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EFFECT OF FINANCIAL TECHNOLOGY ON PERFORMANCE OF LISTED BANKS IN NIGERIA

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Abstract: The sweeping revolution in the financial technology space has significantly altered the hitherto traditional financial architecture, bringing in new diversified products and services, with efficient and innovative financial service delivery Against this premise, this study empirically investigates the effect of financial technology (i.e. fintech) on performance of listed banks in Nigeria for the period 2014-2024. Data for the ten biggest banks by total asset size in the Nigerian banking industry were utilized. Four major variables that capture innovations in fintech as the explanatory variables, internet banking, ATM, mobile banking, as welll as POS, were used, and Return on asset (ROA) is used to capture the dependent variable. The panel least squares estimation technique was utilized in the analysis. The findings indicate that financial technology has a positive and significant impact on bank performance in Nigeria. Specifically, internet banking services, mobile banking and ATM have positive and significant impact on ROA of banks in Nigeria. The evidence further show that POS service is positively related to ROA but not significant. Based on the findings, it is suggested that increased digital technology be employed in financial services in order to enhance bank financial performance in Nigeria.

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1. INTRODUCTION

In today's digital age, banks in Nigeria must adapt to the rapidly changing financial landscape, driven by financial technology and innovation. The global financial structure has undergone significant transformations due to regulatory changes and advancements in information technology, intensifying competition in the banking industry (Smith, 2020; Ozekhome, 2023). Financial innovation enhances the efficiency of performance of financial system systems by modifying the role of financial intermediaries. Financial technology (Fintech), a key driver of this innovation, has enabled targeted applications, such as digital payments, wealth management, lending and investment services (Karsh & Abufara, 2020).

By expanding financial markets, and introducing new products, fintech has increased financial inclusion and transformed the banking industry's operations. Moreover, fintech has boosted the popularity of deposit money banks' products and services, fostering greater competition and driving the delivery of quality customer-oriented services (Thakor 2020). In response to changes in the financial system, penetration of financial technology has forced banks to adjust their business thinking, accelerate technological updates, improve efficiency, and earn greater performance (Li, Stasinakis and Yeo, 2021).

Statement of Problem

The new financial technology era in the banking sector ushers in a battery of new challenges, opportunities, and risks. Financial technology has transformed the banking sector, spawning a new generation of digital technology platforms around that deliver cutting –edge services and products worldwide (Gomber, et al, 2017; Ozekhome, 2023). With the spate of the financial technology revolution, no financial service provider, particularly banks can survive. Different approaches have been employed in the literature to investigate the impact of financial technology on the financial landscape (Yohani & Dita, 2019; Zinakova, 2020; Li et al, 2021).

The Nigerian banking sector has witnessed significant transformations with the advent of financial technology (fintech). Despite this, Nigerian banks

still face challenges in leveraging fintech optimally to enhance performance. While some banks have invested heavily in digital platforms, others lag behind, and the sector's overall performance remains mixed. The adoption of fintech has raised concerns about cybersecurity, infrastructure and regulatory compliance.

Financial technology drives financial development, and thus financial performance. Financial technology and financial development in Nigeria are significantly underdeveloped compared to other financially-developed countries. Consequently, banks have achieved varying degrees of success in utilizing digital investments to generate profit. The existing studies (for instance, Amadou, 2019); Youbem, 2021; Lasak, 2022) failed to clearly articulate the profitability of specific fintech channels in the banking context. Given the inconclusive evidence regarding this, particularly in the Nigerian banking contexts, this study becomes imperative.

Objectives of the Study

The objective of this study includes

- examine the relationship between fintech and bank performance in Nigeria.
- Investigate the extent to which the disaggregate channels of fintech influence bank performance in Nigeria.

2. LITERATURE REVIEW

2.1. Conceptual Issues

Financial technology is a digital technology service/platform that supports the delivery of banking and financial services (Youbem, 2021). Financial technology services include facilities for conducting bank transactions, such as internet banking, Automated Teller Machine (ATM) transactions, mobile banking, Point of Sales (PoS) transactions and other digital payment services that simplifies banking system/operations. Such enhanced digital financial services are basically tailored to meet the growing needs of customers.

