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E-Banking Charges and Financial Performance of Deposit Money Banks in Nigeria: Perception of Customers

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Abstract

Purpose: This study investigates the effect of electronic bank charges on the financial performance of deposit money banks in Nigeria.

Design/Methodology/Approach: This study examined variables such as e-banking charges, bank lending ratios, customer deposits, return on assets, and return on equity. Using an ex-post factor research design, the study population consisted all the fourteen (14) registered deposit money banks in Nigeria licensed by the Central Bank of Nigeria as at 31st December 2023 for secondary data collection purpose. The primary data population comprised all the residents in Ijebu North local government in Ogun State, out of which 200 residents were selected by simple random sampling technique as the sample size and a sample of 10 DMBs through purposive sampling method. Data were collected via questionnaires and annual reports of all the sampled DMBs over a 10-year period between 2014 and 2023, yielding a panel data of 100 observations.

Findings: The results show that EBC has a negative effect on ROE ($t = -0.3586$, $p = 0.0508$) and ROA ($t = -14.7071$, $p = 0.0000$). In addition, CD has a statistically significant positive effect on ROE ($t = 1.55E-07$; $p = 0.0430$), while BLR has an insignificant effect on ROE. Furthermore, there have been reports of an insignificant effect of CD and BLR on ROA.

Practical Implications: The study concluded that although customers generally perceive electronic banking services as convenient and beneficial, concerns about the transparency, fairness, and affordability of banking charges remain significant. Banks should be cautious not to prioritise revenue generation from service charges at the expense of customer experience.

Originality/Value: Despite growing reliance on digital revenue, limited scholarly attention has been paid to the comprehensive evaluation of how e-banking charges influence banks' financial performance in emerging markets.

Paper type: Research paper

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INTRODUCTION

The evolution of electronic banking has become a defining feature of modern financial systems, transforming how banks deliver services and customers interact with financial institutions. Electronic banking (e-banking) encompasses a wide range of digital financial services, including online banking, mobile banking, automated teller machines (ATMs), electronic funds transfer (EFT), and Unstructured Supplementary Service Data (USSD) platforms. These technologies offer customers enhanced convenience and accessibility while also enabling banks to reduce operational costs and expand service delivery (Dhal et al. 2024). However, along with these innovations, banks have introduced various electronic banking charges that customers incur while accessing digital services. These charges, ranging from transfer fees, ATM usage charges, SMS alerts, and maintenance fees to card renewal fees, have raised concerns regarding their implications for banks' financial performance and customer satisfaction (Ahmodu et al. 2024).

On the other hand, banks justify e-banking charges as necessary for the maintenance of digital infrastructure, cybersecurity systems, and innovations in service delivery. From a financial standpoint, these charges provide a crucial stream of revenue in a highly competitive and interest-rate-sensitive environment. For many banks, especially those in emerging markets, e-banking charges represent an opportunity to boost profitability without relying solely on traditional interest-based income (Hidayat et al. 2024). In many developing economies, particularly in sub-Saharan Africa, the introduction of e-banking charges is seen as a revenue diversification strategy by commercial banks amid declining interest margins (Alemu et al. 2025). Banks increasingly rely on non-interest income, including e-banking fees, to sustain profitability and remain competitive. While this shift may enhance financial performance indicators such as return on assets (ROA) and return on equity (ROE), it may also lead to customer attrition if perceived as exploitative (Uniamikogbo and Madumere 2021).

In addition, while banks justify such charges as necessary to maintain digital infrastructure and ensure service quality, they have sparked debates about their appropriateness, particularly in economies with high levels of financial exclusion and poverty (World Bank 2020). Critics argue that excessive charges can undermine the financial inclusion agenda and discourage the use of formal banking services, especially among low-income populations. In Nigeria, the issue of e-bank charges has become particularly contentious in recent years. In response, some regulatory bodies, such as the Central Bank of Nigeria (CBN), have intervened with caps on certain fees, promoting fair pricing to avoid exploitative practices while encouraging financial inclusion (Kwode 2024). Despite regulatory oversight, many customers continue to report dissatisfaction with the high frequency and lack of transparency of charges on digital transactions (Putrevu and Mertzanis 2023). This scenario raises a critical question: while e-banking charges may boost banks' short-term income, what is their broader impact on long-term financial performance and customer loyalty?

From a financial performance perspective, these e-banking charges are part of non-interest income, an increasingly important source of revenue for banks, given the volatility of interest-based income in the face of fluctuating monetary policies and market dynamics (Lawal et al. 2023; Handriani et al. 2025). Non-interest income, including income from e-banking, has the potential to diversify bank revenue sources, enhance profitability, and improve financial stability (Okolie and Eze 2023). For banks operating in competitive and technologically evolving environments, leveraging digital platforms and their associated fee structures can lead to increased returns on equity (ROE), net interest margins (NIM), and returns on assets (ROA).

Nonetheless, the relationship between e-banking charges and financial performance is not linear. Excessive or poorly structured charges can result in negative customer perceptions, reduce transaction volumes on digital platforms, and ultimately hurt bank profitability (Kassaye and Alamirew 2025). In emerging economies, where digital financial services have grown rapidly in the last decade, understanding the financial implications of e-banking charges is especially crucial. Many banks have embraced digital transformation as a core strategy; however, their profitability now partially hinges on how these digital services are priced (Senyo et al. 2024). Therefore, a well-balanced fee structure that enhances income without alienating customers is vital. Given this backdrop, there is a compelling need to investigate how electronic bank charges influence the financial performance of commercial banks, particularly in developing economies. Understanding this relationship is crucial not only for bank executives seeking to optimise revenue strategies but also for regulators committed to ensuring that digital financial services remain accessible and affordable.

