International Journal of Financial, Accounting, and Management (IJFAM)
ISSN: 2656-3355, Vol 5, No 3, 2023, 323-341 https://doi.org/10.35912/ijfam.v5i3.1513

Exploring the influence of financial technology on banking services in Nigeria

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Article History
Received on 5 June 2023
1st Revision on 19 July 2023
2nd Revision on 26 July 2023
3rd Revision on 11 October 2023
Accepted on 13 October 2023

Abstract
Purpose: This study explored the impact of fintech on Nigerian banking services.
Research methodology: This study employed a quantitative research approach, analyzing data from the financial statements of selected Nigerian banks, and financial technology application statistics through econometric modelling and descriptive analysis.
Results: The study found that Fintech positively impacts Nigerian banks' traditional and market-based performance measures. For example, statistically, a 1 per cent increase in ATM transactions could increase banks' earnings per share by up to N4 on average. This implies that fintech adoption in the Nigerian financial system can increase efficiency, reduce costs, improve the customer experience, and enhance financial inclusion.
Limitations: This study had several limitations, such as the unavailability of data for some banks and the limited timeframe due to data unavailability.
Contribution: This study contributes to the growing body of literature on fintech in emerging markets by providing insights into Nigeria's evolving fintech landscape and its potential impact on traditional banking services.
Novelty: This study is one of the first to investigate the impact of fintech on Nigerian banking services based on selected case studies and the quantitative research approach employed. This study provides valuable insights for policymakers, regulators, and industry practitioners seeking to promote a conducive environment for fintech growth in Nigeria's banking sector.
Keywords: *Financial technology, banking services, Automated Teller Machine, Point of Sales, Online Payment Transactions*
How to Cite: Otonne, A., & Ige, O. T. (2023). Exploring the influence of financial technology on banking services in Nigeria. *International Journal of Financial, Accounting, and Management*, 5(3), 323-341.

1. Introduction

The financial industry is experiencing rapid evolution and innovation, with financial technology (fintech) emerging as a significant player. This growth is driven by factors such as the sharing economy (e.g., peer-to-peer platforms and online marketplaces), favorable regulations (e.g., consumer protection measures), and advancements in information technology (e.g., cloud computing and artificial intelligence) (Lee & Shin, 2018). Nigeria, a West African country, is actively transforming into a dynamic ecosystem that provides a platform for fintech start-ups to thrive and potentially become multi-million-dollar businesses. As one of Africa's major fintech investment destinations, Nigeria has witnessed a surge in deal activities in recent years. In 2010, only two deals were reported, but by September 2016, the number had increased to 14 deals. Based on activities in the first three quarters of 2022, Nigeria's fintech deal activity is projected to reach 86 deals in 2022, representing a 1 per cent increase from the previous year (Popoola et al., 2023). The increasing availability and adoption of

innovative fintech solutions, such as mobile money and digital banking, has promoted growth in these fintech deals.

Despite being predominantly cash-driven, the Nigerian economy has responded well to fintech opportunities, as evidenced by the exponential growth of mobile money operations from an average monthly transaction value of US$5 million in 2011 to US$142.8 million in 2016 (KPMG, 2017) and a funding value of US$537 million in 2021 (Atoyebi, 2022). By 2022, three Nigerian fintech companies received some of the largest equity investments in Africa. Flutterwave raised US$250 million, Interswitch raised US$110 million, and TeamApt raised US$50 million in equity investments in 2022 (Ironsi, 2023). The increasing penetration of fintech can be attributed to a surge in e-commerce and smartphone usage.

The emergence of fintech in Nigeria was facilitated by the introduction of universal banking in 2001, which allowed banks to offer a wide range of financial services beyond traditional deposit-taking and lending activities. Furthermore, the cashless policy implemented in 2011 by the Central Bank of Nigeria (CBN) in collaboration with the Bankers Committee aimed to provide mobile payment services to break down traditional barriers hindering financial inclusion, such as cost, distance, or documentation requirements. This policy also ensured secure and convenient financial services in urban, semi-urban, and rural areas across the country (Itah & Emmanuel, 2014). This policy shift towards retail banking and the use of e-banking channels have significantly improved financial inclusion. For example, the percentage of Nigerian adults with access to payment services increased from 21.6 per cent in 2010 to 70 per cent in 2020, access to savings increased from 24.0 per cent to 60 per cent, and access to credit increased from 2 per cent to 40 per cent (CBN, n.d.). Electronic banking, as a form of fintech solution, both as a delivery medium for banking services and as a strategic tool for business development, has gained widespread acceptance internationally and is rapidly gaining traction in Nigeria. According to Ovia (2001), more banks enter the market and leverage e-banking facilities to offer enhanced services and excel in a competitive banking industry. The adoption of e-banking has benefited not only ordinary customers but also the corporate world. The rapid development and global acceptance of e-banking and its products have strongly encouraged its penetration into Nigeria (Ovia, 2001). Fintech enables users to make instant payments, transfer funds, and pay bills using their mobile phones. This has greatly enhanced financial inclusion, particularly among the unbanked population who can now conduct transactions seamlessly without a traditional bank account. In addition, fintech lending platforms such as Carbon, Fairmoney, and Renmoney leverage technology to provide quick and accessible loans to individuals and small businesses. Moreover, insurtech startups such as AXA Mansard and Tangerine Life have introduced digital insurance solutions that offer convenience and customized coverage.

This study was motivated by the following factors. (1) The use of electronic payment technologies has generated conflicting opinions regarding bank performance in terms of profitability, expected returns, and risk exposure. For instance, many deposit money banks in emerging economies have seen an increase in profit without sustainable growth. However, the implementation of electronic payment technologies has reduced the returns of bank stakeholders and heightened their risk exposure. (2) the adoption of electronic payment technologies requires Nigerian banks to modify their business models, leading to higher operational costs during the transition phase. To compete with fintech companies in the country, several deposit money banks have made significant investments to support the advancement of electronic payment technologies (Mustapha, 2018). This highlights the growing disruptive influence of fintech firms on traditional banking practices and emphasizes the need to examine the contributions and risks of fintech in banking services, considering the limited research available on this subject matter. Studies on fintech in Nigeria have largely focused on its adoption, challenges, and benefits for financial inclusion. However, there are still significant research gaps in the understanding of the impact of fintech on the performance of banks in emerging economies. This study examines fintech in Nigeria and its impact on the performance of banks in the country. The remainder of this paper is organized into four sections. The next section provides a review of the related literature and develops the hypotheses. Section three outlines the methodology used in this study. Section four

analyses the data and discusses the findings, while the final section concludes with implications, recommendations for further research, and limitations.

2. Literature review

2.1. Conceptual Review

In 2017, the World Economic Forum characterised fintech as a disruptive and revolutionary force equipped with digital weapons that can dismantle traditional financial institutions and overcome barriers (Chinyamunjiko, Makudza, & Mandongwe, 2022). Bates (2017) a report commissioned by Consumers International, Bates (2017) describes fintech as the convergence of financial services and technology. Fintech encompasses financial firms that base their services on robust technological platforms to create innovative financial products and services that cater to a broader range of customers, including both corporations and individuals (Mlanga, 2019). The rise in fintech can be attributed to its adoption by start-up companies seeking to disrupt traditional methods by leveraging advanced technological channels in areas such as asset management and money transfer (Truong, 2016). One notable aspect of fintech is its ability to enhance market efficiency while lowering transaction costs. Banking services include a wide range of financial activities that banks offer such as deposit accounts, loans, payment processing, money transfers, and other related services provided to individual and corporate customers.

