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## **Electronic Payment Adoption and Deposit Money Banks Corporate Financial performance in Nigeria: Vector Error Correction Model**

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### **Abstract**

Banking sector is experiencing a profound transformation powered by advancements in digital technology. Despite the swift adoption of digital banking solutions, significant challenges persist that could relate to money banks corporate financial performance in Nigeria. Thus, the aim of this study is to analyses and derived. Empirically the relationship between electronic payment adoption and deposit money banks corporate financial performance in Nigeria from 2014-2023. Adopting ex-post facto research design, panel data collected from Central Bank of Nigeria statistical bulletin, Nigerian Exchange Group, National Bureau of statistic and annual reports of the selected banks were analyzed using a robust methodological descriptive statistics, unit root test, pooled, fixed, and random effects modeling, Hausman and Breusch-Pagan Lagrange Multiplier test, cointegration and error correction model with the aid of E-view version 12.0. Empirical findings indicate that automated teller machine, mobile payment channels, internet payment channels significantly enhance earnings per share. The study therefore conclude that electronic payment adoption significantly relates to deposit money banks corporate performance and recommends that it is recommended that banks should continue to expand their Automated Teller Machine (ATM) infrastructure since this investment improves market valuation, thereby strengthening investor confidence and market perception. Banks are encouraged to strategically deploy ATMs in underserved areas to widen accessibility and capture additional market share, ensuring equitable financial inclusion across urban and rural communities.

### **Keywords:**

*financial performance, earnings per share, automated teller machine, mobile payment channel, internet payment channel.*

## Introduction

Financial performance is a measure of how well an enterprise used its assets and other resources from its business in order to generate revenues (Olike et al, 2022; Shaheen et al, 2023; Oluwajuwon et al, 2024). Companies are formed with the sole purpose of making profit which usually depends on their decision-making mechanism. In addition, Magara et al (2025) submitted that financial performance is measured to give the account of stewardship by the management team to the shareholders. The key aspect of this involves measuring the profitability (Shan, 2021; Rahmawati & Hadian, 2023), Market value (Potapova et al, 2022; Oluwajuwon et al, 2024), growth prospect of a company (Olufemi, 2021; Olafin et al, 2024). Performance is said to mean the efforts extended to achieve the targets efficiently and effectively which involves the integrated use of equity and debt by manager's is one of the strategies used by firms to improve their financial performance (Mwai et al, 2014; Okorie, et al, 2024). Financial performance is the scientific evaluation of profitability and financial strength of any business concern as financial statement analysis attempt to unveil the meaning and significance of the items composed in income statements and statement of financial position which will assist management in the formation of sound operating and financial policies (Mpieri et al, 2024; Mahboub & Sadok, 2024).

Ideally, the emergence and development of information technology have revolutionized operations in business organizations and the way businesses and customers interact in both developed and developing countries (Menzli et al, 2022; Mbotto et al, 2023). This paradigm shift prompted several industries to align their service delivery with electronic payment adoption (EPA). One of these industries that have experienced significant changes and development in the use of electronic payment adoption to render services to customers is the banking industry (Gonzalez et al, 2022; Hussain, 2024). Banks use technology to provide self-service to customers through various electronic channels (Freihat, 2019; Giannetti, 2023). Apart from branch banking, banks offer electronic banking services such as automated teller machine, internet banking mobile banking services, and point of sale. Among these technology-based service options, automated teller machine, mobile payment and internet appears to be the most popular (Oghojafor et al, 2024; Nwaiwu & Joseph, 2026). Automated teller machine, mobile payment channel and internet payment channels are technological innovation developed to offer diversified financial services and to provide 24 hours a day, 7 days a week, 54 weeks a year (24/7) service to customers, without human interaction or bank teller (Cho et al, 2023; Efemena & Augustine, 2024).

Nigerian banks have been investigating huge sums of money in the development and maintenance of electronic channel platforms, especially in automated teller machine, mobile payment channel and internet payment channel (Arilesere et al, 2021; Awoniyi, 2022). To encourage customers to use the electronic channels effectively and efficiently, banks and central bank of Nigeria have been promoting strategies and practices aimed at increasing usage. Akinyele et al (2021), Adesina & Nwidobie (2022), Adeoyo (2023) noted that banks persuaded their customers to subscribe to automated teller machine, internet payment channel and mobile payment channels. Some banks have placed restrictions on over-the-counter withdrawals, such that customers are not encouraged to withdraw below a certain amount across the counter. Also, some banks debit the number of customers whose automated teller machine card has expired before requesting for a new one. On the part of central bank of Nigeria, there have been some efforts to encourage an increased use of electronic channel. In 2003, Central bank of

Nigeria stipulated guidelines on electronic banking for banks to ensure the security of electronic channels and promote customer's trust in various electronic platforms (CBN, 2003). The regulatory body also introduced cashless policy in 2012 (CBN, 2012) and guidelines on operations of electronic payment channels in 2016 to encourage bank customers' to actively utilize electronic payment channels for payment (CBN, 2016). Despite these efforts, it has been observed that bank customers are not making full use of automated teller machine, mobile payment channels and internet payment channels.