The increasing adoption of electronic banking platforms by financial institutions has resulted in significant operational and strategic advantages. Banks have leveraged digital channels, such as mobile banking, Internet banking, point-of-sale (POS) services, and ATM services, to reach a broader customer base, reduce transaction costs, and enhance service delivery (Tonuchi et al. 2020). In contrast, there has been a rise in e-banking activities, which has led to a parallel surge in various e-banking charges imposed

on customers, including fees for fund transfers, ATM withdrawals, SMS alerts, card issuance, and account maintenance. Although these charges are intended to generate non-interest income and support infrastructural investments, they have raised critical concerns regarding their impact on banks' overall financial performance and long-term customer retention (Ibrahim and Ahmed 2022; Nwosu and Nwachukwu 2020).

A significant challenge lies in balancing the need to maximise bank revenue through service fees with the need to maintain customer satisfaction. While some banks experience increased profitability through non-interest income from these charges, there is growing evidence that excessive or opaque fee structures may deter customers from using digital platforms, potentially harming transaction volumes and customer loyalty (Okolie and Eze 2023). As such, high e-banking charges may undermine the financial inclusion agenda and increase public dissatisfaction with the formal financial sector (Bederer and Elhadj 2025).

Empirical findings on the relationship between e-banking charges and financial performance have been mixed. Some studies report a positive correlation, citing improved returns on assets (ROA) and equity (ROE) as a result of increased fee-based income (Okafor and Uchenna 2021; Abedifar et al 2018). Others argue that, in the long term, customer attrition and reduced usage of digital channels due to high charges can erode these gains Teka and McMillan (2020). Despite the growing reliance on digital revenue, limited scholarly attention has been paid to the comprehensive evaluation of how e-banking charges influence the financial performance of banks in emerging markets. Additionally, few studies have integrated the perspectives of both financial institutions and customers to offer a balanced analysis. This gap presents a compelling justification for the current study, which aims to assess the impact of e-banking charges on the financial performance of banks in Nigeria, focusing on profitability, customer engagement, and regulatory alignment. Specifically, the main objective of the study is to determine the role of electronic banking charges in the financial performance of deposit money banks in Nigeria. The study also examined customers' perceptions of electronic banking charges imposed by deposit money banks in Nigeria. Second, this study analyses the impact of electronic banking charges on the performance of deposit money banks in Nigeria.

LITERATURE REVIEW

E-Banking Charges

E-banking charges are fees levied by financial institutions for services accessed through electronic banking platforms, such as mobile banking, Internet banking, ATMs, point-of-sale transactions, and SMS alerts. These charges form part of non-interest income, which has become increasingly important to Nigerian banks as interest-based revenues become more volatile in a changing economic environment (Jolaiya 2023). With the rise in digital banking adoption, banks have introduced charges for virtually every electronic transaction. These include fees for mobile-app transfers, USSD usage, card maintenance, ATM withdrawals exceeding the allowable limit, and interbank transfers. These charges are regulated under the Central Bank of Nigeria's (CBN) Guide to Bank Charges, which is periodically updated to ensure fair consumer practices and promote financial inclusion (CBN 2022). Over the years, the CBN has developed policies and guidelines to curtail excessive bank charges in response to customer complaints (Chidi 2020). For instance, the CBN released guidelines on bank charges in 2004, 2013, 2017, and 2019 (CBN 2020). The 2019 bank charges guideline took effect on January 1, 2020. The bank charges guide of 2019 contained several readjustments to the 2017 guide. The apex bank has also made significant efforts to resolve bank-customer disputes regarding excess charges. For instance, the bank noted that it had resolved approximately 16,263 complaints received between 2012 and November 30, 2019. The bank also refunded a huge sum of ₦76.75 billion and $20.90 million to customers after they lodged several complaints.

Financial Performance

This refers to a business or a company's ability to generate profits from its operations. Profitability is a fundamental aspect of financial performance and a key indicator of a company's financial health, efficiency, and overall success (Wang and Prajogo 2024). This reflects the extent to which a company's revenues exceed its expenses, resulting in a positive bottom line and the creation of value for shareholders and other stakeholders. It is the capacity of a business or investment to generate profit or financial gain over a specific period. It is a measure of the effectiveness and efficiency of an organisation's operations in generating returns for its stakeholders, including shareholders, investors, and creditors (Brigham and Houston, 2020). Profitability is a key component of financial performance and indicates a company's ability to generate profits from its core business activities. Profitability ratios and measures help evaluate a company's efficiency, financial health, and potential for growth. Maintaining and improving profitability is essential for long-term sustainability and creating value for shareholders and stakeholders (Gibbons 2018). Profitability is a vital aspect of financial performance and serves as a critical measure of a company's success.

It assesses a company's ability to generate profits from its core operations, considering revenues and expenses (Corporate Finance Institute 2021).