2.2. Empirical Review

Beyond these concepts, the impacts, opportunities, and challenges of fintech have been extensively explored in research studies conducted by various scholars. Kim, Park, Choi, and Yeon (2015), Truong (2016), Saksonova and Kuzmina-Merlino (2017), Leong, Tan, Xiao, Tan, and Sun (2017), Kolesova and Girzheva (2018), and Pejkovska (2018) are among the researchers who have contributed to the understanding of fintech's disruptive influence in the global financial sector using different areas as case studies.

Kerényi and Molnár (2017) examined the influence of technological progress, internet proliferation, and digitalisation on traditional banking business models and the impact of the growing fintech sector on different areas of the banking industry. The authors highlight the increasing prominence of fintech solutions, which have gained support from both consumers and the supply side. They provide descriptions of new fintech solutions and present successful examples of payment and lending services. However, they cautioned that although these new players and solutions have brought several innovations to the market, they also pose potential dangers. The study concludes that fintech firms are unlikely to radically change financial intermediation.

Kim et al. (2015) examined the acceptance of payment-type fintech services and the factors influencing their adoption. The authors utilized the Elaboration Likelihood Model proposed by Petty and Cacioppo (1986), as well as variables associated with the Technology Acceptance Model, and observed that convenience and usefulness are the most significant factors in determining the adoption of payment-type fintech services, suggesting that as individuals seek convenience in their financial transactions, the ease and efficiency offered by payment-type fintech services become essential factors influencing their adoption. From an institutional perspective, the study emphasized the significance of government deregulation and enhanced security measures to promote the use of payment-type fintech services. Similarly, Truong (2016) examined the innovative aspects of fintech, which has rapidly penetrated financial markets by addressing the gaps left by traditional financial institutions and enhancing user experience. Using primary data sourced from financial market research corporations such as PwC, Capgemini, and KPMG, this study confirmed the growing role of fintech in modern economies and noted that financial institutions face exceptional challenges in adapting to technological advancements.

Taking a regional view, Saksonova and Kuzmina-Merlino (2017) examine the level of fintech development in Latvia compared with that in Europe. The study identified financial services offered by fintech companies that use innovative technologies and compared their advantages and disadvantages with services provided by traditional financial sector companies, such as banks, insurance companies, and asset management institutions. The results showed that Latvian society prefers traditional banking

to fintech services. The survey results corroborated the finding that Latvians lack awareness of fintech services, including innovations and new financial products. In a similar study conducted in Ireland, Gibson (2015) used a qualitative research approach, specifically structured interviews with industry experts, as the primary data collection technique, and found that fintech was then in its nascent stages but was poised to bring about a dual transformation within the industry. The author observed that it would disrupt the traditional business model while simultaneously collaborating with established financial service providers, leading to a paradigm shift in the industry as a whole.

Leong et al. (2017) conducted a qualitative study in China focusing on a fintech company that offers micro-loans to college students. The authors observed that businesses can leverage digital technology to secure a market niche in the financial sector, create alternative credit scores using non-traditional data, and enhance financial inclusion by reaching previously marginalized market segments. Moreover, the study further showed that as technology reduces transaction costs, fintech startups can provide small loan services. An example of this was presented in the case of 007fenqi, a Chinese fintech startup specializing in offering college student micro-loans.

Adepetun (2017), who also analysed data from the PwC Nigeria fintech Survey 2017, examined the potential impact of fintech on market players and identified the opportunities that arise from its adoption. According to the survey, Nigerian financial service players view changing customer needs as the primary impact of fintech on their businesses. A significant portion of respondents (up to 60 per cent) believed that up to 40 per cent of financial services businesses would be at risk from standalone fintech companies by 2020. The survey highlighted retail banking and fund transfers as sectors with the highest likelihood of disruption, with rates of 92 per cent and 85 per cent, respectively. This suggests that fintech companies are altering the business models of traditional banking institutions and displacing incumbent market leaders. Kolesova and Girzheva (2018) reviewed various articles from reputable journals, international documents, and expert opinions to identify the risks that financial technologies pose to the banking sector. The authors find that most fintech services are provided by non-bank companies, posing significant competition for traditional banks and necessitating changes in their business models. The study also identified risks associated with the slower development of fintech regulatory mechanisms compared to the pace of fintech itself. Specifically, the authors argue that the lack of an adequate regulator leads to non-compliance with laws and the emergence of fraudulent schemes.

Guo and Zhang (2023) examined the effect of bank fintech on liquidity creation using data from Chinese commercial banks. They find that banks with greater fintech development create more liquidity through deposit inflow, risk management, and cost-efficiency channels. The positive impact of bank fintech on liquidity creation is more significant for non-state-owned, unlisted banks with less liquidity creation. Zhao, Goodell, Wang, and Abedin (2023) discovered functional differences in the impact of fintech on bank risk-taking. According to the authors, payment and settlement technology, capital-raising technology, and investment management technology are positively correlated with bank risk-taking, whereas market facility technology is negatively correlated. The authors also find that macroprudential policies influence the relationship between fintech and bank risk-taking. This position resonates with Boot, Hoffmann, Laeven, and Ratnovski (2021) argument that fintech increases bank risk taking, particularly because of the rise in online lending. However, other studies suggest that fintech can alleviate risks for commercial banks by complementing their business models (Begenau, Farboodi, & Veldkamp, 2018; Cheng & Qu, 2020).

Despite the mixed findings regarding the impact of fintech on the financial performance of banks, there is a significant gap in the literature concerning how the increasing adoption of fintech will influence the performance of Nigerian banks, specifically the Access Bank and Guaranty Trust Bank, which are two prominent financial institutions in the Nigerian banking industry. Previous studies have predominantly focused on the growth, dynamics, and impact of fintech on the traditional metrics of commercial bank performance. However, little attention has been devoted to examining the specific role of fintech in relation to market-based measures of financial industry performance. To date, no known study has

explored how the adoption of fintech by these banks affects both market-based performance measures and traditional performance metrics. By shedding light on these critical aspects, this study endeavors to provide a comprehensive understanding of the interplay between fintech, bank management, and market considerations. This research gap is precisely addressed in this study, thereby making a valuable and substantive contribution to the existing body of knowledge in this field.

2.3. Research Hypothesis

This study proposes the following hypothesis:

H_{0_1}: Fintech does not significantly affect banks' traditional performance in Nigeria.

H_{0_2}: Fintech does not have a significant effect on banks' market-related performance in Nigeria.

3. Research methodology

3.1. Theoretical Framework: Social Construction Theory of Technology

The social construction theory of technology provides a theoretical foundation for this study. Rapid advancements in financial technology (fintech) have revolutionized the banking and financial services industry, presenting both challenges and opportunities for traditional banks. To gain a comprehensive understanding of the relationship between fintech and financial services, this study employs 's (1984) (Pinch & Bijker, 1984) theory of social construction of technology as the primary analytical framework. According to this theory, the manner in which individuals perceive and employ mobile technology is not predetermined by the technology itself; rather, it is shaped by people's choices and actions (Klein & Kleinman, 2002). The theory underscores the significance of comprehending how technology becomes socially integrated within society to fully grasp its usage. Technology can assume diverse meanings, and its adoption varies depending on the social context and society's perception of it (Bijker, 2008; Tushman & Anderson, 1986). The adoption of technology is not solely driven by technical superiority; it is also profoundly influenced by social factors (Tushman & Anderson, 1986). In the context of this study, the adoption of mobile phone technology, particularly mobile phone financial services, has been influenced by factors related to business, banking service requirements, and social networks associated with both business and family. Thus, the theory underscores the importance of understanding how fintech becomes socially integrated in the banking sector (Klein & Kleinman, 2002).