Empirical research studies have been carried out between electronic payment channels and financial performance in particular sector of the economy. Adewuji et al (2020), Ademola et al (2024), Nwaiwu (2026) investigated electronic payment channels and performance of deposit money banks in Nigeria and their empirical results were mixed and inconclusive. Adesina and Nwidobie (2022), Adeoye (2026) explored the relationship between electronic payment adoption and firms financial performance, due to methodology and sample size adopted their empirical result indicated positive, negative and mixed.

Rahmawati and Hadian (2022) examined the relationship between electronic payment system and financial performance of quoted deposit money banks in Nigeria, Kenya and Ghana, using different statistical tools and analysis, their empirical results were mixed and inconclusive. Despite the large volume of research interest, the puzzle remains. Most of empirical studies found differing views which may be due to either the methodology adopted or the time frame, thus bringing to question how it has been employed. Moreover, there are deviations with regards to the measures used. Although much investigation has been done in developed economies, much has not been done especially among deposit money banks of developing economies like in the case of Nigeria. It therefore becomes imperative to explore empirically, the relationship between electronic payment channels and deposit money banks corporate financial performance in Nigeria.

The remainder of this study after the introduction is as follows; section II is on review of related literature; section III confers the methodology/technique adopted. Section IV is empirical result and discussion. Conclusion and recommendations, limitation and suggestion for further studies is on section V of the study.

## **Literature Review and Hypotheses Development**

This section consists a holistic review of existing literature and conceptual discourse related to the research topic. It also encompasses a theoretical and empirical review of the chosen topic.

### **Theoretical framework**

This study is theoretically guided by the technological acceptance model and resource-based theory.

The Technology Acceptance Model (TAM) propounded by (Davis, 1989) is similar to the diffusion of innovation theory but it places more concern on psychological predispositions and social influences such as beliefs, attitudes and intentions. Marcus's theoretical model of adoption highlights the importance of innovative behaviour and the phenomenon of others modeling themselves on this. Communication channels are a vital component in spreading this modeling behaviour to other potential adopters. The range of influential factors in the take-up of innovations include: the associated 'costs' (personal and institutional), the availability of

necessary 'resources' (money, equipment, training, time, prior experience and relevant skills) and the 'value' of the innovation (Bates, et al, 2007). Kwon and Zmud (1987) define five contextual factors that may impact on any six identified stages of information technology implementation namely; user community characteristic, organizational characteristics, technology characteristic, task characteristic and environmental factors. Robertson and Gatignon (1986) propose that a variety of competitive effects in the technology consumers industry (competitive intensity, demand uncertainty, professionalism and cosmopolitanism) and within the technology supplier's industry (level of competitiveness, reputation, Research and Development allocation, technology standardization) impact the rate and level of diffusion of high technology innovations. Other models focused on the influence of culture in the diffusion and adoption process. Both personal and organisational processes influence a culture of innovation. These organisational processes include: management values, rewards, prohibitions, encouragement of new ideas, encouragement of risk-taking, services, support, communication channels and staff networks. An institution with these key components in place is better placed to ensure that innovations are facilitated, encouraged, accepted and diffused across its organisation. In this wise, the institutional environment shapes the development of the ICT initiative, its adoption and implementation. The success or failure of a new ICT innovation is thus influenced by culture (Denning, 2004; Bates, Manuel & Oppenheim, 2007).

### **Resource Based Theory**

The resource-based theory of the firm was propounded by Wernerfelt, (1984). The theory is based on the premise that valuable resources aid in improving a firm's effectiveness and efficiency while neutralizing the opportunities and threats of competition. Where the firm's resources and capabilities are valuable and can be considered strengths, they invariably enable a firm to enhance its competitive advantage. Molla and Licker (2005) incorporated the intention of understanding the ecommerce adoption in developing countries. By introducing two dependent variables (i. e-Readiness for auditing the perceived ecommerce awareness; and ii. Internal organizational and external contextual determinants of e-commerce) they sought to capture e-commerce changes in the developing countries. Their findings suggest that organizational factors especially the human, business and technological resources and awareness are more influential than environmental factors in the initial adoption of e-commerce but as organization adopt ecommerce practices, the advantages from resources become less important and environmental factors, together with commitment and governance model established, affect the organization's ecommerce institutionalization.