2.1.1 Channels of Innovations in Fintech

2.1.2. Internet banking

This is the provision of banking services via internet-enabled systems, with the resultant improved access to banking services. It is also known as online

banking. Thus, internet banking refers to the conduct of banking transactions using mobile devices such as cell phones or personal digital assistants (s). As suggested by Hamilton et al. (2007), Digital banking platforms provide anytime, anywhere access to services like transactions, account management, and financial information, reducing the need for physical bank visits.

Clients gain greater control as they can assess their accounts with minimal delays, as well as, enabling informed financial management. Banks are increasingly operating websites and transaction portals where customers can not only inquire about account balances, interest rates, and exchange rates, but also conduct a variety of transactions. The rise of internet banking has opened up new avenues as a wider population can now access financial services more easily and quickly, regardless of location The advancement of information technology has increased its adoption among deposit money banks and microfinance institutions (Keliuotyte & Smolskyte, 2019).

2.1.3. Automated Teller Machine (ATM)

The ATM is a simple non-branch banking system that allows bank customers to check their balances, withdraw money and carry out digital payments, using their cards and secret pins.

Empirical evidence has shown that the use of ATMs has improved the delivery of deposit money banking services. Without doubt, interconnecting ATMs among deposit money banks has increased their penetration, with greater degree of (Adeniran & Junaidu, 2014).

2.1.4. Mobile Phone Banking

Mobile banking is a digital configuration that allows financial institution and customers conduct various financial transactions using a mobile device such as a phone or tablet. Tiwari, Buse and Herstatt (2006) see mobile banking as a digital finacial transaction that involves the transference of the owner's rights to use goods and services, accomplished by using mobile to computer-mediated networks with the assistance of an electronic device. It is the practice of providing bank-related financial services using mobile telecommunication devices. Mobile banking is usually done through SMS or mobile internet, but it can also be done through specific programs known as 'clients' that are downloaded to the mobile device. Since the bank the customer performs

operations on his phone, the mobile phone appears to be the most effective means of e-banking. Customer satisfaction and greater banking efficiency has increased as a result of the use of alternative financial service providers.

2.1.5. Point-of-Sale (POS)

The point of sale (POS), likewise known as the point of purchase (POP) or checkout, refers to the spot or location where transactions are completed, typically using a card. And electronic payment terminal The selling process is managed by a POS terminal via a salesperson-accessible interface (Mago & Chitokwindo, 2014). The receipt can be created and printed using the same system.

2.2. Theoretical Literature

2.2.1. Innovation Diffusion Theory

Rogers (1962) proposed the theory of innovation diffusion. The theory published in his seminal book, *Diffusion of Innovations*, identified four key components of innovation: the innovation itself, the communication channels used, the time over which it spreads, and the social system it spreads through. He outlined five categories of adopters, innovators, early adopters, eerily majority, and laggards- and the stages of the adoption process, from awareness to confirmation. According to theory, any institution seeking to grow should be disposed to experiment. The theory identifies five crucial features of innovations: improvement of current modes of operation, consistent approach to performance, pre-testing capacity, and ease of observing any shortcomings. Institutions can gain a competitive advantage and reduce operational costs through innovation. Furthermore, institutions would be able to penetrate new markets and find new ways to serve their customers.

In line with the tenets of the theory, the process of disseminating an innovation is communicated through communication channels between members of a social system. The adoption of an innovation involves a process of\ learning, opinion-creation, decision –making, implementation and ongoing evaluation.

2.2.2. Technology Acceptance Model (TAM)

The theory is associated with Davis (1989), who proposes that people must have an acceptable new technology and innovative mind to adopt new product

and services. The TAM model sought to relate the behavioural intention of peoples when using digital service. The theory asserts that there are two factors that determine whether a computer system (technology in this context) will be accepted by its potential users, perceived usefulness, as well as perceived ease of use. Accordingly, behavioral intention influences a person's actual behavior to accept and use innovative digital service and this is greatly influenced by the user's life perception toward the value of the innovation. The value and simplicity of the technology is a determining factor for the level of perception. Accordingly, innovations in finance brought about by digital technology adoption is critical to banking performance, since it is highly useful to efficient and quality service delivery and has a higher degree of ease of use.