In this study, relevant social groups include financial institutions, regulators, customers, technology developers, and industry associations. Each group brings a unique set of interests, values, and concerns, which significantly influence the development and implementation of fintech solutions. Power dynamics are also an inherent aspect of the social construction theory. This theory acknowledges that certain social groups possess more power and influence than others in shaping technological outcomes (Bray, 2014). Traditional banks and financial institutions may exert substantial control over the direction and pace of fintech adoption, whereas startups and innovative disruptors may occasionally challenge existing power structures. Social construction theory provides an understanding of these power dynamics and is essential for comprehending the resistance, acceptance, or transformation of traditional banking practices in response to fintech advancements.

By comprehending how fintech becomes socially integrated within society, encompassing its adoption driven by business factors and social networks, this theory establishes a robust foundation for the examination of the intricate dynamics between fintech and traditional banking within the evolving landscape of financial services. Using social construction theory as the theoretical framework, this study associates financial technology indicators such as point-of-sale (POS) transactions, mobile money transfers, online payment transactions, and ATM transactions with the performance of banking and financial services.

3.2. Sources and Measurement of Data

For this study, quarterly data from 2012 to 2019 were utilized, sourced from the Central Bank of Nigeria (CBN) payment system statistics and the financial statements of selected banks. The sample period was selected to coincide with the significant events in the Nigerian banking sector. For example, in 2012, the Central Bank of Nigeria introduced financial inclusion, marking the expansion of fintech payments

beyond traditional electronic banking. In addition, 2019 was selected as the endpoint of the sample period because of potential disruptions in the performance indicators and payment system data caused by the COVID-19 pandemic. It is important to note that there were not enough data points to categorize the sample into separate groups or to accommodate specific structural breaks. Future research in this field could investigate how structural breaks affect the models (Otonne, Melikam, & Ige, 2023). Payment system data, which encompass fintech transactions such as point-of-sale (POS) transactions, mobile money transfers, online payments, and ATM transactions, were obtained from the Central Bank of Nigeria database. Financial statements are used to calculate the relevant financial ratios aggregated across the chosen banks. The study focuses on two-tier banks in Nigeria, namely Access Bank and Guaranty Trust Bank, as case studies because they have large market capitalization, are big on fintech adoption, and are quoted on the stock market (Anoke, Okafor, & Onu, 2023). Market-based performance was assessed using the price-earnings ratio (P/E ratio) and earnings per share (EPS), while traditional financial performance was measured using return on equity (ROE) and return on assets (ROA).

The P/E ratio is calculated by dividing the market price per share by earnings per share. EPS, or earnings per share, is derived by dividing the net profit after tax attributable to shareholders by outstanding shares (Rahmawati & Hadian, 2022). ROE, or return on equity, is determined by dividing the net profit after tax by shareholder equity (Tosin & Otonne, 2019). Finally, the return on assets (ROA) is calculated by dividing the net profit after tax by total assets (Tharu & Shrestha, 2019; Tosin & Otonne, 2019).

The price–earnings ratio (P/E ratio) as a market-based performance measure indicates investors' expectations. A high P/E ratio indicates that investors anticipate a higher future growth. Because fintech innovations increase banking service efficiency, reach, and quality, they are likely to attract more customers and generate more income, leading to increased earnings.

Earnings per share (EPS) as a market-based performance measure also indicates profitability per outstanding share of a company's stock (Olayinka, 2022). If Fintech is effectively implemented and utilized, it could reduce operational costs and increase earnings, leading to a higher EPS.

Return on equity (ROE) is a measure of financial performance that represents a corporation's profitability in relation to stockholders' equity. Adopting Fintech could boost efficiency and profitability, thereby increasing the ROE. Return on assets (ROA) indicates how profitable a company is relative to its total assets and provides an idea of how efficient management is at using its assets to generate earnings. Improved efficiency from fintech implementation may increase the ROA.

Point-of-sale (POS) transactions measure the value of transactions occurring through POS systems. The introduction of fintech can streamline and boost the number of transactions, which could influence banks' performance metrics.

Mobile money transfers (MOB) capture the number of mobile money transfers. As fintech enhances the ease and speed of such transfers, it can increase the customer base and income, thus influencing performance.

Automated Teller Machine transactions (ATM) represent the value of ATM transactions, which could increase with the implementation of fintech due to improved services and convenience, affecting banks' earnings and profitability.

Online payment transfer (OPT) indicates the value of online payment transfers, which can be boosted by fintech services that offer easy, quick, and secure transactions. This increase can, in turn, positively reflect bank performance.

3.3. Model Specification

Adapting Otonne et al. 's (2023) model, the functional representation of the model that captures the relationship between financial institutions and fintech is presented below.

$$ROE_t = f(POS, MOB, ATM, OPT) \quad (1)$$
$$ROA_t = f(POS, MOB, ATM, OPT) \quad (2)$$
$$EPS_t = f(POS, MOB, ATM, OPT) \quad (3)$$
$$PER_t = f(POS, MOB, ATM, OPT) \quad (4)$$

Models (1)–(4) are further represented in econometric forms as

$$ROE_t = \gamma_1 + \beta_1\, logPOS_t + \delta_1 logMOB_t + \alpha_1 logATM_t + \theta_1 OPT_t + \varepsilon_1 \quad (5)$$
$$ROA_t = \gamma_2 + \beta_2\, logPOS_t + \delta_2\, logMOB_t + \alpha_2\, logATM_t + \theta_2 OPT_t + \varepsilon_2 \quad (6)$$
$$EPS_t = \gamma_3 + \beta_3\, logPOS_t + \delta_3\, logMOB_t + \alpha_3\, logATM_t + \theta_3 OPT_t + \varepsilon_3 \quad (7)$$
$$PER_t = \gamma_4 + \beta_4\, logPOS_t + \delta_4\, logMOB_t + \alpha_4\, logATM_t + \theta_4 OPT_t + \varepsilon_4 \quad (8)$$

The anticipated impact analysis indicates a positive expectation for all coefficients, denoted by $\beta i>0$, $\delta i>0$, $\alpha i>0$, and $\theta i>0$, where i corresponds to Models 1–4. The following variables are defined:

logPOS: logarithm of the value of point-of-sale transactions.
logMOB: logarithm of the value of mobile money transfer
logATM: logarithm of value of automated teller machine transactions
logOPT: logarithm of value of online payment transfer
ROA: return on assets
ROE: return on equity
EPS: Earnings per share
PER: price earning ratio

3.4. Estimation Technique and Procedure

The estimation technique employed in this study was the autoregressive distributed lag (ARDL) model, which was chosen for its distinct advantages. First, unlike static estimation techniques that only account for long-run or fixed effects, the ARDL model allows for both short- and long-run effects of the independent variable on the dependent variable. Second, it provides an alternative approach to examine the long-run equilibrium relationship, known as the bound test, which differs from the traditional residual-based cointegration test used in the univariate analysis. Unlike other techniques that only allow for I (1) variables, the bound test offers flexibility by accommodating both the I(0) and I(1) variables.

The ARDL model incorporates the lags of both the dependent variables (autoregressive terms) and explanatory variables (distributed lag terms). ARDL models are represented as ARDL (p, q1.... qK), where p represents the number of lags of the dependent variable, q1 denotes the number of lags of the first explanatory variable, qK signifies the number of lags of the kth explanatory variable, and K represents the total number of explanatory variables (X1.XK). The models were estimated using Eviews software version 11.