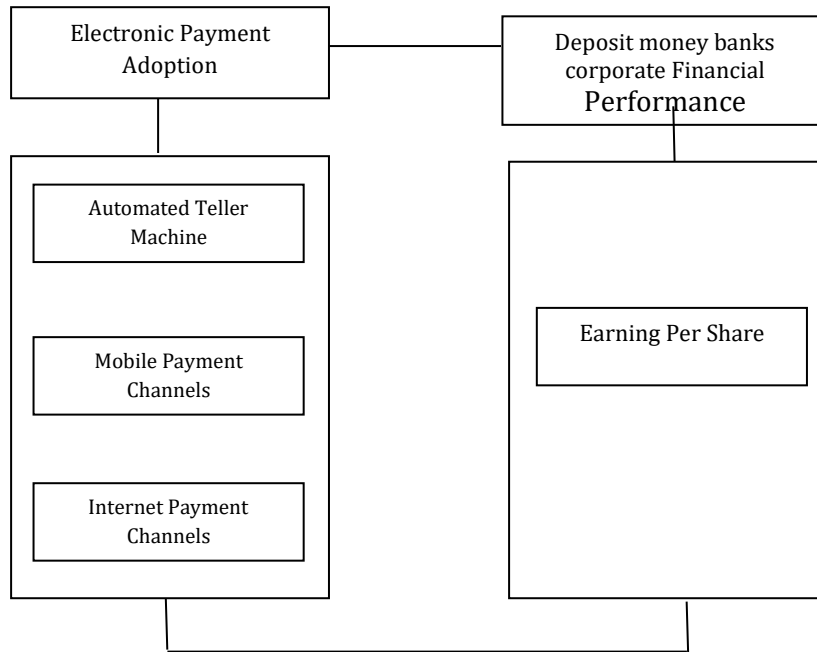
Zhu (2006) proposed the following three stages of e-business assimilation; 1st Stage – Initiation evaluating the potential benefits of e-business to improve a firm's performance in value chain activities such as cost reduction, market expansion, and supply chain coordination; 2nd Stage - Adoption: making the decision to use the internet for value chain activities(i.e. allocating resources and physically acquiring the technology); and; 3rd Stage - Routinization: the extent to which development, feedback, and adjustment activities are performed to ensure the innovation becomes ingrained within business activities.

Their findings highlighted that, as e-business evolves, the key determinant of its assimilation shifts from the 'accumulation' to the 'integration' of technologies which are very much influenced by contextual factors. Since their study involves a comparative study between

developed and developing countries, (Zhu, et al, 2006) also stress that these e-business adoption factors may vary across the different assimilation stages, in different environments.

**Conceptual Framework**

Based on the foregoing discussion, this empirical study developed a conceptual framework to guide, as illustrated in figure I.



**Figure I:** Conceptual Framework of Electronic Payment Adoption and Deposit Money Banks Corporate Financial Performance in Nigeria: Vector Error Correction Model.

**Source:** Automated Teller Machine (Money & Iyoha, 2025), Internet Payment Channels (Nwaiwu, 2026), Mobile payment Channels (Adeleke & Yusuf), Earnings Per Share (Adeniran & Aladejebi, 2023).

**Earnings Per Share**

The earnings per share ratio is a measure of the profit (income) that shareholders receive for each share they own (Esra, et al., 2022). Earnings per share is sometimes regarded as the most important variable in determining the firm’s stock price or the performance in most of the research, thus being used by individual investors in deciding their investments. Previous empirical studies have shown results are incongruent when comparing the earnings per share variable to the performance indicator. While Nafisah etal (2020), Chandra etal (2020) indicated that earnings per share have positive influence on a financial performance of a firm. Nuradawiyah and Sisilawati (2020) found that earnings per share negatively influences the performance of the firm. According to the most recent research by Manlina etal (2023) earnings per share has no impact on performance.

**Electronic Payment Channels**

Payment systems refer to the legal, regulatory, and standard-based network that connects bank accounts and provides the required functionality for monetary exchange using bank deposits. It

is a set of institutions, organizations, instruments, regulations, standards, procedures, and technical processes that enable the transfer of monetary value between parties who are fulfilling mutually agreed-upon responsibilities (Massimo & Gracia, 2008; Summers, 2012). Electronic payment systems, according to Harelimana (2018), are a type of inter-organizational information system for monetary transaction that connects multiple organizations and individual consumers. This may necessitate intricate relationships among stakeholders, technology, and the environment. Payment systems can be physical (traditional) or electronic (virtual), with information and communication systems used to supply the required services.

As a result, electronic payment systems are information communication technology-based systems designed to make monetary transactions between parties using bank-based platforms more convenient. Automated Teller Machines (ATMs), Point of Sale (POS) machines, Mobile Banking, and Internet (Online) Banking Platforms are all functioning electronic payment systems in Nigeria. Because the services can be evaluated on electronic devices owned by individual clients, the final two choices promise higher ease and wider utilization. Electronic payment methods, according to Bingilar and Bariweni (2019), have some advantages over their physical equivalents. The first is the speed with which transactions are completed, regardless of the distance between parties. Another advantage is the convenience of conducting financial transactions from the comfort of one's bed or even the bathroom.

Financial transactions conducted through electronic systems are also easier to track, making them easier to audit and monitor for fraud or managerial decision-making. Given these advantages, banking institutions stand to gain a lot by creating electronic payment systems as a viable alternative to traditional payment methods. According to Okifo and Igbunu (2015), electronic payment systems provide a substantial number of economic benefits that are available in the country through banks, in addition to their convenience and security. Electronic payment systems, by being quick and inexpensive to use, have the potential to increase financial inclusion and deepening in developing countries like Nigeria, where savings mobilization remains a challenge.

