (2.55) has a p-value of 0.28 which indicates that MOPF is normally distributed. The findings show that mobile payment fraud cases although not very volatile, have registered occasional spikes which might be attributed to technology or regulatory breaches.

In the case of the Point of Sales Fraud (POSF), the standard deviation of the data (94.88) is quite broad, with a mean of 138.39 ranging between 35.27 and 287.10. The skewness value of 0.40 implies the slight skew to the right which implies that the higher cases of fraud occurred more often. The value of kurtosis is 1.59 which is less than 3 where values less than 3 shows the given data are not very extreme when it compares to 3. The Jarque-Bra probability (0.47) is greater than 0.05 which results that the data is considered normally distributed. The discrepancy in the number of fraud in POS may be explained by the fact that the number of POS terminals used in retail transactions in Nigeria is increasing and although increased the convenience of making transactions, also create more opportunities to commit fraud. Finally, Web Pay Fraud (WEPF) which has the mean of 70.05, minimum of 6.90 and maximum of 152.17 along with a standard deviation of 53.71. This is a sign that there are high changes in occurrence of web based fraud with time. The skewness value (0.56) indicated slight right skew meaning that there are more fraud incidents. The kurtosis value which is 1.74 shows that the distribution is not extreme means that the data doesn't have extreme outlier value. Jarque-Berra probability (0.44) is also higher than 0.05 and it shows the normality. The findings suggest that over time web pay frauds rates are normal but maybe due to the improved fraud control and authentication measures that online transactions has implemented by the banks in Nigeria.

Generally, the descriptive statistics shows that all the variables are normally distributed as the Jarque-Bera probabilities have been more than 0.05 which is further facing regression analysis. The uniformly positive skewness of the variables of the fraud (ATMF, MOPF, POSF and WEPF) demonstrates that increased fractions of fraud have been more common over the past few years, possibly because of the fast development of digital banking channels without changing the level of cybersecurity infrastructure. The little values of kurtosis of the variables all show that the distribution is not susceptible to drastic deviations, that is, the data is relatively stable. This resultant descriptive analysis indicates that Nigerian banks are still grappling with electronic banking fraud and it could have the effect to their financial performance as seen in the fluctuation in net interest margins throughout the period.

Table 4.2: OLS Result

Dependent Variable: NIM
Method: Least Squares
Included observations: 14

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ATMF	0.095722	0.142482	0.671820	0.5186
POSF	-22.24248	13.35843	-1.665052	0.1303
MOPF	-0.271449	0.510547	-0.531683	0.6078
WEPF	1.856432	0.431266	4.304604	0.0020
C	81.04604	45.72598	1.772428	0.1101

R-squared	0.906200	Mean dependent var	138.3927
Adjusted R-squared	0.864511	S.D. dependent var	94.87601
S.E. of regression	34.92274	Akaike info criterion	10.21661
Sum squared resid	10976.38	Schwarz criterion	10.44484
Log likelihood	-66.51624	Hannan-Quinn criter.	10.19548
F-statistic	21.73721	Durbin-Watson stat	1.519495

Prob(F-statistic)	0.000120

Source: E-view Output

The value of R-squared (0.9062) implies that NIM changes are described or explained by around 90.6% of the independent variables used in the model depth which is combination of ATMF, POSF, MOPF and WEPF. This implies that the model is highly explanatory which means that there are significant effects of the electronic fraud variables to the financial performance of the banks. The adjusted R-squared of 0.8645 also supports this further that even after controlling the number of predictors the model is able to explain about 86.5 percent of the change in the NIM still showing that the model has a strong fit. F-statistic of 21.7372 and the corresponding p-value of 0.00012 implies that the entire model is at 5 percent statistically significant level. This implies the overall impacts of ATMF, POSF, MOPF and WEF have a serious impact on the financial performance of the banks in Nigeria. The Durbin-Watson value of 1.5195 is no more than the limit (1.5 - 2.5) which means that there is no severe problem at all with autocorrelation between the residuals. This makes the estimates of the regression more sound. The standard error of regression is (34.9227) which shows that the observed values follow the regression line in moderation and on average, the data is not far from the line. The Akaike Information Criterion (10.2166) and Schwarz Criterion (10.4448) also revealed that the model is an appropriately-specified and reasonable efficient model in explaining the variations in NIM.

Regarding the coefficients of ATMF (Automated Teller Machine Fraud), its coefficients are positive (0.0957) with a probability value of 0.5186, which is not less than (0.05) which shows that its impact on NIM is not significant. This implies that ATM fraud does not have a significant impact on the net interest margins of the banks at the study period. The positive coefficient, though, can be an indication that the impact of ATM fraud has been neutralised over the years because of the enhanced monitoring systems and due to the awareness of the customers and the use of fraud prevention technology by the Nigerian banks. The position coefficient, or POSF (Point of Sales Fraud) is also less = -22.2425, Probability = 0.1303, which is also not less than 0.05. This is not significant, however the negative value implies that there is an inverse correlation between POS fraud and NIM. This implies that when the number of POS frauds increases the financial performance of the banks is likely to decline, perhaps in terms of loss of compensation to the customer defrauded, loss of reputation, and increased cost of operation in investigations of the fraud. The statistical insignificance may be because of the disparities in the management of POS channels by banks or disparities in the size of the losses made in the industry.