4. Result and discussion

4.1 Descriptive Statistics

The descriptive results of the variables are presented in Table 1. The table provides an analysis of the data, including measures such as the mean, standard deviation, coefficient of variation, and Jarque-Bera statistics.

Table 1. Summary of Descriptive Statistics

ACCESS BANK (Access)					
Variable	No. of Observations	Mean	Standard Deviation	Coefficient of variation (%)	Jarque-Bera statistic
	29	1.301379	1.089730	83.74	214.0052 [0.000000]

	29	9.408966	7.786811	82.76	55.54541 [0.000000]
	29	0.019310	0.020342	105.34	539.2916 [0.000000]
	29	0.746897	3.426221	458.73	823.3449 [0.000000]
GAURANTY TRUST BANK (GTBank)					
Variable	No. of Observations	Mean	Standard Deviation	Coefficient of variation (%)	Jarque-Bera statistic
	29	3.115172	3.608985	115.85	276.2238 [0.000000]
	29	14.20103	9.232232	65.01	3.230701 [0.198821]
	29	0.033793	0.036294	107.40	273.9105 [0.000000]
	29	0.204138	0.160880	78.81	39.00080 [0.000000]
PAYMENT STATISTICS					
Variable	No. of Observations	Mean	Standard Deviation	Coefficient of variation (%)	Jarque-Bera statistic
	29	1100.315	419.9876	38.17	1.974713 [0.372560]
	29	41.92414	52.94265	126.28	74.55096 [0.000000]
	29	212.2583	215.0088	101.30	5.433461 [0.066090]
	29	163.8962	152.5139	93.06	7.513239 [0.023363]

Note: The values in the block brackets [ ] are probabilities.
Source: Author's computation

Table 1 presents the study's descriptive statistics and reveals that, on average, ATM transactions amount to N1,100.32 billion, OPT transactions to N41.92 billion, POS transactions to N212.26 billion, and MOB transactions to N163.90 billion. In terms of the coefficient of variation, OPT transactions exhibit the highest volatility, whereas ATM transactions are least volatile. The Jarque-Bera statistic indicates that at a 5 per cent level of significance, all payment systems except ATMs are not normally distributed. The table also shows statistics on the conventional and market-related performance of the selected banks.

The average earnings per share during the period under consideration for Access Bank is N1.30k per share, with a price-to-earnings ratio of N9.40k, indicating that average-priced investors are willing to pay for N1 in earnings. The average return on assets and return on equity for the bank are 1.93 per cent and 74.69 per cent, respectively. The return on equity is the most volatile performance indicator, while the price-to-earnings ratio exhibits the least volatility. According to Jarque-Bera statistics, none of the series is normally distributed at a 5 per cent level of significance. In the case of the Guaranty Trust Bank, the average earnings per share during the period under consideration is N3.12k per share, with a price-to-earnings ratio of N14.20, indicating that the average price investors are willing to pay for N1 in earnings. The average returns on assets and returns on equity for the bank are 3.38 per cent and 20.41 per cent, respectively. Earnings per share is the most volatile performance indicator, whereas the price-to-earnings ratio exhibits the least volatility based on the coefficient of variation. The Jarque-Bera statistics reveal that none of the series is normally distributed at a 5 per cent level of significance.

4.2 Unit Root Test Result

To further assess the properties of the variables, we examine the stationarity level of the series. This is essential for time-series analysis to avoid spurious results. This study employed the Augmented Dickey-Fuller stationarity test to examine the stationarity properties of the variables.

Table 2. Results of the ADF Unit Root Test

Variable	Level	First Difference	Order of integration
eps_access	-2.047582[a]	-5.842864***[a]	I(1)
per_access	-2.772464[b]	-6.614044***[a]	I(1)
roa_access	-3.255000**[a]	……‡	I(0)
roe_access	-1.795928[a]	-6.761524***[a]	I(1)
eps_Gtbank	-4.933012***[b]	……‡	I(0)
per_Gtbank	-4.894357***[a]	……‡	I(0)
roa_Gtbank	-4.733297***[a]	……‡	I(0)
roe_Gtbank	-0.912572[b]	-11.47493***[b]	I(1)
Vatm	-1.989434a	-5.318426***a	I(1)
Vopt	-4.189749***b	……‡	I(0)
Vpos	-1.884141***b	-10.06789***a	I(1)
Vmob	-4.535700***a	……‡	I(0)

Note: ***, **, and * indicate the rejection of the null hypothesis of a unit root at 1%, 5%, and 10%, respectively; ‡ implies that a series that is stationary at levels does not require its first difference being reported; b and a denote models with intercept and trend, and models with intercept only, respectively.
Source: Author's computation

Table 2 presents the results of the ADF unit root test. The results indicate that, at the 5 per cent level of significance, both the value of ATM and POS transactions become stationary after the first difference. However, the MOB and OPT values remained stationary. All series are integrated at order zero or stationary at levels for GTBank, except for the return on equity series, which becomes stationary after taking the first difference. However, all the series become integrated after the first difference for Access Bank, except for the series on ROA, which is integrated at order zero or stationary at levels. It is worth noting that only the ADF statistics from the test regressions with significant results are reported out of the three regressions conducted (model with intercept and trend, model with intercept, and model with none). Furthermore, because the series is either I (0) or I (1) and there is no I (2) series, we can proceed with a linear autoregressive distributed lag model.

4.3 ARDL Co-integration Test Results

The test for the presence of a long-run equilibrium relationship in Access Bank's models is demonstrated using the ARDL cointegration test in Table 3. The Gtbank models are demonstrated using the ARDL cointegration test presented in Table 4. Model 1 examines the relationship between fintech (represented by payment statistics) and return on equity. Model 2 explores the relationship between fintech and return on assets (ROA). Model 3 investigates the relationship between fintech and earnings per share, while Model 4 delves into the relationship between fintech and the price-earnings ratio.

Table 3. Results of ARDL Co-integration Test for the Access Bank

Access Bank			
Model 1: $ROE_t = f(POS, MOB, ATM, OPT)$			
F-stat	3.181440		
Critical Values			
Significance levels	I0 Bound	I1 Bound	
10%	2.45		3.52
5%	2.86		4.01
2.5%	3.25		4.49
1%	3.74		5.06
Model 2: $ROA_t = f(POS, MOB, ATM, OPT)$			
F-stat	58.68950		
Significance levels	I0 Bound	I1 Bound	
10%	2.45		3.52
5%	2.86		4.01
2.5%	3.25		4.49
1%	3.74		5.06

Model 3: $EPS_t = f(POS, MOB, ATM, OPT)$				
F-stat	14.58507			
Critical Value				
Significance levels	I0 Bound		I1 Bound	
10%		2.45		3.52
5%		2.86		4.01
2.5%		3.25		4.49
1%		3.74		5.06
Model 4: $PER_t = f(POS, MOB, ATM, OPT)$				
F-stat	9.549579			
Critical Values				
Significance levels	I0 Bound		I1 Bound	
10%		2.45		3.52
5%		2.86		4.01
2.5%		3.25		4.49
1%		3.74		5.06

Source: Author's Computation

Table 3 presents the cointegration results for the Access Bank. Model 1 examines the relationship between fintech (represented by payment statistics) and return on equity and concludes that there is no long-run equilibrium relationship based on the F-statistic being lower than the upper bound of the critical values at a 10 percent level of significance. Model 2, which explores the relationship between fintech and return on assets, shows that the F-statistic exceeds the upper bound (I1) critical value at a 1 per cent level of significance, indicating the presence of a long-run equilibrium relationship between return on assets, the value of ATM transactions, the value of MOB, the value of OPT, and the value of POS in access banks. A similar result was obtained for Models 3 and 4, also at the 1 per cent level of significance. This implies that a long-run equilibrium relationship exists between earnings per share, the price-to-earnings ratio, and the selected payment financial technologies, including the value of ATM transactions, MOB, OPT, and POS transactions in the Access Bank.