Electronic banking, on the other hand, is the word for a new type of financial system that is also known as online banking (Auta, 2010). E-banking makes use of the internet as a delivery channel for banking services such as money transfers, bill payments, checking and savings account balances, mortgage payments, and the purchase of financial instruments and certificates of deposit (Akinyele & Olorunleke 2010) Electronic banking refers to the supply of banking services and goods by electronic methods, regardless of location, time, or distance. Deposit-taking, lending, account management, financial advising, electronic bill payment, and other electronic payment products and services, such as electronic money, are examples of such products and services (Dogarawa, 2015).

### **Automated Teller Machine**

It is automated telecommunication device connected with a secure cash register and cash register system. Enabling customers to enter the bank ATM machine by using personal identification by inserting into the machine. Rose (1999). Mainly located at places that attracts many people like at the airports, shopping centers and locations outside the national banking offices, offering customers various retail banking services, reducing the burden on ATMs. First presented as an ATM, it offers numerous products and services which is not limited to making deposits, fund transfers across two or more accounts plus paying bills like electricity and water.

Abor (2004) Today, ATMs offer payment solutions that allow customers to pay with plastic, as it is a requirement for current business owners. Providing a reliable electronic payment solution based on older data can help reduce the time traders spend on other types of payments and allow them to focus on customer service and sales. The solutions for electronic payments and online transaction processing allow the acceptance of loans and debits, checks, currency acceptance and contacts with fewer payment options.

### **Internet Payment Channels**

This involves the use of virtual banking, considered also as telephone banking provides different payment options by using internet. Banks use telephone banking to perform many transactions to its customers by informing them the status of their accounts or any answering the request forwarded to the bank. Under e-banking the client conducts business operations by negotiating with the use of phone connected to the automated banking system which is done using automotive voice response Balachandler et al (2001) Telephone banking has many advantages towards the end users, on the side of customers it gives them comfort, extended access and time savings. Internet banking saves time that could be wasted by visiting the bank or going to ATMs, retail banking has the main objective of providing customers with services at their homes or their offices. Hence being money saving for the customers and provides comfort and efficiency (Leow,1999).

### **Mobile Payment Channels**

Research conducted by zik (2005), highlighted that mobile payment is the payment system that was settled using the mobile device. It is where individuals can access funds using their mobile phones for example, one can perform numerous transactions with his phone like to make payments to various clients or to get money from his phone to the bank account. In the part of payments, the possibility of using phone payment system can be viewed as on built-in (smart) card that can be useful in the storage of user's information. The fundamental importance of using other tools like Modems, point of sale terminals and mobile card readers is quite considerable (Zika,2005, costello2003) the study predicted the future development of mobile payment content will be possible in the coming days. Mobile payments can be used in micropayments such as payment of parking fees, transport tickets and charging cell phones

As of current, many banks in Rwanda provide Mobile banking services commonly referred as SMS banking. It enables bank clients to do any inquiries regarding the banking details, bank balances by the use of their cell phones mobile. The SMs banking helps in cutting costs that could be incurred by customers to perform various transactions like balance inquiry, transaction inquiry, requesting for cheque book, bank statement request and utility bill settlement and clients can access their account balance and between various mobile money accounts.

### **Empirical Review**

The relationship between electronic payment channels and deposit money banks corporate performance has been a subject of several empirical investigations since the seminal work of Berle and Means (1932). The match of the most relevant empirical studies examining this relationship with their authors, years country, study title, methodology and empirical findings are summarized in table 1.

**Table 1:** Summary of Empirical Review between Electronic Payment Paradigm and Corporate Deposit Money Banks Financial Performance

Author/Year	Country	Subject	Methodology	Empirical Findings
Nwaiwu and Joseph (2026)	Nigeria	Electronic payment system and performance of quoted deposit money banks in Nigeria	Descriptive statistics, ordinary least square analysis	Empirical findings revealed that electronic payment system and performance of quoted deposit money banks in Nigeria.
Ayoade et al (2025)	Nigeria	Digital Payment platforms and financial performance of deposit money banks in Nigeria	Auto-regressive Distributed lag	Findings revealed that ATM and WebPay had a negative and significant impact on financial performance, likely due to high operational costs and cyber security risks. POS and Mobile payment had no significant effect, indicating a limited direct contribution to the performance of deposit money banks in Nigeria.
Money and Iyoha (2025)	Nigeria	Electronic Banking channels and financial performance in the Nigerian banking industry	Unit root test, bounds co-integration test, autoregressive distributed Lags	The results reveal a mixed pattern of findings; internal and mobile banking demonstrate statistically significant positive impact on profitability while automated teller machines and point of sale channels exhibit inverse impacts, mainly due to high operational and infrastructural costs. Conversely, the influence of all four channels on financial deepening ratio is statistically insignificant, suggesting that the current deployment of electronic banking technologies does not substantially enhance long-term financial inclusion. Those findings underscore the dual nature of electronic banking, profitable when efficiently scaled, but insufficient in driving inclusive finance without complementary structural and policy reforms.
Osakwe et al (2024)	Nigeria	Effects of ATM and Mobile banking on the performance of deposit money banks in Nigeria	Ordinary least squares regression method	The results demonstrated that both ATM usage and Mobile banking significantly and positively influenced the performance of deposit money banks.
Adegoke et al (2014)	Nigeria	Effect of electronic payment systems on the performance of microfinance banks in Nigeria.	Descriptive statistics, correlation analysis and fixed effect regression model.	Results indicated that ATM (0.0003; $P < 0.05$ ) and POS channels (0.0116, $P < 0.05$ ) have positive and significant effect on the performance of microfinance banks, as measured by ROA and ROE. However, findings revealed that MBB (0.226, $P < 0.05$ ) had positive but