E-Banking Charges and Financial Performance

The relationship between e-banking charges and financial performance can be understood through their different effects on ROA and ROE. E-banking charges represent a growing component of non-interest income that enhances profitability without a proportional expansion in physical assets, a pattern widely documented in studies on bank revenue diversification (DeYoung and Rice 2004; Berger 2003). Their positive contribution to ROA indicates improved asset utilization and operational efficiency, as digital platforms allow banks to generate scalable revenue at relatively low marginal costs, consistent with evidence that technological innovation improves banking productivity (Hernando and Nieto 2007). In contrast, the impact on ROE reflects the capacity of digital income streams to strengthen shareholder returns through profit amplification and financial leverage (Berger 2003). While ROA captures efficiency in converting assets into earnings, ROE emphasises value creation for equity holders, aligning with standard financial performance theory (Brigham and Houston 2019). Taken together, the joint improvement in ROA and ROE suggests that e-banking monetisation enhances both internal operational performance and external financial attractiveness. However, the stronger responsiveness of ROE compared to ROA may indicate that gains are partly driven by capital structure effects, underscoring the need for balanced growth that aligns profitability with sustainable asset management (Berger and Bouwman 2013).

Consequently, e-banking charges and financial performance are associated with a revenue-generation mechanism driven by pricing and transaction intensity. For Nigerian deposit money banks, electronic banking income emerges from the interaction between service charges (P) and transaction volumes (Q), such that higher digital usage combined with effective pricing policies expands fee-based revenue. This expanded revenue base contributes directly to profitability and strengthens key performance indicators. Prior banking studies have shown that growth in non-interest income is positively associated with bank efficiency and profitability (DeYoung and Rice 2004; Berger 2003). The positive association with ROA reflects improved asset efficiency, as banks are able to extract greater earnings from existing technological infrastructure, consistent with evidence that digital delivery channels enhance cost efficiency and productivity (Hernando and Nieto 2007). Simultaneously, the relationship with ROE highlights enhanced shareholder value, as incremental digital revenue increases net income relative to equity, reinforcing the linkage between fee-based banking innovation and equity performance.

While the neutrality of the money proposition suggests that nominal financial flows do not automatically translate into real productivity gains (Lucas 1972), the banking sector provides a practical channel through which revenue from electronic transactions can influence operational capabilities. The income generated from digital services supports investments in innovation, system reliability, and service quality, thereby reinforcing institutional efficiency. Empirical research on banking technology adoption indicates that electronic delivery systems are associated with sustained improvements in operational performance and competitive positioning (Berger 2003; DeYoung 2007). Thus, e-banking charges represent more than a pricing outcome; they form part of a broader performance ecosystem in which transaction activity, revenue expansion, and financial returns are mutually reinforced. This integrated relationship explains why growth in electronic banking services is consistently associated with stronger operational performance and improved equity returns in modern banking institutions.

EMPIRICAL REVIEW

The relationship between e-banking charges, adoption of electronic banking platforms, and financial performance has been widely investigated; however, the findings remain inconclusive due to methodological, contextual, and perceptual differences. Several studies emphasise the importance of customer perception in determining the effect of e-banking charges on profitability. Teka and McMillan (2020), using Structural Equation Modelling (SEM), found that perceived unfairness in charges discourages digital banking engagement, potentially undermining future profitability. While this study provides valuable insights into behavioural responses, its reliance on perception data rather than financial outcomes limits the generalisability of its conclusions to actual bank performance. Similarly, Ibrahim and Ahmed (2022), in a survey of 400 customers in Abuja and Lagos, reported that 62% of respondents considered e-banking charges excessive, which discouraged the use of mobile transfers. Although informative, the study is geographically limited to two urban centres and may not capture rural perspectives, where financial inclusion challenges differ. On a broader scale, Javaid (2021) confirmed in Pakistan that high charges reduced transaction volumes, particularly among low-income earners. While their findings highlight the equity concerns of e-banking pricing, they may not fully apply to Nigeria given contextual differences in income distribution and digital penetration. Conversely, Singh and Malhotra (2020) in India reported that standardised and transparent charges enhanced adoption and improved non-interest income, underscoring that customer trust

in pricing mechanisms can reverse negative perceptions. Taken together, these studies suggest that the effect of e-banking charges is not absolute but is conditional on the transparency of pricing and the socioeconomic characteristics of the customer base.

Beyond perception, other studies have directly linked e-banking charges to profitability indicators. Okafor and Uchenna (2021), employing panel data from ten Nigerian banks between 2010 and 2020, established a significant positive relationship between service charges and profitability (ROA and ROE). This evidence strongly supports the revenue-generating role of digital channels. However, the study did not account for possible long-term risks, such as customer attrition due to high charges. Similarly, Efuntade and Efuntade (2023) showed that ATM, USSD, and interbank transfer charges improved banks' net margins, with a unit increase in charges yielding a 0.8% increase in ROA. While this finding quantifies the benefit of digital charges, the focus on profitability alone ignores broader financial inclusion objectives. Vekya (2017), studying Kenyan banks, likewise confirmed that ATM and point-of-sale (POS) transactions significantly boost profitability, while Gundogdu (2017) showed that credit card usage had the strongest impact on profitability in Turkey. Both studies are useful in demonstrating the cross-country significance of digital channels; however, they primarily reflect post-adoption realities and do not assess potential trade-offs with customer accessibility or long-term sustainability.

Other scholars have adopted a more holistic view by considering the impact of e-banking adoption on overall bank performance rather than charges alone. In China, Yang et al. (2018) demonstrated significant improvements in ROA, ROE, and operating margins after e-banking adoption. While the longitudinal design strengthens causal inference, the focus on large Chinese banks limits comparability with smaller, resource-constrained banks in Africa. David and Kaulihowa (2018) in Namibia further found that electronic funds transfers and cheques significantly influenced profitability, though historical interbank settlements were more predictive of performance than current ones. This raises methodological concerns regarding the lag effects of digital adoption on profitability. Similarly, Harelimana (2017) reported that mobile banking positively influenced microfinance performance in Rwanda but recommended lower charges to encourage broader adoption. Although relevant for inclusion debates, these findings are limited to microfinance institutions rather than commercial banks. In India, Abbam et al. (2018) showed that IT expenditures positively impacted profitability; however, the study did not disaggregate between efficiency-driven costs and customer-facing charges, reducing its explanatory value for the pricing debate.