Table 4. Results of the ARDL Co-integration Test for GTBank

GTBank				
Model 1: $ROE_t = f(POS, MOB, ATM, OPT)$				
F-stat	11.02125			
Critical Values				
Significance levels	I0 Bound		I1 Bound	
10%		2.45		3.52
5%		2.86		4.01
2.5%		3.25		4.49
1%		3.74		5.06
Model 2: $ROA_t = f(POS, MOB, ATM, OPT)$				
F-stat	1.355242			
Significance levels	I0 Bound		I1 Bound	
10%		2.45		3.52
5%		2.86		4.01
2.5%		3.25		4.49
1%		3.74		5.06
Model 3: $EPS_t = f(POS, MOB, ATM, OPT)$				
F-stat			4.817328	
Critical Value				
Significance levels		I0 Bound		I1 Bound
10%		2.45		3.52
5%		2.86		4.01

2.5%	3.25	4.49
1%	3.74	5.06
Model 4: $PER_t = f(POS, MOB, ATM, OPT)$		
F-stat	10.57431	
Critical Values		
Significance levels	I0 Bound	I1 Bound
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

Source: Author's Computation

Table 4 shows the cointegration results for all models for GTBank. Since the f-statistics are greater than the upper bound for Model 1 at the 1 per cent level, there is a long-run co-integration relationship between return on equity, value of POS, value of MOB, value of ATM, and value of OPT transactions in GTBank. This implies that these variables move in the long run. Model 2, which shows the relationship between the payment statistics and return on assets, indicates that since the F-statistic is less than the upper bound (I1) critical value at the 10 per cent level of significance, it can be concluded that a long-run equilibrium relationship is not present between return on assets, value of ATM transactions, value of MOB, value of OPT, and value of POS in GTBank. The implication of this result on the empirical estimation of Model 2 is that only the short-run results will be presented because there is no co-integration; therefore, the long-run coefficient or impact is insignificant. A similar result is obtained for Models 3 and 4, which shows that there is co-integration between earnings per share, on the one hand, price-earnings ratio, on the other hand, and payment technologies at the 5 per cent and 1 per cent levels of significance, respectively. The implication of this is that there is a long-run equilibrium relationship between earnings per share and the price earnings ratio and the selected payment financial technologies, which include the value of ATM, MOB, OPT, and POS transactions in GTBank.

4.4. ARDL Regression Results

4.4.1 Regression Results for ACCESS BANK

The regression estimates of the models for ACCESS BANK are presented in Table 5. The results comprise the short- and long-run ARDL estimates, vital statistics such as R^2 and F-statistic, and post-estimation tests including normality, serial correlation, and heteroscedasticity tests. For Model 1, which examines the relationship between return on equity and fintech, only the short-run estimates are presented because of the absence of a long-run equilibrium relationship.

Table 5. ARDL Estimates for ACCESS BANK

Short-run estimates				
Dependent variable	Δroe_access_t	Δroa_access_t	Δeps_access_t	Δper_access_t
D ((-1))	0.320096(0.1845)	-	-	-
D ((-2))	0.017989***(0.0069)	-	-	-
D ((-3))	-	-	-	-
D(VATM)	0.141764(0.2070)	0.045316**(0.0264)	4.287026***(0.0021)	-6.095900 (0.7303)
D (VATM (-1))	-0.226696*(0.0748)	-	-	-
D (VATM (-2))	-	-	-	-
D(VMOB)	0.017580 (0.4515)	0.000547 (0.8765)	-0.057073(0.7989)	-8.038408**(0.1751)
D (VMOB (-1))	-0.079734(0.1394)	-	-	1.521457***(0.0005)

D (VMOB (-2))	-0.079734(0.2346)	-	-	-
D(VOPT)	0.053172*(0.0937)	0.003810(0.4347)	0.761057**(0.0251)	-5.557290 (0.2306)
D (VOPT (-1))	-	-	-	8.360601***(0.0144)
D (VOPT (-2))	-	-	-	-
D(VPOS)	0.153932 (0.1637)	-0.008542(0.4405)	0.242528(0.7815)	-4.121055(0.1936)
D (VPOS (-1))	-0.384059**(0.0120)	-	-	-3.370131***(0.0056)
D (VPOS (-2))	0.225575*(0.0569)	-	-	-
CointEq(-1)	-	-0.998138***(0.0000)	-0.131633***(0.0000)	-0.838710***(0.0001)
C	0.555346(0.4515)	-0.059108(0.6477)	-5.271098 (0.5308)	-47.35059 (0.3488)
Long-run estimates				
Dependent variable	roe_access$_t$	roa_access$_t$	eps_access$_t$	per_access$_t$
VATM	-	0.014331(0.5540)	0.737304 (0.5906)	18.059637 (0.5057)
VMOB	-	0.000548(0.8770)	-0.050435***(0.0000)	-31.216350**(0.0063)
VOPT	-	0.003817(0.4176)	0.672530**(0.0136)	-27.035119**(0.0349)
VPOS	-	-0.008558 (0.4212)	-0.324199(0.5749)	37.209649**(0.0357)
C	-	-0.059218(0.6397)	-4.657957 (0.5143)	-56.456454 (0.6898)
		Vital Statistics		
	0.768569	0.731071	0.734059	0.820106
F-stat	4.528565 [0.004021]	1.732247 [0.002768]	7.886365 [0.000126]	5.318625 [0.002063]
Ramsey RESET linearity test	0.779627 [0.4486]	0.638471 [0.5304]	0.495291 [0.6261]	5.452661 [0.1001]
Jarque-Bera normality test	1.093825 [0.2064]	1.465752 [0.3765]	0.392075 [0.821981]	0.601545 [0.740246]
Breusch-Godfrey serial correlation LM test	1.785823 [0.2064]	1.028885 [0.3765]	0.780368 [0.4731]	0.984718 [0.4018]
Breusch-Pagan-Godfrey Heteroscedasticity test	0.371785 [0.9482]	0.388669 [0.8780]	0.767535 [0.6207]	0.721246 [0.7115]

Note: ***, **, and * indicate the statistical significance of coefficients at 1%, 5%, and 10%, respectively; the values in parentheses and block brackets are probabilities; RESET implies the Regression Error Specification Test.

Source: Author's Computation

Considering the market-based performance indicators in Table 5, it is evident that only the ATM values and online payment transactions significantly affect earnings per share in the short run. In the long run, the value of mobile transfers and online payment transactions also have a significant impact on earnings per share. Specifically, the impact coefficient for ATM is 4.287026, indicating a positive relationship between ATM transactions and earnings per share, which is significant at the 5 percent level of significance. This implies that a 1 percent increase in the value of ATM transactions results in an

average increase in earnings per share by N4.287k in the short run. Moreover, the impact coefficient for the value of online payment transactions is 0.761057, signifying a positive relationship between the value of online payments and earnings per share in the short run, which is also significant at the 5 percent level. This suggests that a 1 percent increase in the value of online payments leads to an average increase in earnings per share by N0.7610k in the short run. By contrast, in the long run, the impact coefficient for the value of mobile transfers is -0.050435, indicating a negative and significant relationship between mobile transfers and earnings per share. Consequently, earnings per share are expected to decrease by 0.0504 percent with a 1 percent increase in the value of mobile transfers. Furthermore, there is a positive relationship between the value of online payment transactions and earnings per share in the long run which is significant at the 5 percent level. This implies that a 1 percent increase in the value of online payment transactions increases earnings per share by N0.6725k on average.