				significant effect on the performance of microfinance banks in Nigeria.
Hussian (2024)	Pakistani	Digital banking on Pakistani Commercial banks' financial performance	Multiple Regression analysis	The research findings indicated that an increase in online banking transaction was favorably and strongly correlated with profitability.
Iwedi et al (2023)	Nigeria	Influence of financial technology on financial inclusion in Nigeria.	Vector Auto regression estimation technique.	The findings indicated that web banking technology exerted a positive and statistically significant effect on financial inclusion. Although ATM, POS, and Mobile banking also shared positive impacts, these were not statistically significant.
Ghanador (2023)	Nigeria	Impact of electronic banking systems on the performance of deposit money banks in Nigeria.	Descriptive statistics, ordinary least square regression analysis.	The findings indicated that ATM and POS had a positive on the performance of deposit money banks in Nigeria.
Muttai et al (2023)	Kenya	Impact of financial technology on financial performance of commercial banks in Kenya	Descriptive statistics, inferential statistics, correlation and panel multiple linear regression analysis	The study revealed that technology is sufficient in predicting financial performance.
Arilesere et al (2021)	Nigeria	Digital electronic payment techniques as a financial technological innovation and its impact on banks performance in Nigeria.	Error Correction Model	The study revealed that digital payment by way of mobile banking, automated teller machine and internet banking has significant influence and is positively related to bank financial performance of deposit money banks in Nigeria.
Nwalpnu et al (2020)	Nigeria	Electronic banking and profitability of deposit money bnaks in Nigeria	Regression analysis	The findings indicated that the ATM payment method had a negative effect on return on equity of deposit money banks in Nigeria, but this effect was not statistically significant. Similarly, the POS payment method had a positive effect on the return on equity of deposit money banks in Nigeria, but this effect was not statistically significantly. Additionally, the mobile banking payment method had a positive effect on the return on equity in Nigeria, but again this effect was not statistically significant.

Agu and Nwankwo (2019)	Nigeria	Impact of the electronic banking system on the financial performance of selected Nigerian deposit money banks.	Ordinary least square regression techniques.	The analysis revealed that ATM and MMT had a positive effect on ROE, but the effect was not statistically significant on the other hand, POS had a negative effect on ROE, but it was also not statistically significant for the selected Nigerian deposit money institutions.
Ugbede et al (2019)	Nigeria	Effect of electronic payment on financial performance of deposit money banks in Nigeria	Multiple regression analysis	The findings indicated that ATM did not contribute to bank profitability and was not statistically significant in relation to bank profitability. However, POS had.
Enoruwa et al (2019)	Nigeria	Electronic banking and bank performance in Nigeria.	Regression Analysis	Findings indicated that electronic channel products such as ATM and Mobile payment were positively and strongly associated with bank performance.
Bingilar and Bariweni (2019)	Nigeria	Impact of electronic payment systems on the performance of commercial banks in Nigeria	Regression analysis	The findings of the study revealed a positive relationship between online banking transactions and ROA of commercial banks a positive contribution to bank profitability and was statistically significant. Additionally, internet banking also had a positive contribution to bank profitability and was statistically significant.
Praise and Mike (2019)	Nigeria	Impact of electronic payment systems on financial deepening indicators in Nigeria.	Descriptive statistics, unit root test, cointegration, error correction model	The findings revealed a bi-directional causality between ATM transactions and credit to the private sector (LCPSGDP), along side a unidirectional relationship between ATM transactions and broad money supply (LM2GDP)

### Methodological Framework Issues

This area of study shows the methodological framework issues adopted to estimate the relationship between electronic payment channels and deposit money banks corporate financial performance. The design applied is ex-post facto research design and panel data regarding the variables were sourced from the central bank of Nigeria statistical bulletin, National Bureau of Statistics, Nigerian Deposit Insurance Corporation, Nigeria Revenue Service and Annual Report of the quoted selected banks from Nigerian Exchange Group. The choice of secondary data and its sources were based on the fact that the data are assumed to be reliable (Ayoade et al, 2025, Nwaiwu, 2016), Suitable (Ademola, et al, 2024), and adequate for the nature (Adeoye, 2023), Scope (Adesina & Nwidohie, 2022), and objectives of the study and are therefore assumed to be Error free (Akinrinola & Folorunso, 2022).