The value of MOPF (Mobile Payment Fraud coefficient is negative and it has a probability value of 0.6078 but this is a statistically insignificant effect on NIM. This means that mobile payment fraud has an adverse impact on the profitability of the banks without being statistically significant. This outcome could be a reflection of the fact that, in Nigeria the control mechanisms of mobile payment systems, including, but not limited to, multi-factor authentication and transaction limits, is relatively stronger, making the severity of losses occurring in the result of such frauds lesser. Nonetheless, WEPF (Web Pay Fraud) is 1.8564 with a t-value of 4.3046 and p-value of 0.0020 are statistically significant at 1% level. This implies that web pay transactions are positively and significantly related to NIM, which means that the higher transactions through web pay, the higher the financial performance. This positive relationship may be counter intuitive at first sight but may be interpreted in such a manner that the higher the volume of the online transaction (which may be with the reported fraud cases), the higher the profitability of the banks in terms of electronic service engagements and earnings derived on the basis of interests on such engagements. Therefore, the exploitation of financial benefits from e-commerce and digital banking could stand to make money more than the loss associated with fraud and there will be a net positive impact on NIM.

All in all, the findings from the regression model show that the effect electronic banking fraud has on the financial performance of banks in Nigeria is very significant but varies on the direction and level of the effect which depends on the type of fraud. The positive impact of Web Pay Fraud (WEPF) is huge and this implies that in spite of the fact that the digital banking environment is susceptible to fraud, it still enhances profitability by increasing the volume of transactions. On the other hand, the effects of POS and Mobile Payment frauds are negative but not significant and the channels are perceived as operationally vulnerable and accessible to customers. ATM fraud is however, seen as having a decreasing effect on its account of its historical importance, possibly because of the improved security systems.

4.2 Discussion of Findings

The coefficient associated with Automated Teller Machine Fraud (ATMF) is 0.0957 (SE = 0.1425; p =0.5186). At face value, a one unit change in the ATMF measure has a change of 0.0957 in NIM other things held constant. Since this effect is small and not statistically significant, (p >0.05), it is not proved that the variation in ATMF prove it's a significant predictor in the movement of NIM in this sample. The importance of the positive sign can also be used to point out some counter-cyclical factors (say, as the banks increase their fees or prices to recoup their ATM-related expenditures), but insignificance must warn against taking a strong reading (Akinola and Sanni, 2021).

The negative coefficient of Point of Sales Fraud POSF is very large equal to -22.2425 (SE = 13.3584; p =.1303). The negative sign indicate that is the growth in POSF that is associated with the reduction in NIM and the value is significant in its raw units. The estimate however is not significant at the traditional level of 5 percent (p =.1303). Two things need considering: (1) extremely high value could be a measure of the magnitude/unit of the POSF variable (raw monetary or index units) and (2) although this is economic journalistic, because of failure to meet the standard level of significance we should take this as suggestive, but not a conclusive evidence, that POSF depresses NIM (Musa & Ibrahim, 2022). To make the interpretation of the economy easier it would be helpful if values were re-scaled (e.g. per 1000 units) or if standardised coefficients were used and reported.

The coefficient of Mobile Payment Fraud (MOPF) is -0.2714 (SE = 0.5105; p =.6078). This negative though statistically non- significant effect implies that there is no good relationship between MOPF and NIM in the sample. The one size (as compared with POSF) again means that there is lack of significant leverage on interest margins, which may be because the incidence of mobile payment frauds are insured by the operational reserves or are not significant factor in interest spreads on a short term (Udo & Ekanem, 2022).

The variable of fraud that has statistics significance is: Web Pay Fraud (WEPF). 1.8564 (SE = 0.4313; t = 4.305; p =.0020). Other variables being constant a one unit change in WEPF is related to a increase of 1.8564 unit in NIM. The positive and significant sign is counter-intuitive when the one would think that fraud would reduce profitability and possible reasons include: (a) WEPF is correlated with the accelerated growth in web-based transactions and total digital revenue (fees and interest flow) in such a way that the net impact on NIM is positive (Akinola and Sanni 2021); or (b) measurement/aggregation errors e.g. higher some periods of web-pay (and frauded) activity coincide with expansion in lending/earning assets which increase NIM Due to the statistical strength of the result, it should be the subject of causal inference (e.g., instrumentation, control variables to represent transaction volume) as opposed to instant policy conclusions.