The results in Table 5 also reveal that the values of mobile transfers (MOB), online payments (OPT), and point-of-sale transactions (POS) significantly influence the price-earnings ratio in the short run. Mobile transfers (MOB) and online payments (OPT) have a positive impact, while point-of-sale transactions (POS) have a negative impact at the 5 percent level of significance. Specifically, the impact coefficient for the influence of mobile transfers (MOB) is 1.521457. Because the p-value was less than 0.05, it was significant at the 5 percent level. This result indicates that a 1 percent increase in the value of mobile transfers in the short run generates an increase in the price-earnings ratio by an average of 1.52. On the other hand, the impact coefficient for the value of online payments (OPT) is 8.360601, implying that, in the short run, the price-earnings ratio is expected to rise by a multiple of 8.36, due to an increase in the value of online payments, holding other factors constant. However, an increase in the value of point-of-sale transactions (POS) in the short run reduces the price-earnings ratio by a multiple of 3.37, which is significant at the 5 percent level of significance. Similarly, in the long run, only the values of mobile transfers (MOB), online payments (OPT), and point-of-sale transactions (POS) significantly influence the price-earnings ratio. In this case, the value of mobile transfers (MOB) and online payments (OPT) negatively influences the price-earnings ratio, whereas the value of point-of-sale transactions (POS) positively influences the price-earnings ratio. Consequently, an increase in the value of mobile transfers (MOB) and online payments (OPT) by 1 percent is expected to reduce the price-earnings ratio by multiples of 31.22 and 27.04, respectively, significant at the 5 percent level. Meanwhile, a 1 percent increase in the value of point-of-sale transactions (POS) leads to an increase in the price-earnings ratio by multiples of 37.21 on average, holding other factors constant.

Examining the traditional-based performance measures in terms of return on assets and return on equity in access banks, both in the short and long run, shows that fintech has a more pronounced impact in the short run than in the long run. For Model 1, as noted above, only short-run estimates are presented because of the absence of a long-run equilibrium relationship. The results, as presented in Table 5, indicate that only the values of ATM transactions, online payment transactions (OPT), and point-of-sale transactions (POS) significantly affect the return on equity in the Access Bank in the short run. Specifically, there is a negative and significant relationship between ATM transaction value and return on equity. The impact coefficient is -0.226696, significant at the 10 percent level. This implies that a 1 percent increase in the value of ATM transactions decreases the return on equity of access banks by 0.227 percent in the short run, on average, holding other factors constant. Conversely, the value of OPT exhibits a positive relationship with the return on equity in the short run. The impact coefficient is 0.053172, which is significant at the 10 percent level. This indicates that a 1 percent increase in the value of OPT transactions increases the return on equity in the short run by 0.0532 percent, on average. Furthermore, the impact of the value of POS transactions on ROE in the short run is -0.158484, significant at the 1 percent level of significance. This suggests that a 1 percent increase in the value of POS transactions in the short run decreases return on equity by 0.1585 percent.

Similarly, in the long run, payment mechanisms have no significant influence on ROA at the 10 percent level of significance. However, in the short run, only the value of ATM transactions recorded a positive and significant impact on the return on assets of Access Bank at the 5 percent level of significance. The

impact coefficient is 0.045316, implying that the return on assets is expected to increase by 0.0453 percent because of a 1 percent increase in the value of ATM transactions, on average. All the other independent variables show an insignificant impact on ROA.

4.4.2 Regression Result for the GUARANTY TRUST BANK

Table 6 presents the regression estimates of the models for the Guaranty Trust Bank. The results comprise the short- and long-run ARDL estimates, vital statistics such as R^2 and F-statistic, and post-estimation tests including normality, serial correlation, and heteroscedasticity tests. For Model 2, because there is no long-run co-integration, only the short-run empirical result is reported for this model.

Table 6. ARDL Estimates for GTBank

Short-run estimates				
Dependent variable	$\Delta\boldsymbol{eps}$_gtbank$_t$	$\Delta\boldsymbol{roa}$_gtbank$_t$	$\Delta\boldsymbol{roe}$_gtbank$_t$	$\Delta\boldsymbol{per}$_gtbank$_t$
D ((-1))	0.365231(0.1093)	0.236206(0.5016)	-0.282088 (0.1620)	-
D ((-2))	-	-	-	-
D ((-3))	-	-	-	-
D(VATM)	4.088362**(0.0528)	0.103869*(0.6775)	-0.050470 (0.8963)	-31.853038 (0.2127)
D (VATM (-1))	-	0.242321(0.1758)	-	-
D (VATM (-2))	-	-0.085073(0.6556)	-	-
D (VATM (-3))		0.441863*(0.0517)		
D (VATM (-4))		-0.391435*(0.0651)		
D(VMOB)	-3.715149 (0.1372)	-0.016181 (0.8038)	-0.134373*(0.0883)	-8.110147 (0.3422)
D (VMOB (-1))	-	0.077116(0.3589)	-	-27.720002**(0.0132)
D (VMOB (-2))	-	-0.122224(0.2724)	-	-
D (VMOB (-3))		-0.114522(0.8440)	-	
D (VMOB (-4))		0.106909(0.1462)	-	
D(VOPT)	1.694063 (0.5539)	0.024033 (0.6885)	0.192500*(0.0650)	-7.579022 (0.2367)
D (VOPT (-1))	-	0.059900 (0.2737)		17.071300*(0.0941)
D (VOPT (-2))	-	-0.045185 (0.6016)	-	-
D (VOPT (-3))		0.276719**(0.0157)		
D (VOPT (-4))		-0.118166 (0.2779)		
D(VPOS)	6.190479***(0.0008)	-0.168986 (0.2886)	0.631839***(0.0051)	-33.865200 (0.1846)
D (VPOS (-1))	-	-	-	-30.379028**(0.0446)
D (VPOS (-2))	-	-	-	-
CointEq(-1)	-0.429491***(0.0001)	-	-0.716881***(0.0000)	-0.856370***(0.0000)
C	-26.63329***(0.7007)	-1.623294 (0.4118)	3.303497 (0.1450)	60.26095 (0.7215)
Long-run estimates				
Dependent variable	$\boldsymbol{eps}$_gtbank$_t$	$\boldsymbol{roa}$_gtbank$_t$	$\boldsymbol{roe}$_gtbank$_t$	$\boldsymbol{per}$_gtbank$_t$
VATM	2.860012***(0.0501)	-	-0.386952 (0.1457)	-1.943943 (0.9483)

VMOB	-2.598932 (0.1165)	-	-0.183830***(0.0012)	-15.373366 (0.1892)
VOPT	-2.219589***(0.3615)	-	0.002145 (0.9762)	-20.700471 (0.1196)
VPOS	4.330548**(0.3177)	-	0.368015***(0.0114)	24.207689*(0.1859)
C	-18.631310***(0.6965)	-	1.924126 (0.1695)	57.045318 (0.7164)
		Vital Statistics		
	0.700625	0.798104	0.776694	0.762251
F-stat	1.814243 [0.042773]	1.627729 [0.003114]	16.35166 [0.000002]	3.740470 [0.010717]
Ramsey RESET linearity test	0.954475 [0.4047]	4.808533 [0.1030]	1.161807 [0.2265]	1.161807 [0.2265]
Jarque-Bera normality test	125.9383 [0.000000]	0.592181 [0.774069]	46.396760 [0.000000]	0.901026 [0.637301]
Breusch-Godfrey serial correlation LM test	0.735041 [0.6454]	0.392456 [0.6945]	0.172557 [0.8433]	0.905339 [0.4303]
Breusch-Pagan-Godfrey Heteroscedasticity test	0.735041 [0.6454]	0.392456 [0.6945]	0.314001 [0.9593]	0.402421 [0.9391]