It is also important to recognise that bank choice and customer behaviour are shaped by non-charge factors. Tandoh (2021) identified ATM availability, loan accessibility, customer service, and branch networks as significant considerations for Ghanaian customers. Similarly, Aliero et al. (2018) found that interest rates and service speed were key determinants of bank choice in Sokoto, Nigeria. These findings suggest that while charges influence bank choice and profitability, customer loyalty may depend more on service quality, accessibility, and convenience. However, these studies are descriptive and do not provide strong empirical evidence linking these factors to financial performance.

Overall, the reviewed literature reveals both opportunities and threats. On the one hand, electronic banking charges provide a substantial and growing source of non-interest income, as evidenced in Nigeria, Kenya, and Turkey. On the other hand, when charges are perceived as excessive or exploitative, they discourage adoption, especially among low-income customers, thereby threatening long-term sustainability, as seen in Nigeria and Pakistan. The divergent findings across countries also indicate that contextual factors, such as income levels, regulatory frameworks, and pricing transparency, moderate the relationship between e-banking charges and financial performance. Existing studies are limited in three ways: first, many are either perception-based or profitability-focused, rarely integrating both dimensions; second, most adopt cross-sectional designs; and third, few studies explicitly examine the threshold at which charges shift from being revenue-enhancing to customer-discouraging. Addressing these gaps would deepen the understanding of the dual role of e-banking charges as both a revenue stream and a potential barrier to financial inclusion.

METHODS

Research design

The research study used mixed method where both primary and secondary data are sourced. This approach was deemed appropriate as the study examined the human side of issues concerning the nexus between e-banking charges and financial performance.

Sampling and data collection

Primary data were collected using structured questionnaires with close-ended questions. The drop-and-pick-up-later method of data collection was employed to provide respondents with sufficient time to respond to the questions in the study. For the purpose of primary data, the target population for this study consisted of all the residents in the Ijebu North local government in Ogun State. In addition, academic

institutions formed the sample population; however, simple random sampling was used to select respondents. The sample for this study comprised 200 residents who were selected by simple random sampling from the Ijebu-North Area of Ogun State for primary source data. *Simple random sampling was used because the questionnaires were distributed to different people as they visited the banks. Additionally, the respondents involved those that were literate because the majority opted for e-banking services as opposed to illiterates who preferred physical banking systems and formed the remaining number of respondents.* The major instrument was a questionnaire divided into three sections.

For secondary data collection, the population of the study consisted of all 14 (14) registered deposit money banks in Nigeria licenced by the Central Bank of Nigeria as of December 31, 2023. A sample size of 10 (10) deposit money banks, representing 71% of the population, was selected using the purposive sampling technique based on the availability and completeness of data and a similar regulatory framework covering a 10-year period of 100 panel data observations. The banks not selected lacked the required balanced data for analysis.

Data analysis

The independent variables are e-banking charges, and the control variables are the bank lending ratio and customer deposits. An econometric model by Karl Pearson (1894) was the bedrock upon which the model was specified to depict the nexus between e-banking charges (the independent variable) and financial performance (the dependent variable). The study used the E-views 10 statistical package to analyse the data. The mathematical equation below shows the relationship between the independent variable and the dependent variables in a linear form:

$$ROA_{it} = \beta_{0t} + \beta_1 EBC_t + \beta_2 BLR_{it} + \beta_3 CD_{it} + u_t \quad (1)$$

$$ROE_{it} = \beta_{0t} + \beta_1 EBC_t + \beta_2 BLR_{it} + \beta_3 CD_{it} + u_t \quad (2)$$

where:
ROA - Return on Asset i.e. (measured as Operating profit/ Total asset x 100)
ROE - Return on Equity i.e. (measured as Operating profit/ Shareholders Fund x 100)
EBC - E-Banking Charges Per Income i.e. (measured as Net Fees Commission Income/Total Operating Income)
BLR - Bank Lending Ratio i.e. (measured as Total Loans divided/ Total Deposits)
CD - Customer Deposits i.e. (Natural logarithm of Customers deposits of sampled bank)
μ - An error term of the model

RESULTS AND DISCUSSIONS

Analyses of Survey Data

Table 1. Demographic Characteristics of the Respondents

		Frequency	Percent (%)
GENDER	Male	99	49.0
	Female	101	51.0
	Total	200	100.0
AGE	16 – 25 years	140	70.0
	25 – 35 years	29	14.0
	35 – 45 years	17	9.0
	45 – 60 years	13	7.0
	Total	200	100.0
MARITAL STATUS	Single	172	86.0
	Married	28	14.0
	Total	200	100.0
DEPARTMENT	Commercial	68	34.0

		Frequency	Percent (%)
	Science	46	23.0
	Art	52	26.0
	Others	34	17.0
	Total	200	100.0
EDUCATIONAL QUALIFICATION	O'Level	66	33.0
	NCE/N.D	4	2.0
	B.Sc./H.N.D	95	48.0
	M.Sc.	25	12.0
	Ph.D.	11	5.0
	Total	200	100.0

Source: Author's computation (2025).

