

**EMPIRICAL ANALYSIS OF THE IMPACT OF FINTECH INTEGRATION ON FINANCIAL INCLUSION AMONG DEPOSIT MONEY BANKS IN KANO METROPOLIS: A DYNAMIC CAPABILITY PERSPECTIVE**

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**Abstract**

The influence of FinTech integration on financial inclusion among Deposit Money Banks (DMBs) in Kano Metropolis, Nigeria, is examined in this research. The study used a quantitative research approach and collected data from 376 banking professionals in 8 DMBs using a structured questionnaire. Multiple regression and the Partial Least Squares Structural Equation Model (PLS-SEM) in SmartPLS 4 were used to analyze the data. The study's conclusions suggest that while mobile banking and digital payments have large bivariate associations with financial inclusion, they don't have any notable distinctive impacts in the integrated multivariate model. In the meanwhile, trust and cybersecurity were shown to be the most important factors influencing financial inclusion, accounting for 89.3% of the variation ( $f^2 = 0.691$ ). In the integrated model, agency banking and digital credit continued to have a major beneficial influence. The findings imply that a comprehensive, trust-based ecosystem—rather than discrete technological features—is what propels financial inclusion. In order to improve equitable financial access, the report advises banks to give cybersecurity and integrated Fintech ecosystems top priority.

**Keywords:** *Fintech Integration, Financial Inclusion, Deposit Money Banks, Dynamic Capability, Cybersecurity, Agency Banking.*

**Introduction**

Fintech, or financial technology, is a new player in the banking industry that is drastically altering how financial services are provided globally. Traditional banking institutions were transformed by the rise of Fintech technologies, which offered previously unthinkable possibilities for improving payment systems, expanding financial inclusion, and streamlining loan availability. Understanding the anticipated effects of the technologies on financial dynamics is crucial as Nigeria is a nation where Fintech application and usage are still developing. Financial inclusion, payment systems, and credit availability are essential components of both social welfare and economic progress. Access to appropriate and reasonably priced financial services for all people and enterprises is known as financial inclusion, and it has long been recognized as a key component of inclusive development and the fight against poverty. As the mechanism that facilitates the flow of money and for economic transactions to occur, payment systems make up the core layer of economic activity. Fintech is using a variety of technical advances, such as blockchain, digital wallets, and mobile banking, to eliminate conventional financial access barriers and accelerate many good advancements in financial inclusion on a global scale. However, Fintech acceptance and utilization are still in their infancy in Nigeria, with both prospects and underlying obstacles. The research now in publication has examined the growth of Fintech and its impact on credit availability, payment methods, and financial inclusion. There are clear gaps in this regard, particularly with regard to Nigeria's unique setting. There is a dearth of research that reflects the unique possibilities and issues confronting the Nigerian financial ecosystem, particularly in the context of Fintech adoption, despite the fact that current research offers solid information on worldwide trends and best practices. For a variety of reasons, this is the most important aspect that needs immediate attention. First off, Nigeria has one of Africa's largest economies and a sizable population, making it a growing market for financial services. To assist the development of sustainable economies and inclusion, it is essential to recognize the role Fintech may play in advancing financial inclusion, improving payment systems, and expanding credit availability. Additionally, this will provide policymakers, regulators, and industry stakeholders with practical policy insights to develop evidence-based intervention programs and initiatives. By conducting a thorough investigation of Fintech's impact on financial inclusion, payment systems, and credit availability in Nigeria, this study seeks to close the scientific gap. Based on the available examples and empirical data, the qualitative research approach will be used in this concept paper to thoroughly examine the theoretical aspects and practical issues related to Fintech acceptance. Additionally, an interdisciplinary approach will be used to identify the intricate relationships between technical innovation, regulatory frameworks, consumer behavior, and market dynamics due to the topic's multiple nature. In order to provide a thorough understanding of the prospects and difficulties associated with Fintech's adoption in Nigeria, this study integrates ideas from economics, finance, technology, and policy studies.

**1. Statement of the Problem**

Despite advancements in financial services, around 36.8% of Nigeria's adult population is still unbanked due to obstacles such as inadequate financial knowledge, lack of documents, and remote location. Because traditional banking institutions are expensive and inefficient, especially in rural regions, people rely more on cash transactions and unofficial financing, which limits economic development and increases security issues. Due to strict qualifying requirements and a lack of credit information, many people find it difficult to get credit, particularly SMEs and individuals without collateral. A thorough grasp of the relationships and structural obstacles causing financial exclusion is necessary to address these issues. In order to provide answers for promoting equitable economic development, this paper examines these problems via the prism of Fintech innovation.