## Model Specification

The regression model adopted for the study is derived from similar works of Adewuyi et al (2020), Akinrinola & Folorunso (2020), Al-Qaraleh (2023), Nwaiwu (2026) with slight modifications to suit the peculiarities of the study. The modifications made were in the use of variables and model framework. The functional form is expressed as thus;

$$EPS_{it} = f(ATM_{it}, MPC_{it}, IPC_{it}) \quad (i)$$

Expanding the functional form into mathematical model as follows;

$$EPS_{it} = \beta_0 + \beta_1 ATM_{it} + \beta_2 MPC_{it} + \beta_3 IPC_{it} \quad (i)$$

Re-arranging the mathematical model and introducing the error term into econometric model as thus;

$$EPS_{it} = \lambda_0 + \lambda_1 ATM_{it} + \lambda_2 MPC_{it} + \lambda_3 IPC_{it} + e_{it} \quad (iii)$$

Where:

$EPS_{it}$  = Earnings Per Share 'i' for the year 't'

$ATM_{it}$  = Automated Teller Machine 'i' for the year 't'

$MPC_{it}$  = Mobile Payment Channel 'i' for the year 't'

$IPC_{it}$  = Interest Payment Channel 'i' for the year 't'

$i$  = 'i' for the year 't'

$e_{it}$  = Error Term 'i' for the year 't'

$\beta_0, \lambda_0$  = Constant 'i' for the year 't'

$\beta_1 - \beta_3, \lambda_1 - \lambda_3$  = Regression Slope 'i' for the year 't'

### Apriori Expectation

From the foregoing, it is expected that electronic payment channel will relate significantly with deposit money banks corporate performance. In summary, the apriori expectation is stated as follows:

$$\beta_1 - \beta_3 > 0; \lambda_1 - \lambda_3 < 0$$

The secondary data collected from various sources were analyzed with descriptive statistics, ordinary least square regression analysis, stationarity test, Hausman test, Lagrange Multiplier test, Panel cointegration test, error correction model with the aid of E-view version 12.0

## Results and Discussion

In order to have a glimpse of the data used in the study, a first pass at the data in form of descriptive statistics were carried out. This gives a good idea of the patterns in the data used for the analysis. The summary statistics is presented in table 2.

**Table 2** Descriptive Statistics Results.

This section focuses on descriptive statistics, which summarize the central tendencies, dispersions, and overall distributional characteristics of the study variables. Descriptive statistics are essential in this research because they provide a preliminary understanding of how electronic payment channels and bank performance indicators vary across banks and over time. Measures such as the mean, median, standard deviation, minimum, and maximum offer insights into the general levels of adoption for ATMs, ITPC, and MPC, as well as the corresponding performance outcomes. For instance, observing the mean and standard deviation of earnings per share across the banks can indicate not only the average market valuation but also the degree of variation, reflecting differences in investment strategies and operational efficiencies. Similarly, descriptive statistics of EPS help identify profitability patterns. This statistical summary is crucial for validating data consistency, detecting potential outliers, and guiding the selection of appropriate econometric models for further analysis.

The descriptive statistics section provides a systematic summary of the key characteristics of the dataset, highlighting central tendencies, dispersion, and distributional properties of all variables included in the study. This section is crucial as it enables researchers and stakeholders to understand the underlying patterns of electronic payment channel adoption—comprising Automated Teller Machines (ATM), Internet Payment Channels (ITPC), and Mobile Payment Channels (MPC)—and bank performance indicators such as earnings per share (EPS). By examining measures like the mean, median, standard deviation, skewness, and kurtosis, the study identifies typical values, variability, and the shape of the data distributions, which informs subsequent modeling choices. Additionally, the Jarque-Bera test statistics and associated probabilities provide insights into the normality of the data, which is essential for selecting appropriate parametric estimation techniques. Descriptive statistics also allow for the detection of outliers or extreme values, helping ensure robustness and reliability in the empirical analysis.

**Table 3: Descriptive Statistics of Study Variables**

Variable	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Probability	Sum	Sum Sq. Dev.
ATM	1200.0	1227.97	1269.74	1042.63	108.18	-0.64	2.71	9.71	0.18	120000.0	1,158,602
ITPC	550.0	569.49	611.92	506.46	53.71	-0.11	3.54	3.59	0.59	55000.0	285,565
MPC	350.0	338.22	393.46	271.84	38.07	0.31	2.98	7.73	0.13	35000.0	143,446
EPS	2.5	2.44	2.79	1.85	0.54	-0.92	2.37	4.52	0.93	250.0	29.26

**Automated Teller Machine (ATM):** The mean number of ATMs across the sampled banks is 1,200, with a median of 1,227.97, suggesting a slightly higher central tendency in the upper range of ATM deployment. The maximum of 1,269.74 and minimum of 1,042.63 indicate that all banks maintain a substantial ATM network, although there are variations in scale likely reflecting differences in bank size, market coverage, and strategic priorities. The standard deviation of 108.18 reflects moderate dispersion, suggesting that while some banks aggressively expand ATMs, others take a more conservative approach. The negative skewness (-0.64) indicates a slight concentration of banks with higher ATM counts, implying that most

banks are clustered toward the upper end of ATM deployment. This trend demonstrates that ATM infrastructure is a critical channel for the sample firms to enhance accessibility, customer convenience, and market presence, reinforcing their role in sustaining financial performance.