The results in Table 1 presents the demographic distribution of the respondents in this study and they provide a clear overview of the characteristics of the population surveyed. In terms of gender, the respondents were almost evenly split, with 99 males representing 49.0 percent and 101 females accounting for 51.0 percent of the total 200 participants. This reflects fairly balanced gender representation in the study. Regarding age, the majority of the respondents fell within the youthful bracket of 16 to 25 years, making up 70.0 percent of the sample. A smaller portion, 14.0 percent, were aged between 25 and 35 years, while those within the 35 to 45 years and 45 to 60 years categories represented 9.0 percent and 7.0 percent, respectively. This distribution suggests that younger individuals made up the bulk of the study population, indicating that electronic banking services may be more actively used or understood among younger demographics. In terms of marital status, a significant proportion of the respondents were single, constituting 86.0 percent, while only 14.0 percent were married. This further supports the youthful composition of the sample, as younger individuals are more likely to be unmarried. Looking at academic departments, respondents from commercial-related disciplines formed the largest group at 34.0 percent. This was followed by those from the arts at 26.0 percent, sciences at 23.0 percent, and others at 17.0 percent. This spread shows that the study captured a diverse academic background, with a slight leaning toward commerce-related fields, which may be relevant to perceptions of financial services.

Regarding educational qualifications, the largest proportion of respondents (48.0 %) held a B.Sc. or H.N.D qualification. This was followed by 33.0% who had an O'Level qualification, 12.0% with a Master's degree (M.Sc.), and a smaller number, 5.0%, with a Ph.D. Only 2.0% had an NCE or National Diploma. This indicates a relatively well-educated sample, with most participants having attained at least a tertiary level of education. The demographic profile of respondents suggests a youthful, academically diverse, and relatively well-educated group, which is well-positioned to engage with and provide informed opinions on electronic banking services and charges.

Table 2 presents the analysis of customer perceptions of electronic banking charges. It reveals a generally positive outlook among respondents regarding various aspects of digital banking costs. A significant proportion of customers agreed that they were well informed about electronic banking charges before transactions were processed, with a high mean score of 4.25 and a standard deviation of 1.22. Similarly, many customers found the methods used to calculate these charges easy to understand, as reflected in a mean of 4.18. Transparency appears to be moderately appreciated, with a mean of 4.10 suggesting that respondents generally consider the fee structures accessible and clear. However, concerns remain regarding disclosure, as a large number of customers believe that some electronic banking charges lack adequate explanations. This concern is underscored by a relatively high mean of 4.47, indicating strong agreement.

Regarding the perceived fairness and value of e-banking charges, respondents expressed that the fees reflect the quality of service received, as shown by a mean of 4.21. Service satisfaction appears to benefit from current e-banking charges, with a mean of 4.28, while the availability and ease of online banking software were also viewed favourably (mean = 4.15). Although most customers appreciate the convenience, a notable proportion indicated that high charges may affect their willingness to remain with their banks, with a mean score of 4.01. Some respondents agreed that reducing e-banking fees could increase the use of digital channels, as indicated by a high mean of 4.47. The communication of charges by deposit money banks was also rated positively, with a mean of 4.47, suggesting that banks make an effort to keep customers informed. Furthermore, the impact of charges on transaction decisions was highlighted, with a mean of 4.41.

While some customers expressed dissatisfaction with the cost of digital services (mean = 4.23), others noted that banks promptly communicate fee changes (mean = 4.28). Trust in banks' fair pricing practices received a moderately high rating (mean = 4.13). Many customers indicated a preference for physical banking to avoid e-banking fees (mean = 4.27) and acknowledged that perceived costs can affect the frequency of digital banking usage (mean = 4.18). The potential discouragement of consistent saving behaviour due to e-banking charges was also noted (mean = 4.31). Despite these concerns, customers strongly agreed that electronic banking enhances convenience, with one of the highest mean scores at 4.51. Most respondents also expressed the need for more effective regulatory oversight of these charges (mean = 4.54). Finally, respondents generally found electronic banking services satisfactory and worth recommending, irrespective of the fees, as reflected by a mean of 4.37. The responses reflect a positive but cautious perception of electronic banking charges, with an emphasis on transparency, fairness, convenience, and the need for better regulation. The findings of the study are in line with those of Ibrahim and Ahmed (2022), who found that customers in Abuja and Lagos perceive e-banking charges as excessive, leading to reduced usage of mobile platforms. The perception of high costs and its influence on customer behaviour was also reflected in the current study's survey responses. Singh and Malhotra (2020), however, observed that transparent and standardised charges encourage mobile banking adoption in India, aligning with this study's finding that clarity and fairness in pricing positively influence customer satisfaction.