2.3. Empirical Literature

Bagud, Khan and Abdul-Hakim (2017), utilizing descriptive statistics, finds a positive impact of mobile banking on bank financial performance in Nigeria. Kamil (2018) used multiple regression technique to examine the nexus between financial technology and bank performance in Nigeria. The findings show a positive impact on loan to deposit ratio (LDR) and good corporate governance (GCG).

Abdullai (2018), based on evidence from Kenya banks and panel data methodology, finds that internet banking has a positive and significant impact on bank efficiency but a negative impact on return on assets (ROA), non-performing loans (NPL), and capital adequacy ratio (CAR), which are measures of bank financial performance. The reason for insignificant impact of internet banking could be due to differences in control variables, proxies used and /or country contexts.

Medyawati, Yunanto and Hegarini (2021) examine the relationship between financial technology and financial performance of listed banks on the Indonesian Stock Exchange (IDX). Over the period 2014-2020. Automated Teller Machine (ATM) transactions volume and online transactions frequency were used to capture financial technology, while profitability was measured by return on assets (ROA). Utilizing panel data regression technique, the results show that internet and mobile banking significantly influences bank financial performance. The impact of ATM was found to be insignificant. The divergence of their results is, perhap, due to the use of different variables, and proxies used.

Based on the findings, the authors recommend the strengthening of digital banking in order to continue to enhance bank profitability. Other studies that found positive impact of fin tech on banking performance are Adeniran and Junaidu (2014); Mago, and Chitokwindo (2014). Amadou (2019); Keliuotyte and Smolskyte (2019); Karsh and Abufara (2020); Thakor, (2020); Youbem (2021); Li et al. (2021), and Lasak (2022).

Fintech's impact on financial performance is insignificant according to some studies. For instance, Sinambela and Rohani (2017) find that internet banking does not significant impact financial performance metrics like return on assets (ROA) and return on equity (ROE); Firdaus (2019) and Rusdiono (2019) find evidence that fin-tech has no substantial impact on financial performance of banks. The study by Yohani and Dita (2019), which examined the nexus between financial technology and bank financial performance for the period 2015-2018, using panel least squares methodology show that financial technology has no significant effect on financial performance. Zinakova (2020) investigated fin-tech, its functional mechanisms and impacts on bank financial performance, using evidence from Nordic countries. The results of the panel least square reveals that fintech significantly influences market performance, and has a negative impact on profitability, liquidity, and solvency of banks.

Overall, the existing literature on the impact of financial technology on banking performance presents mixed findings, with some studies reporting positive effect, while others find insignificant or negative effects. The divergence in results may be attributed to differences in control variables arising from variations in the set of control used, such as bank-specific characteristics, e,g bank size macroeconomic factors, or regulatory environments; methodological approaches due to differences in analytical design, data used, sample periods, or econometric techniques employed, and country contexts, attributable to differences in economic, regulatory, and technological environments, as well as financial infrastructure or digital literacy across different countries or regions.

2.4. Gap(s) in Literature

Based on the empirical review of the extant literature, there is noticeable gap on the link between innovations in fintech (fintech) and bank financial performance in Nigeria. Besides, the existing studies failed to clearly articulate

the profitability of specific fintech channels in the Nigerian banking context, necessitating this study.

3. METHODOLOGY

3.1. Theoretical Framework

The Innovation Diffusion Theory (IDT) serves as the theoretical basis of this study Its choice is based on its ability to effectively capture innovations in financial technology that have expanded the range of financial services, ensuring efficiency and improved customer-oriented financial service delivery through digital technology (i.e. fintech).