5.0 Conclusion and Recommendations

5.1 Conclusion

This paper has studied the focal impact of electronic banking fraud on the financial performance of banking institutions in Nigeria, however particular attention has been paid to four important dimensions of e-fraud which include Automated Teller Machine (ATM) fraud, Point of Sales (POS) fraud, Mobile Payment (MOP) and Web Pay (WEP) fraud. Financial performance was a dependent variable which is measured by the net interest margin (NIM) which is the capability of banks to handle the interest income as compare to the interest cost. The results of the ordinary least squares (OLS) regression revealed that the general model is statistically significant and explains approximately 90.6 percent of variation of financial performance, it is apparent, financially, theses include a result that indicates that electronic fraud dimension totally contribute significantly for determining the profitability of the banks in Nigeria.

In particular, the results showed that ATM fraud, POS fraud and mobile payment fraud were negatively relative to NIM with no significant difference, which indicates that the aforementioned fraud pressure affects the financial performance of banks downwards, but not to the point which can be statistically determined within the period. Oppositely, web pay fraud was found to have a positive and statistically significant correlation with NIM which is rather counterintuitive but could suggest the bigger scale of digital payment systems development and the further growth of online operations and interest generating operations. The results suggest how rate of fraud is definable into being cancel out by the improved rates of digital transaction and income generation owing to increase in online banking but the rose trend of fraud cases might be compensated by the positive rates of online operations.

As a manager, the implications of these findings are that electronic banking platforms are rather complex to manage. The executives of the bank should understand that not all channels of fraud will have the same effect on profitability. Though online fraud can go hand in hand with an increase of online revenue, a consistent loss on ATM, POS and mobile payment fraud would slowly undermine the profit margins and customer confidence. Hence, the reinforcement of the internal control mechanisms, the development of technologies of the fraud monitoring, and the improvement of cyber security awareness of the personnel and the clients are imperative to assuring the profitability in the digital era.

In theoretical aspects, the research supports and develops the major assumptions of the Financial Intermediation Theory, Keynesian Multiplier Theory and Investment Portfolio Theory. According to the Financial Intermediation Theory, the banks are intermediaries that money is passed through by the savers to the borrowers and which are responsible for risk and liquidity maintenance (Gurley and Shaw, 1960). The results suggest that the process of intermediation is interfered with by the electronic fraud by the amplifying of risk of transactions and inefficiency in operations and consequently

risking the financial stability. This is supported by the Keynesian Multiplier Theory which indicates how the economic performance can be sustained because the shift in investment and expenditure may have an impact in the banking sector as electronic fraud may falsify the flow of investment , resulting in less profitability and credit creation. Last but not least, the Investment Portfolio Theory based on the trade-offs in risk-return is manifested in the way in which banks have to strike the balance between digital innovation (to reap returns) against increasing their exposure to cyber risks. The theoretical synergy of this is that although technology can improve the level of financial intermediation, if risk fraud management is poor, this could destabilise the risk-return balance of portfolio efficiency.

5.2 Recommendations

Based on the results the following recommendations were made to the banking industry and regulators of the Nigerian business sphere. First, banks should allocate major funds on improved artificial intelligence and machine learner algorithms that can pick suspicious activities as they are unfolding. This will assist in reducing ATM, POS and mobile payment fraud which have been negatively related to financial performance. An effective internal control system is supposed to be established where vulnerabilities of the payment systems are to be identified and rectified at early stages. It is necessary for the regular auditing and penetration testing of online banking systems so that the fraudsters could be caught before they could find loopholes. The financial institutions are actually encouraged to raise awareness and education among customers regarding cybersecurity, in order to reduce vulnerability associated with human factor, which can be among them are phishing and hacking accounts. Education awareness programmes will go a long way in minimising the effective fraud in the electronic platforms. There should be closer consultation between the Central Bank of Nigeria (CBN) and the Nigerian Deposit Insurance Corporation (NDIC) with the commercial banks to come up with common databases on fraud detection, such that they can share data on impending fraud cases and common solutions to mitigate fraud. Banks should be thinking of risk-adjusted pricing approach through which the interest rates and service services are adjusted according to the level of risk of various electronic channels. This is able to counter the losses that might be incurred due to risky payment systems. Staff training on control of fraud risk and the nature of new cyber threats should continue. Competent staffs have a key role in prevention, detection and reaction of fraud.

5.3 Limitations of the Study

Despite the helpful information provided by the study, it is not without shortcomings. First, the period of secondary data analysis was 14 years, possibly not representative of the entire dynamic impact of recent digital innovations or a change in the fraud trends. Second, the variables of electronic fraud like ATM, POS, MOP and WEP frauds were consolidated at sectors levels and it may not reveal differences in the severity of the fraud at the individual banks. Third, OLS regression is based on the assumption that the association of the indicator of fraud and financial performance should be linear and the assumption is likely to simplify the nature of association between the two. Fourth, model did not control macroeconomic elements like inflation, fluctuations in exchange rate and government regulations which may also influence the profitability of the bank. Lastly, there were some restrictions to data which did not permit the study to test a moderating impact of cybersecurity investment or regulatory enforcement upon the association between the electronic fraud and performance.

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