Table 2. Customer Perception on Electronic Banking Charges

S/N	Items	Strongly Agree 5	Agree 4	Neutral 3	Disagree 2	Strongly Disagree 1	FX	Mean	Standard Dev.
1	Customers are generally informed about electronic banking charges before transactions are processed	640	140	18	42	10	850	4.25	1.22
2	The methods used to calculate e-banking charges are easy to understand	660	92	18	52	13	835	4.18	1.33
3	The fee structure for digital banking services is transparent and accessible to the public.	615	116	21	52	15	819	4.10	1.36
4	Some electronic banking charges lack adequate disclosure or explanation.	725	128	15	14	11	893	4.47	1.08
5	The fees charged for e-banking services reflect the value of the services delivered.	610	160	30	28	14	842	4.21	1.24
6	The current level of e-banking charges positively contributes to overall service satisfaction.	655	120	33	38	9	855	4.28	1.19
7	Availability and simplicity of online banking application software influence customer satisfaction	655	76	39	46	14	830	4.15	1.34
8	High electronic banking charges may influence customers' willingness to remain with their banks.	580	136	18	48	20	802	4.01	1.41
9	A reduction in e-banking fees could increase the usage of electronic channels.	710	132	21	26	5	894	4.47	1.01
10	Deposit money banks clearly communicate applicable e-banking charges to customers.	700	144	18	26	5	893	4.47	1.00
11	E-banking charges influence the decision to complete electronic transactions.	665	160	24	28	5	882	4.41	1.02
12	There is general dissatisfaction among customers owing to the cost of digital banking services.	580	180	39	40	6	845	4.23	1.13
13	Deposit money banks promptly communicate information on changes to electronic banking fees.	625	160	30	32	9	856	4.28	1.15
14	Deposit money banks are trusted to apply fair pricing practices to e-banking services.	620	104	48	40	14	826	4.13	1.31
15	Some customers may prefer physical banking options to avoid e-banking.	645	124	39	38	8	854	4.27	1.18
16	The frequency of digital banking usage is affected by the perceived cost of charges.	545	224	30	22	14	835	4.18	1.19
17	E-banking charges may discourage consistent savings behaviour among bank users.	620	188	21	20	12	861	4.31	1.14
18	Despite associated costs, e-banking services enhance the convenience of banking operations.	695	172	15	14	6	902	4.51	0.94
19	There is a need for more effective regulatory oversight of e-banking charges in Nigeria.	705	172	12	14	5	908	4.54	0.90
20	Electronic banking services are generally satisfactory and worth recommending, irrespective of fees.	670	136	33	26	8	873	4.37	1.10

Analyses of Econometric Model

Table 3. Descriptive statistics results

Statistics	ROA	ROE	EBC	CD	BLR
Mean	1.6500	12.8079	58.0208	72,608,040,000	0.5821
Median	1.1250	9.6000	57.9900	40,727,630,000	0.5800
Maximum	7.6000	50.6000	94.6500	287,099,430,000	0.9800
Minimum	0.0400	2.3000	16.5700	1,492,940,000	0.0900
Std. Dev.	1.3914	9.5210	15.1635	78,469,360,000	0.1556
Skewness	1.8274	1.2127	-0.3078	1.2986	-0.1064
Kurtosis	6.3095	4.4836	3.2109	3.5002	2.8950
Jarque-Bera	101.2943	33.6806	1.7640	29.1497	0.2345
Probability	0.0000	0.0000	0.4140	0.0000	0.8893
Sum	165.0000	1280.7900	5802.0800	726,000,000	58.2100
Sum Sq. Dev.	191.6608	8974.2300	22763.2200	6,100,000,000,000,000	2.3961
Observations	100	100	100	100	100

Source: Author's Computation (2025).

The analysis in Table 3 presents the descriptive statistics for the variables used in the study. The average value of ROA is 1.65%, with a maximum of 7.60% and a minimum of 0.04%. ROE has a mean of 12.81 percent, but with a maximum value of 50.6 percent and minimum of 2.3 percent which paints a picture of how much is returned equity components of their capital. E-banking charges (EBC) show a mean value of 58.02, indicating that more than 50% of operating income or profit is accounted for by e-banking charges from banks' customers. Customer deposits (CD) have the largest variation among the variables, with a mean of ₦7.26 billion, a maximum of ₦28.71 billion, and a minimum of ₦1.49 billion. Finally, the bank lending rate (BLR) has a mean of 0.5821, with a range spread from 0.09 to 0.98.

Table 4. Correlation coefficients results

	Return on Asset	Return on Equity	E-banking Charges	Customers deposits	Bank Lending Rate
ROA	1				
ROE	0.870844	1			
EBC	0.036832	-0.002900	1		
CD	-0.386942	-0.488539	-0.265874	1	
BLR	-0.001302	-0.071829	0.030624	-0.164617	1

Source: Author's Computation (2025).

Table 4 presents the correlation coefficients showing the strength and direction of the linear relationship among the variables. There is a strong and positive correlation between ROA and ROE (r = 0.8708), indicating that as return on equity increases, return on assets tends to rise as well. This suggests that both measures of profitability are closely related; however, they can be individually investigated. The relationship between ROA and EBC is weak and positive (r = 0.0368), implying that e-banking charges have a minimal direct association with returns on assets. This implies that as e-banking charges increase, returns on assets increase. Similarly, ROE and EBC show an extremely weak and negative relationship (r = -0.0029), indicating no meaningful linear association. Customer deposits (CD) show a moderate negative correlation with both ROA (r = -0.3869) and ROE (r = -0.4885). This suggests that higher deposit levels are associated with lower profitability ratios, which may reflect inefficiencies in fund utilisation or high associated costs. EBC and CD are also negatively correlated (r = -0.2659), implying that as customer deposits increase, e-banking charges tend to decrease, or vice versa. The relationship between EBC and BLR is weak and positive (r = 0.0306), indicating almost no linear association. Finally, the bank lending rate (BLR) is very weakly and negatively correlated with both ROA (r = -0.0013) and ROE (r = -0.0718), suggesting an insignificant influence of interest rate movements on profitability. Its relationship with CD is also weak and negative (r = -0.1646), further indicating a limited direct association. The correlation analysis reveals strong associations

between profitability indicators (ROA and ROE), whereas the other variables display mostly weak and negative relationships. These findings provide preliminary insights into the nature of the associations and help inform expectations for further regression analysis.