3.2. Model Specification

Following the review of the theoretical literature, the model capturing the effect of financial technology on performance of listed banks in Nigeria is specified as:

$$FP_{it} = f(IB_{it}, ATM_{it}, MB_{it}, POSS_{it}) \quad (1)$$

FP_{it} is denotes performance of banks, the dependent variable; IB is internet banking service, ATM denotes Automated Teller Machine service, MB represents mobile banking and POS denotes Point of Sale terminal service, which are the components of innovations in fintech.; *t*, is time *F*

The empirical specification of the model is:

$$FP_{it} = \alpha_0 + \alpha_1 IB_{it} + \alpha_2 ATM_{it} + \alpha_3 MB_{it} + \alpha_4 POS_{it} + \alpha i + \lambda t + \varepsilon_{it} \quad (2)$$

Where the variables are as earlier defined,

αi is bank specific-fixed effect (capturing time-invariant bank characteristics);

λt is time – specific fixed effect (capturing common shocks or trends across all banks at time t).

$\alpha_1 - \alpha_5$ are the parameters to be estimated, and ε is the unobserved error term.

Apriori, expectation: $\alpha_1, \alpha_2, \alpha_3, \alpha_4 > 0$.

3.3. Definitions of the Variables and Measurement

The definition of variables as well as their measurement is presented in Table 1

Table 1. Variables Definition and Measurement

Variable	*Definition*	*Measurement*
Bank Performance	Bank performance is associated with increased profitability; greater resources for financial intermediation, efficient service delivery, increased bank stability and quality financial products	Return on Asset (ROA), expressed as ratio of net profit to total assets
Internet Banking	Innovative technology that allows the conduct of financial transactions via the Internet	Total value of internet transactions as ratio of total assets
Automated Teller Machines	Digital service that dispenses cash or performs other banking services when an account holder inserts a bank card.	Total value of ATM transactions as ratio of total assets
Mobile Banking	Financial transactions via mobile device (phone and tablets)	Total value of transactions carried out on mobile banking services as ratio of total assets
Point of Sales	Terminals allow customer executes the payment for goods or services and where sales taxes may become payable. Also, cash can be withdrawn, deposited and transferred.	Total value of POS transactions as ratio of total assets
		.

Source: Authors' compilation.

3.4. Data and Estimation Method

Panel data involving the 10 largest banks by total asset in Nigeria are used in the estimation. The banks include Access, First Bank Nig Ltd (FBN), Guarantee Trust Bank Limited (GTBank- GTCO), UB- United Bank for Africa, Zenith Bank Plc, ECO Bank Plc, FCMB - First City Monument Bank Plc, Sterling Bank Plc, Fidelity Bank Plc, and Union Bank Plc. The constitute the biggest in the Nigerian banking industry, accounting for over 85 percent of the total assets and deposits, including the deployment of financial technology. Specifically, five of these ten banks, Access Bank PLC, First bank Nig. Ltd, Guarantee Trust Bank (GTCO), United Bank for Africa (UBA) AND Zenith Bank Plc, accounts for 80.5% of the industry's and are considered major players, often referred to as D- Tier -1 banks, the FUGAZ (First bank, UBA, GTCO, Access bank, and Zenith bank, a condensation that denotes First Bank, UBA, GTCO,

Access and Zenith). The period of investigation is 2014-2024. The study period was chosen based on data availability, as well as characterizing the period of increased digital banking in Nigeria. The data were sourced from individual banks website, Central Bank of Nigeria's Statistical Bulletin (various issues), and the IMF. Given the nature of the study (i.e time series-cross-sectional), a panel data approach is utilized for the empirical estimation.

4. RESULTS AND DISCUSSION

4.1. Hausman Test

The results of the Hausman test to choose the best strategy is reported in Table 2.

Table 2: Summary of Hausman Test for Cross-Section Random Effects

Cross-section Random Effects Test			
Model	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Return on Asset	12.88	5	0.02

Source: Authors' estimation

The results of the Hausman test reveals a chi-stat of 12.88 [0.02], that is significant at the 1 percent level, plausibly choosing the fixed-effect model results as best to capture relationship between fintech and performance of deposit money bank in Nigeria. The results, are accordingly reported in the Table 3.