**Internet Payment Channels (ITPC):** ITPC exhibits a mean of 550 and a median of 569.49, indicating that most banks maintain a moderately high level of internet banking adoption. The maximum of 611.92 and minimum of 506.46 suggest that all banks are actively engaging in digital banking, although adoption intensity varies. The relatively low standard deviation of 53.71 reflects consistent levels of internet payment infrastructure across the sample. A near-zero skewness (-0.11) indicates a symmetrical distribution of internet banking adoption among the banks. This trend reflects a sector-wide recognition of the importance of ITPC in improving operational efficiency, reducing transaction costs, and attracting tech-savvy customers, which collectively enhance performance metrics like Tobin's Q, ROE, and Market Share.

**Mobile Payment Channels (MPC):** MPC has a mean of 350 and a median of 338.22, with a maximum of 393.46 and a minimum of 271.84, showing that while mobile payment adoption is growing, there is notable variation among banks. The standard deviation of 38.07 indicates moderate variability, reflecting that some banks are early adopters while others are gradually integrating mobile technologies. Positive skewness (0.31) suggests that a few banks have significantly higher adoption relative to the rest. This pattern underscores the strategic importance of mobile payment systems in reaching a broader customer base, increasing transaction volume, and complementing ATMs and internet banking for overall service delivery.

**Earnings Per Share (EPS):** EPS averages 2.5 with a median of 2.44, and varies between 1.85 and 2.79. The standard deviation of 0.54 reflects modest variability, indicating consistent earnings performance across the sample. Negative skewness (-0.92) suggests a clustering of banks toward higher EPS values, implying that many banks achieve better-than-average shareholder returns. This trend confirms that digital payment adoption—through ATMs, ITPC, and MPC—contributes to improved earnings, reinforcing investor confidence and the financial attractiveness of the sampled banks.

**Table 4:** Pooled Effect Model Result – Dependent Variable: Earnings Per Share (EPS)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.215	0.512	6.277	0.0000
ATM	0.431	0.153	2.816	0.0065
MPC	0.376	0.142	2.648	0.0098
ITPC	0.399	0.147	2.714	0.0084

In the pooled model for EPS, all independent variables are positively associated with earnings per share, and the relationships are statistically significant. The ATM channel, in particular, shows the strongest contribution to EPS. The high R-squared value of 0.687 reflects that over 68% of the variation in EPS is explained by the model, indicating strong predictive performance. This suggests that digital payment adoption strongly influences shareholder value in the Nigerian banking context.

### Error Correction Model (ECM)/Long-Run Test

The Error Correction Model (ECM) or Long-Run Test is an essential tool in time series and panel data econometrics, particularly when working with non-stationary variables that have been shown to be cointegrated. In the context of this study, which explores the relationship between electronic payment channels (ATM, Mobile Payment, and Internet Banking) and the performance of listed deposit money banks in Nigeria, the ECM helps assess how the system adjusts to short-term deviations from the long-term equilibrium relationship established by the cointegration test. The primary goal of the ECM is to capture the speed at which a dependent variable returns to its long-term equilibrium after a shock or disturbance. In other words, it measures the dynamics of adjustment over time in response to the discrepancies between short-term and long-term behavior. The key component of the ECM is the error correction term, typically denoted as  $ECMt-1$ , which represents the lagged disequilibrium from the long-run relationship. If this term is statistically significant, it suggests that any short-term imbalances will eventually correct themselves, bringing the system back to the long-run equilibrium. For this study, the Error Correction Test is applied to each of the four performance models: Earnings Per Share, with the cointegrated series from the previous step forming the basis for this analysis.

The following tables present the ECM/Long-Run test, based on the optimal model specifications from the earlier stages of the study.

**Table 5:** Error Correction Test/Long-Run Test – Model: Earnings Per Share (EPS)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ATM (Level)	0.128	0.052	2.46	0.0153
MPC (Level)	0.211	0.069	3.06	0.0023
ITPC (Level)	0.107	0.045	2.38	0.0174
Error Correction Term (ECMt-1)	-0.387	0.087	-4.45	0.0000

For the Earnings Per Share model, the ECM results show that ATM, mobile payments, and internet payment channels all significantly influence EPS. The error correction term ( $ECMt-1$ ) is negative and statistically significant, with a coefficient of -0.387. This means that 38.7% of any deviation from the long-term equilibrium in EPS will be corrected in each period. The presence of a significant error correction term suggests that the adjustments in earnings per share, in response to shocks in payment systems or firm-specific characteristics, occur at a rapid pace, ensuring long-term stability. The results of the Error Correction/Long-Run Test across the four models indicate that all variables in the models, except firm age (FA), significantly influence the long-term performance of listed deposit money banks in Nigeria. The error correction terms for each model are statistically significant and negative, which suggests that any deviations from the long-term equilibrium are corrected in a reasonable time frame. This provides strong evidence that the adoption of electronic payment channels has a persistent

impact on bank performance, and the system adjusts to long-term equilibrium after any shocks or disturbances.

### **Hypotheses Testing**

In this section, we tested each hypothesis based on the results from the Error Correction Model (ECM)/Long-Run test. We evaluated each hypothesis in terms of its null and alternative versions, followed by a detailed analysis of the test results.