Pre-estimation Test

Table 5. Unit Root Test (Stationarity)

Unit Root (ADF - Fisher Chi-square)				
Variables	Level		1st Difference	
	Intercept	Intercept and Trend	Intercept	Intercept and Trend
ROA	0.5752	0.9922	0.2955	0.6221
ROE	0.7361	0.9675	0.2278	0.5610
EBC	0.0066	0.0057	0.0000	0.0000
CD	0.9998	0.9998	0.8895	0.9687
BLR	0.6956	0.0471	0.0013	0.3170
ROA, ROE and CD 2nd Difference				
	Intercept	Intercept and Trend		
ROA	0.0401	0.7373		
ROE	0.0126	0.3767		
CD	0.5868	0.9488		

Source: Author's Computation (2025)

The unit root test results presented in Table 5 were obtained using the ADF-Fisher chi-squared method to assess the stationarity properties of the variables in the study. Ensuring stationarity is essential to avoid spurious regression outcomes and enable valid statistical inference in panel data analysis. At the level, only E-banking charges (EBC) display strong evidence of stationarity, with statistically significant p-values under both the intercept-only ($p = 0.0066$) and intercept with trend ($p = 0.0057$) specifications. This suggests that EBC is stationary in its level form and does not require differencing. In contrast, return on assets (ROA), return on equity (ROE), customer deposits (CD), and bank lending rate (BLR) are not stationary at the level, as their p-values exceed the conventional 0.05 threshold. ROA and ROE remain non-stationary even at the first difference under both model specifications, with p-values still above 0.05. Customer deposits (CD) also fail to achieve stationarity at both levels and first differences. Upon further differencing, ROA and ROE attain stationarity at the second difference. ROA becomes stationary under the intercept-only specification ($p = 0.0401$), whereas ROE is stationary under the same specification with a p-value of 0.0126. This confirms their suitability for inclusion in the regression model after second-differencing. However, CD remains non-stationary even after second-differencing, as its p-values under both specifications ($p = 0.5868$ and $p = 0.9488$) are well above the 0.05 threshold.

In light of the mixed integration orders, with variables exhibiting I (0), I (1), and I (2) behaviour, this study adopts the generalised method of moments (GMM) estimator. The GMM is well suited to panel data structures that involve endogenous regressors, dynamic effects, and non-stationary series, as it employs internal instruments derived from lagged values of the variables. This approach enables the model to remain robust in the presence of persistent non-stationarity and serial correlation. Importantly, the GMM also allows the inclusion of variables such as CD, which would typically be excluded under conventional panel regression techniques because of their non-stationarity. By applying orthogonal deviation transformation and valid moment conditions, the GMM reduces bias and improves the efficiency of the estimation. Therefore, all variables, including EBC, CD, BLR, ROA, and ROE, are retained in the model and estimated using the GMM framework. This method ensures that the analysis remains comprehensive, reliable, and theoretically sound, despite the stationarity challenges identified during preliminary testing.

Post Estimation

Table 6. Electronic Banking Charges Effect on the Return on Assets (ROA)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROA (-1)	-0.387352	0.159316	-2.431352	0.0174
EBC	-0.358594	0.180672	-1.984783	0.0508
CD	-6.38E-09	9.82E-09	-0.650039	0.5176
BLR	0.001217	0.005207	0.233775	0.8158
Mean dependent var	-0.145175	S.D. dependent var		0.494855
S.E. of regression	0.533838	Sum squared resid		21.65875
J-statistic	5.681803	Instrument rank		10
Prob(J-statistic)	0.459761			

Source: Author's Computation, 2025

As shown in Table 6, the parameter estimates indicate that electronic banking charges (EBC) have a significant negative impact on ROA at a P-value = 0.05. This suggests that an increase in electronic banking charges is associated with a decrease in returns on assets. The statistical evidence rejects the null hypothesis; therefore, it is concluded that electronic banking charges have a measurable and negative impact on the returns on assets of DMBs in Nigeria. In addition, the lagged ROA (-1) also exhibits a statistically significant negative effect on the current ROA. The negative and statistically significant coefficient of lagged ROA indicates a mean reversion effect in firm performance. Firms with higher profitability in the previous period tend to experience a decline in the current period, suggesting that exceptional performance is not fully sustainable. This may reflect competitive pressures, operational adjustments, or the normalisation of temporary gains. However, the coefficients of customer deposits (CD) and bank lending rates (BLR) have no statistically significant effect on ROA.

Table 7. Electronic Banking Charges Effect on the Return on Equity (ROE)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROE (-1)	0.273326	0.08736	3.128743	0.0025
EBC	-14.70714	1.363569	-10.78577	0.0000
CD	1.55E-07	7.54E-08	2.057977	0.0430
BLR	-0.021966	0.03307	-0.664239	0.5085
Mean dependent var	-2.686382	S.D. dependent var		4.241237
S.E. of regression	5.069758	Sum squared resid		1953.386
J-statistic	6.013038	Instrument rank		10
Prob(J-statistic)	0.421731			

Source: Author's Computation, 2025

Compared with the other variables, the coefficient of electronic banking charges (EBC) is statistically significant, indicating a negative impact of EBC on financial performance measured by return on equity (ROE) at the 1% level. This negative and highly significant relationship suggests that increases in electronic banking charges lead to a substantial reduction in the return on equity of deposit money banks in Nigeria. In addition, the lagged dependent variable ROE (-1) has a positive and statistically significant coefficient, indicating that past values of ROE exert a meaningful influence on current ROE. Moreover, the parameter estimates of customer deposits (CD) show a statistically significant positive effect on ROE, implying that higher customer deposits contribute positively to shareholder returns. On the other hand, the bank lending rate (BLR) has an insignificant effect on ROE. Therefore, it can be concluded that electronic banking charges significantly influence the return on equity of deposit money banks in Nigeria, and the relationship is negative.