4.2. Fixed Effects Model Results of ROA

Table 3: Dependent Variable: ROA

Variables	*Coefficient*	*t-value Prob.*
C	0.072	1.11 0.21
IB	0.124	2.732 0.02
ATM	0.035	2.301 0.03
MB	0.062	2.287 0.03
POS	0.040	1.066 0.17
$R^2 = 0.772$ Adjusted $R^2 = 0.722$	F = 27.50	DW = 1.73

Source: Authors' estimation

The coefficient of determination is 77.2 percent. Adjusting for degrees of freedom yields an adjusted of 0.722. Thus, 72.2 percent of the net systematic

changes in financial performance' of banks in Nigeria (proxied by ROA) is explained by financial technological variables (i.e Internet banking, ATM, mobile banking, point of sales service platforms deployed by the bank).

The F-value of 27.5, an indication of the overall fit of the model is 1 significant. Thus, view of fintech and performance of deposit money bank, having a significant linear relationship is validated. With a Durbin Watson Statistic of 1.73, auto correlation is not a concern, enhancing the model's reliably for policy formulation and implementation purposes.

Internet banking is positive in line with theoretical expectation and is statistically significant at the 1 percent level. This is a clear indication that the introduction of internet banking has had a positive and significant effect on the performance and profitability of deposit money banks in Nigeria. In particular, it shows that increased bank and diversified bank services on account of the internet banking through technological innovation has had a stimulating effect on the performance of banks in Nigeria. The finding confirms the results of Hamilton et al. (2007), Adeniran and Junaidu (2014), Karsh and Abufara (2020), Thakor (2020) and Youbem (2021)/.

ATM is positively signed and significant at the 5 percent level. Thus, the use of ATM as an innovation in financial technology has significantly increased banks 'performance in Nigeria, particularly as regard efficient and quick service delivery. The result supports the findings of Kamil (2018) and contrasts with the findings of Keliuotyte and Smolskyte (2019).

The coefficient of mobile banking is positively signed and is statistically significant at the 5 percent level. Invariably, mobile banking technological innovation has reduced the problems of weak institutional infrastructure and the cost structure of conventional banking, the effect which has had a stimulating effect on the performance of deposit money banks in Nigeria. The finding corroborates the findings of Ughulu and Agbonkhese (2020).

The coefficient of number of pint of sale (POS) is positively signed but fails the significance test the 5 percent level. The result is contrasts with the findings of Mago and Chitokwindo 2014). This insignificance could be due to the lack of complete integration, high transaction costs, or the possibility that the revenue from POS is not captured adequately in the ROA of the listed banks themselves (if the terminals are primarily operated by non-bank agents). Overall, the three fintech variables show that financial technology innovation has a positive and significant impact of the performance of banks in Nigeria.

5. SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1. Summary and Conclusion

This study empirically investigates the impact of financial technological (fintech) on the financial performance of listed banks in Nigeria. A sample of ten (10) big banks were examined over the period 2014-2024. Using return on asset (ROA) as proxy for performance which was regressed on four core fintech variables (i.e internet banking, ATM, mobile banking and point of sales) as explanatory, the empirical results, using panel data technique revealed the following findings:

- Internet banking has a positive and significant impact on financial performance of banks, measured by return on asset (ROA) of deposit money banks in Nigeria.
- Mobile banking has a positive and significant impact on ROA of deposit money banks in Nigeria.
- Point of Sale is positively related to ROA of banks in Nigeria but not significant.

From a policy perspective, the results of this study are highly relevant, particularly given the critical need for banks to adopt new and efficient technology that guarantees enhanced and diversified banking services. As bank management devise new standards of reaching out to the customers in an effective and efficient way, through technological innovation, the capacity to increase banking services and consequently, greater financial performance in terms of asset return is enhanced.

5.2. Policy Recommendations

Based on the empirical findings from the study, the following policy recommendations are made:

- Increased used of technological and innovation financial services through access to internet banking should be encouraged by deposit money banks in Nigeria. This will not only have increased their ability to render more banking and financial services to the teeming public but enhanced their ability to make more returns.
- Increased deployment of better, workable and efficient ATM services that will enhance the financial performance of the banking industry in Nigeria.

- Increased deployment of mobile banking services should be encouraged to reach the unbanked global poor, as this will solve the weak institutional infrastructure and cost structure of conventional banking, the overall effect which will lead to greater performance for deposit money banks in Nigeria.
- Large number of point of sales should be deployed by deposit money banks in order to execute greater financial services. This will, in turn enhance their performance.

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