Note: ***, **, and * indicate the statistical significance of coefficients at 1%, 5%, and 10%, respectively; the values in parentheses and block brackets are probabilities; RESET implies the Regression Error Specification Test.
Source: Author's Computation

Examining the market-based performance indicators for GTBank in terms of earnings per share and price-earnings ratio, Table 6 reveals that only the values of ATM transactions and POS transactions significantly influence earnings per share in the short run at the 5 percent level of significance. The value of ATM transactions has a positive and significant relationship with earnings per share in the short run. The impact coefficient is 4.088362, significant at the 5 percent level of significance, indicating that a 1 percent increase in the value of ATM transactions generates an increase in earnings per share by N4.088k on average. Conversely, the value of POS transactions recorded an impact coefficient of 6.190479, significant at the 1 percent level, suggesting that the value of POS transactions generates an increase in earnings per share by N6.1904k in the short run on average, holding other factors constant. In the long run, only the value of ATM transactions significantly influences earnings per share at the 5 percent level of significance, with an impact coefficient of 2.860012, indicating that an increase in the value of ATM transactions generates an increase in earnings per share by N2.86k, on average, holding other variables constant. Other financial technology payment mechanisms do not significantly affect earnings per share in the long-run.

Regarding the market-based performance indicator in terms of the price-earnings ratio, the results show that none of the payment channels significantly affect the price-earnings ratio of the bank on average in the long run. However, in the short run, all payment technologies impact the price-earnings ratio, except the value of ATM transactions at the 10 percent level of significance. The value of MOB transfer shows a negative impact on the price-earnings ratio, with a 1 percent increase in VMOB decreasing the price-earnings ratio by a multiple of 27.72, on average, significant at the 5 percent level. Similarly, the value of POS transactions exerts a negative effect on the price-earnings ratio by a multiple of 30.38. On the other hand, the value of OPT transactions exerts a positive impact on earnings per share on average. A 1 percent increase in the value of online payment transfers increases the price-earning ratio by multiples of 17.07 on average, holding other variables constant.

Moving on to the traditional performance measures in terms of return on equity and return on assets presented in Table 6, for return on asset, since there is no cointegration, only the short-run estimate is provided. The Wald test of joint significance, which examines the joint significance of the series under consideration, indicates that the ATM, MOB, and OPT values are not significant at the 10 percent level of significance. Moreover, the value of POS does not significantly impact the return on assets in the short run at the 10 percent level. Considering return on equity, Table 6 shows that only the value of MOB, value of OPT, and value of POS have a significant impact on return on equity in the short run, holding other variables constant. The value of MOB recorded an impact coefficient of -0.134373, indicating a negative impact on ROE in the short run. Therefore, a 1 percent increase in the value of MOB reduces return on equity by an average of 0.13 %. On the other hand, the value of online payments has a positive impact on the return on equity. With an impact coefficient of 0.192500, a 1 percent increase in the value of online payment increases return on equity by approximately 0.193 percent on average, significant at the 10 percent level. Similarly, the value of POS has a positive and significant impact on ROE, with a coefficient of impact of 0.631839. This indicates that a 1 percent increase in the value of POS generates an increase in return on equity by 0.632 percent on average, significant at the 1 percent level of significance. Furthermore, in the long run, only the POS and MOB values exert a significant influence on return on equity. The coefficient for the value of MOB is -0.183830, whereas that of the value of POS is 0.368015. This implies negative and positive impacts, respectively. A 1 percent increase in the value of MOB and POS reduces return on equity by 0.184 percent and increases return on equity by 0.368 percent, respectively, on average, significant at the 10 percent level.

4.5. Discussion of the Findings

The results presented in this study demonstrate that fintech, represented by payment financial technologies, exerts a significant impact on the performance of the selected banks, both in the short and long run, within the period under consideration. By employing market-related performance measures, such as earnings per share and price-earnings ratio, as well as traditional performance measures, such as return on assets and return on equity, we can draw clear conclusions regarding the beneficial influence of fintech in the banking sector.

The evidence indicates that the value of ATM transactions has a positive impact on the earnings per share of GTBank in both the short and long run, while the value of POS transactions exerts a positive impact only in the short run. Additionally, the findings reveal that the value of MOB and POS transactions has a negative effect on the price–earnings ratio in the short run, whereas the value of OPT transactions shows a positive impact in the short run. Notably, all financial technologies have an insignificant effect on the price-earnings ratio in the long run.

Furthermore, the results indicate that there is no long-run equilibrium relationship between financial technology and return on assets. Consequently, this study does not report the long-term impact on ROA. However, the findings suggest that financial technology has no significant impact on ROA in the short run. Moreover, the values of OPT and OPS show a positive relationship with return on equity in the short run, whereas the value of MOB has a negative impact. In the long run, the value of MOB has a negative impact, whereas the value of POS has a positive impact on ROE. These results suggest that for GTBank, the positive effects of financial technologies outweigh the negative effects.

Similarly, the evidence indicates that the value of OPT has a positive impact on earnings per share in both the short and long run, whereas the value of ATM exerts a positive effect only in the short run for the Access Bank. Conversely, the value of mobile transfer transactions negatively impacts earnings per share. This finding suggests that payment financial technologies significantly affect the value of shareholders' earnings per unit of shares held. Similarly, the OPT and MOB values show significant positive impacts on the price-earnings ratio in the short run, while the POS value has a negative impact on the price-earnings ratio in the short run. In the long run, however, the values of MOB and OPT negatively impact the price-earnings ratio, whereas the value of POS exerts a positive influence on the price-earnings ratio. These results indicate that fintech also has a significant effect on banks' market value.

In terms of the impact of financial technologies on management capability, this study finds that they only affect the return on equity in the short run. Specifically, the values of OPT and POS transactions have a positive influence, whereas the value of ATM transactions has a negative effect. Meanwhile, regarding return on assets, only the value of ATM transactions has a positive impact in the short run, while other payment financial technologies have an insignificant effect, both in the short and long run.

In summary, this study reveals that fintech has a predominantly positive impact on banking services overall. However, GTbanks should leverage the benefits of mobile transfer payment systems (MOB) and point-of-sale (POS) by creating awareness of digital card usage and smartphone transfers while enhancing cybersecurity measures. Similarly, the Access Bank should harness its mobile transfer payment system (MOB), online payment (OPT), and point-of-sale (POS) transactions to boost investor confidence and reduce the risk of poor external evaluations. Furthermore, in the long run, Access Bank should maintain a consistently higher return on assets, particularly those related to the use of bank cards. The findings of this study align with those of previous research conducted by scholars, such as Kim et al. (2015), Truong (2016), Saksonova and Kuzmina-Merlino (2017), Leong et al. (2017), Kolesova and Girzheva (2018); Pejkovska (2018) which concur that fintech can have both positive and negative impacts on the financial sector.

5. Conclusion

5.1 Concluding Inferences

This study confirms that fintech has a positive impact on both the traditional and market-based performance measures of Nigerian banks. Therefore, fintech adoption can lead to increased efficiency, reduced costs, improved customer experiences, and enhanced financial inclusion. However, there are potential challenges associated with fintech adoption, such as cybersecurity risks and regulatory compliance issues, which could limit the overall positive impact in some cases. The study also suggests that fintech is rapidly evolving in Nigeria, driven by factors such as behavioral changes, regulation, and advancements in information technology. Thus, it makes economic sense for Banks in Nigeria to embrace fintech innovation while addressing the associated risks and challenges.