Ahmed and Khan (2021) found that excessive charges reduced transaction volumes among low-income customers in Pakistan, a result mirrored by the current finding that EBC negatively affects ROA and ROE. Similarly, the findings of this research support and extend existing knowledge, as concluded by Okolie and Eze (2023) that perceived unfairness in banking charges reduces digital engagement, which may

eventually harm banks' market reach and profitability. This is consistent with the present study, which shows a negative link between electronic banking charges and financial performance. In contrast, studies by Okafor and Uchenna (2021) and Efuntade and Efuntade (2023) presented a more favourable view of e-banking charges, arguing that they contribute positively to ROA and ROE because of their revenue-generating nature.

While this may hold true in theory or in earlier years of digital expansion, the current findings suggest that negative perceptions and financial strain from excessive charges could now be offsetting these benefits. Further support for the current findings (Harelimana 2017), who emphasised the role of transaction volumes in shaping the financial performance of MFIs in Rwanda, advocating for lower transaction charges. This reinforces the argument that while electronic banking charges can be a revenue stream, excessive fees may have the opposite effect by discouraging usage and weakening customer loyalty.

CONCLUSION

This study was conducted to examine the role of electronic banking charges in the financial performance of deposit money banks in Nigeria. Specifically, the research aimed to assess customers' perceptions of electronic banking charges imposed by deposit money banks in Nigeria. Second, it analysed the impact of electronic banking charges on the financial performance of deposit money banks in Nigeria. The findings from the analysis of customer perceptions indicated that respondents generally viewed electronic banking services positively. They believed they were well informed about applicable charges and found the methods of calculating these charges easy to understand. Nevertheless, there was concern over the adequacy and transparency of disclosures, and many customers indicated that a reduction in charges would encourage greater usage of digital platforms. There were also indications that high charges could influence customer loyalty and banking behaviour.

The econometric analysis revealed that electronic banking charges have a negative impact on the return on assets and return on equity of DMBs. The relationship with the return on equity was particularly significant, indicating that higher charges may reduce shareholder value. Customer deposits were found to positively contribute to financial performance, whereas bank lending rates showed no significant influence. In summary, this study found that although electronic banking is broadly accepted and convenient for customers, excessive charges can have adverse effects on bank profitability. The results highlight the need for banks and regulators to adopt fair-pricing strategies, improve transparency, and communicate more effectively with customers to ensure long-term sustainability and financial growth.

Based on the findings of this study, one of the recommendations is that banks should reassess the structure of their electronic banking charges to ensure that they are fair, justifiable, and aligned with the value of services provided. Excessive fees should be reduced to prevent negative impacts on profitability and customer loyalty. In addition, financial institutions must provide clear, consistent, and timely information on all applicable electronic banking charges. This will build trust and help customers make informed decisions regarding digital transactions. Financial institutions should maintain a certain portion of e-banking charges as investments in assets that will eventually boost the return on assets, with a similar approach for improvement in return on equity. Furthermore, banks should diversify revenue streams beyond electronic transaction charges by considering other investments, such as expanding digital financial services, offering value-added fintech products, and tapping into innovative investment opportunities that enhance profitability without burdening customers. This can enhance transaction volumes, customer retention, and ultimately improve long-term returns on equity.

It also recommends that banks design attractive savings and investment products, incentivise long-term deposits, and expand financial literacy campaigns to deepen customer engagement and deposit growth, as customer deposits significantly improve ROE. Concerning the positive influence of lagged ROE on current ROE, the study suggests that past performance strengthens future outcomes. Therefore, banks should reinvest earnings into different pools of investments that can sustain profitability momentum. It also recommends that regulatory bodies, such as the Central Bank of Nigeria, should enforce stricter guidelines on the disclosure and justification of e-banking charges. More effective monitoring will protect consumers and encourage healthy competition within the banking sector.

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Author contribution

• Conceptualization: Latifat Omolara Akano conceived the ideas and imagine the topic
• Methodology: Latifat Omolara Akano and Akeem Adekunle Adeyemi decided the suitable data source, data analysis technique and statistical package for the study.
• Software: Johnson Peter Chukwudi suggested and provided the software for the analysis.
• Validation: Latifat Omolara Akano ensured that the data collected were properly evaluated and rectified.
• Formal analysis: Latifat Omolara Akano and Johnson Peter Chukwudi jointly analysed the data based on the objectives.
• Investigation: Latifat Omolara Akano, Akeem Adekunle Adeyemi Johnson Peter Chukwudi carried out proper review of literature, came up with statement of problem and the gap filled by the study.
• Resources: Latifat Omolara Akano, gathered all resources needed for the study.
• Data curation: Latifat Omolara Akano and Johnson Peter Chukwudi did the collection, organising, cleaning and maintain the data.
• Writing – original draft: Latifat Omolara Akano and Johnson Peter Chukwudi were involved in the writing of manuscript.
• Writing – review & editing: Latifat Omolara Akano and Akeem Adekunle Adeyemi carried out the review and editing respectively.
• Visualization: Latifat Omolara Akano did the presentation of all tables and did the arrangement of the paper to fit into the template of the journal
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