#### **H<sub>01</sub>: There is no significant relationship between Automated Teller Machine and Earnings Per Share.**

For **Earnings Per Share**, the coefficient of ATM is 0.128 with a t-statistic of 2.46 and a p-value of 0.0153. As the p-value is less than the 0.05 threshold, we reject the null hypothesis, indicating that there is a significant positive relationship between ATM and Earnings Per Share. Thus, we accept the alternative hypothesis that ATM significantly relates to Earnings Per Share. The study found that ATM usage also significantly relates to Earnings Per Share (EPS), with a positive coefficient. This indicates that banks with a higher number of ATMs experience greater profitability, which, in turn, improves their earnings per share. For investors, this result is highly relevant as it demonstrates that banks investing in ATM infrastructure tend to generate higher earnings, benefiting shareholders. EPS is a key performance indicator for investors, and the finding underscores the financial benefits of ATM networks in enhancing shareholder value. Signaling Theory suggests that companies signal their financial health through key performance indicators such as EPS. By investing in ATMs, banks signal their commitment to customer convenience and technological advancement, which can translate into increased investor confidence and higher earnings (Spence, 1973).

#### **H<sub>02</sub>: There is no significant relationship between Internet Payment Channel and Earnings Per Share.**

In the Earnings Per Share model, the coefficient for ITPC is 0.107, with a t-statistic of 2.38 and a p-value of 0.0174. Since the p-value is less than 0.05, we reject the null hypothesis. This indicates that there is a significant positive relationship between Internet Payment Channel and Earnings Per Share. Thus, we accept the alternative hypothesis that Internet Payment Channel significantly relates to Earnings Per Share.

#### **H<sub>03</sub>: There is no significant relationship between Mobile Payment Channel and Earnings Per Share.**

In the Earnings Per Share model, the coefficient for Mobile Payment Channel is 0.107, with a t-statistic of 2.38 and a p-value of 0.0174. As the p-value is less than 0.05, we reject the null hypothesis, indicating a significant positive relationship between Mobile Payment Channel and Earnings Per Share. Thus, we accept the alternative hypothesis that Mobile Payment Channel significantly relates to Earnings Per Share. The study found a significant positive relationship between mobile payment channels and Earnings Per Share (EPS), meaning that banks that deploy mobile payment systems tend to report higher earnings per share. For investors in the Nigerian banking sector, this result signifies that banks investing in mobile payment technologies are likely to see an increase in their profitability, which directly impacts shareholder returns, as reflected in higher EPS. As mobile payment adoption grows, investors will find banks with these systems more attractive due to the potential for long-term growth in

earnings. Banks that capitalize on this digital shift by adopting mobile payment systems position themselves as market leaders, increasing their appeal to investors and enhancing shareholder value. The significant relationship between mobile payments and EPS supports the Signaling Theory (Spence, 1973), which argues that firms signal their financial health through key metrics such as EPS. By investing in mobile payment technology, banks signal their commitment to innovation and their ability to generate sustainable earnings, which strengthens investor confidence and increases market valuation. This finding is consistent with the Resource-Based View (RBV), which suggests that organizations with greater resources, such as larger size, can more effectively leverage technological innovations to improve their performance. Additionally, the result reinforces the Technology-Organization-Environment (TOE) Framework (Tornatzky & Fleischer, 1990), which posits that organizational factors such as size influence the adoption and success of technological innovations. Larger organizations are better positioned to overcome barriers to technological adoption, resulting in more effective implementation and superior outcomes.

### **Conclusion and Recommendations**

This study explored the relationship between electronic payment channel and deposit money banks in Nigeria. theoretically, the study found that electronic payment channel has completely changed the way banking is conducted in Nigeria, it has brought a lot of numerous convenience, flexible, efficient and interesting services to customers' at relatively lower cost. Customers can transfer funds, pay utility bills, view order cheque, stop cheque, airtime top up etc. from the comfort of their rooms and offices. However, based on empirical results, automated teller machine, mobile payment channels and internet payment channels positively significantly relate to earnings per share. Therefore, the study strongly concludes that electronic payment channel exerts significant relationship with deposit money banks corporate financial performance in Nigeria.

Based on the empirical findings and conclusion, this study strongly recommends;

- (i) The need for the deposit money banks in Nigeria to increase massive mass media enlightenment campaigns on all payment system innovations/initiatives, intendam with the position that increase consumer's patronage of payments system technology with increasing the financial performance of deposit money banks in Nigeria.
- (ii) There is also the need deposit money banks in collaboration with central bank of Nigeria to established reliable payments system dispute arbitration framework, as that will increase public confidence on the use of the payments system channels, hence increase in financial performance of banks.

### **Limitation and Suggestion for Further Studies**

This empirical investigation has come up with interesting concluding remarks. However, like any other research it is not without limitation. This study acknowledges that the analysis only analyse the relationship between electronic payment channel and deposit money banks corporate financial performance using automated teller machine, mobile payment channel, internet payment channel and earnings per share, spanning from 2012-2023. Inference from the empirical results obtained in this study can be more

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