5.2 Limitations of the Study

Several constraints were encountered in this study, which may have influenced the results. First, data unavailability poses a significant challenge. The quarterly financial statements of certain banks are not easily accessible, resulting in a limited number of banks suitable for inclusion in the study. Second, the data pertaining to payment financial technologies were only available from 2012 onwards, albeit on a monthly basis. Consequently, the timeframe of the study was constrained to the period from 2012Q1 to 2019Q1.

5.3 Suggestions for further Studies

To overcome these constraints, future studies should employ a panel analysis approach to expand the scope of analysis beyond individual banks. Additionally, exploring alternative proxies for financial technology and investigating the impact of financial technologies on non-banking financial institutions can further enhance this study.

References

Adepetun, A. (2017). FinTech to distrupt retail banking by 92% in Nigeria. Retrieved from https://guardian.ng/business-services/fintech-to-distrupt-retail-banking-by-92-in-nigeria/

Anoke, A. F., Okafor, N. J., & Onu, A. N. (2023). Strategic outsourcing and corporate performance of quoted insurance firms in Nigeria. *International Journal of Financial, Accounting, and Management*, 5(1), 19-33.

Atoyebi, O. M. (2022). Overview of the Nigerian Fintech Market. Retrieved from https://omaplex.com.ng/overview-of-the-nigerian-fintech-market/

Bates, R. (2017). Banking on the future: an exploration of fintech and the consumer interest. *A Report for Consumers International*.

Begenau, J., Farboodi, M., & Veldkamp, L. (2018). Big data in finance and the growth of large firms. *Journal of Monetary Economics*, 97, 71-87.
Bijker, W. E. (2008). Technology, social construction of. *The international encyclopedia of communication*.
Boot, A., Hoffmann, P., Laeven, L., & Ratnovski, L. (2021). Fintech: what's old, what's new? *Journal of Financial Stability*, 53, 100836.
Bray, S. (2014). Power in Transit: Examining the Social Construction of Power in Relation to the Perceptions, Interactions, and Spatial Behavior of Passengers on Public Buses.
CBN. (n.d.). Financial Inclusion. Retrieved from https://www.cbn.gov.ng/fininc/
Cheng, M., & Qu, Y. (2020). Does bank FinTech reduce credit risk? Evidence from China. *Pacific-Basin Finance Journal*, 63, 101398.
Chinyamunjiko, N., Makudza, F., & Mandongwe, L. (2022). The nexus between blockchain distributed ledger technology and financial crimes. *International Journal of Financial, Accounting, and Management*, 4(1), 17-30.
Gibson, J. (2015). *The impact FinTech is having on the financial services industry in Ireland.* Dublin Business School.
Guo, P., & Zhang, C. (2023). The impact of bank FinTech on liquidity creation: Evidence from China. *Research in International Business and Finance*, 64, 101858.
Ironsi, T. (2023). 2022 in African fintech: Exploring the biggest African fintech stories that shaped the year. Retrieved from https://paystack.com/blog/operations/african-fintech-review-2022
Itah, A. J., & Emmanuel, E. E. (2014). Impact of cashless banking on banks' profitability (Evidence from Nigeria). *Asian Journal of Finance & Accounting*, 6(2), 362-376.
Kerényi, Á., & Molnár, J. (2017). The impact of the fintech phenomenon–radical change occurs in the financial sector? *Financial and Economic Review*, 16(3), 32-50.
Kim, Y., Park, Y.-J., Choi, J., & Yeon, J. (2015). An empirical study on the adoption of "Fintech" service: Focused on mobile payment services. *Advanced Science and Technology Letters*, 114(26), 136-140.
Klein, H. K., & Kleinman, D. L. (2002). The social construction of technology: Structural considerations. *Science, Technology, & Human Values*, 27(1), 28-52.
Kolesova, I., & Girzheva, Y. (2018). Impact of financial technologies on the banking sector. *KnE Social Sciences*, 215-220.
KPMG. (2017). The Pulse of Fintech Q4 2016. Retrieved from https://assets.kpmg.com/content/dam/kpmg/xx/pdf/2017/02/pulse-of-fintech-q4-2016.pdf
Lee, I., & Shin, Y. J. (2018). Fintech: Ecosystem, business models, investment decisions, and challenges. *Business horizons*, 61(1), 35-46.
Leong, C., Tan, B., Xiao, X., Tan, F. T. C., & Sun, Y. (2017). Nurturing a FinTech ecosystem: The case of a youth microloan startup in China. *International Journal of Information Management*, 37(2), 92-97.
Mlanga, S. (2019). Implications of Financial Technology for Professionals in Financial Services in Nigeria. *International Research Journal of Finance and Economics, ISSN*, 1450, 2887.
Mustapha, S. A. (2018). E-Payment technology effect on bank performance in emerging economies–evidence from Nigeria. *Journal of Open Innovation: Technology, Market, and Complexity*, 4(4), 43.
Olayinka, A. A. (2022). Financial statement analysis as a tool for investment decisions and assessment of companies' performance. *International Journal of Financial, Accounting, and Management*, 4(1), 49-66.
Otonne, A., Melikam, W., & Ige, O. T. (2023). Adoption of Financial Technology and performance of Deposit Money Banks in Nigeria.
Ovia, J. (2001). *Internet Banking: practices and potentials in Nigeria.* Paper presented at the A paper at the conference organized by the Institute of Chartered Accountants of Nigeria (ICAN), Lagos, September.
Pejkovska, M. (2018). Potential negative effects of Fintech on the financial services sector. Examples from the European Union, India and the United States of America.

Petty, R. E., & Cacioppo, J. T. (1986). *Communication and persuasion: Central and peripheral routes to attitude change*: Springer Science & Business Media.
Pinch, T. J., & Bijker, W. E. (1984). The social construction of facts and artefacts: Or how the sociology of science and the sociology of technology might benefit each other. *Social studies of science*, 14(3), 399-441.
Popoola, M., Ebiseni, I., Asuk, N., Dosunmu, A., Borokinni, A., Agunbiade, A., & Fubara, N. (2023). Nigeria: Fintech Review 2022 – Recent Regulatory And Legal Developments In Nigeria.
Rahmawati, Y., & Hadian, H. N. (2022). The influence of debt equity ratio (DER), earning per share (EPS), and price earning ratio (PER) on stock price. *International Journal of Financial, Accounting, and Management*, 3(4), 289-300.
Saksonova, S., & Kuzmina-Merlino, I. (2017). Fintech as financial innovation–The possibilities and problems of implementation.
Tharu, N. K., & Shrestha, Y. M. (2019). The influence of bank size on profitability: an application of statistics. *International Journal of Financial, Accounting, and Management*, 1(2), 81-89.
Tosin, I. O., & Otonne, A. (2019). A comparative analysis of the determinants of profitability of commercial and microfinance banks in Nigeria. *International Journal of Financial, Accounting, and Management*, 1(3), 173-182.
Truong, T. (2016). How FinTech industry is changing the world.
Tushman, M. L., & Anderson, P. (1986). Technological Discontinuities and Organizational Environments. *Administrative science quarterly*, 31(3), 439-465.
Zhao, Y., Goodell, J. W., Wang, Y., & Abedin, M. Z. (2023). Fintech, macroprudential policies and bank risk: Evidence from China. *International Review of Financial Analysis*, 87, 102648.