**2. Significance of the study**

The study is noteworthy for its multifaceted contributions: academically by filling in identified empirical and conceptual gaps; theoretically by applying the Dynamic Capability Perspective to financial inclusion; practically by providing managers and FinTech providers with practical insights; policy-wise by influencing financial inclusion strategies and regulatory reforms; and contextually by improving socioeconomic outcomes in Kano Metropolis. As a result, the study offers a current, fact-based, and contextually pertinent investigation with wide-ranging consequences for practice, policy, and scholarship.

**4. Research Objectives**

1. To assess the effect of digital payment services on financial inclusion among DMBs in Kano Metropolis.
2. To examine the impact of mobile banking adoption on financial inclusion among DMBs in Kano Metropolis.
3. To determine the influence of online/digital credit facilities on financial inclusion in DMBs in Kano Metropolis.
4. To evaluate the role of agency banking in promoting financial inclusion among DMBs in Kano Metropolis.
5. To investigate how cybersecurity measures and customer trust affect financial inclusion among DMBs in Kano Metropolis.

**5. Research Questions**

1. How do digital payment services affect financial inclusion among DMBs in Kano Metropolis?
2. What is the impact of mobile banking adoption on financial inclusion among DMBs in Kano Metropolis?
3. How do online/digital credit facilities influence financial inclusion among DMBs in Kano Metropolis?
4. What is the role of agency banking in promoting financial inclusion among DMBs in Kano Metropolis?
5. How do cybersecurity measures and customer trust affect financial inclusion among DMBs in Kano Metropolis?

**6. Research Hypothesis**

- H<sub>01</sub>: Digital payment services have no significant effect on financial inclusion among DMBs in Kano Metropolis.  
H<sub>02</sub>: Mobile banking adoption has no significant effect on financial inclusion among DMBs in Kano Metropolis.  
H<sub>03</sub>: Online/digital credit facilities have no significant effect on financial inclusion among DMBs in Kano Metropolis.  
H<sub>04</sub>: Agency banking has no significant effect on financial inclusion among DMBs in Kano Metropolis.  
H<sub>05</sub>: Cybersecurity measures and customer trust have no significant effect on financial inclusion among DMBs in Kano Metropolis.

## 7. Literature Review

**7.1 Defining Fintech and Its Components:** FinTech (shortened from “Financial Technology”) is a combination of “financial” and “technology”, which stands for the application of modern technological solutions for financial services transformation and improvement. Scholars have come up with different definitions of Fintech, emphasizing its role in improving efficiency, accessibility, and inclusivity in financial systems (Suryono, Roemis, Rasti, and Siti, 2020). Fintech is an umbrella term that covers a broad spectrum of technologies and businesses such as mobile banking, peer-to-peer lending, robo-advisors, blockchain, and artificial intelligence.

**7.1.1 Framework for Analyzing Financial Inclusion:** Financial inclusion is a multiplex concept that is not just about having bank accounts but also about the availability of financial services for all the sectors of the society. Financial inclusion is assessed in a systematic manner using factors such as access to basic banking services, usage of financial services, affordability of financial services, and the effect of financial inclusion on economic empowerment and poverty reduction.

**7.1.2 Digital Payments:** Digital payments constitute one of the primary dimensions of FinTech integration, representing electronic transfers of money that replace cash transactions. This includes mobile money transfers, point-of-sale (POS) systems, online payments, and other electronic channels facilitated by banks and financial technology providers (David-West, 2016). Digital payments reduce transactional friction, enhance convenience, and provide secure alternatives to cash, particularly in areas where traditional banking infrastructure is limited. The integration of digital payments in DMBs in Nigeria can potentially address these gaps by providing seamless, safe, and inclusive financial services, which are particularly relevant in high-density commercial centers such as Kano Metropolis.

**7.1.3 Mobile Banking:** Mobile banking refers to the provision of banking services through mobile devices such as smartphones and feature phones, allowing customers to perform transactions without visiting physical bank branches. Services include funds transfer, bill payments, balance inquiries, airtime top-ups, and mobile account management (Dr. Naveen Prasadula, 2026). Mobile banking has been recognized globally as a key enabler of financial inclusion, particularly in developing countries where traditional banking infrastructure is limited (Adeola & Evans, 2017). Mobile banking facilitates inclusive growth by lowering transaction costs, enabling real-time financial management, and enhancing the efficiency of banking operations (Kandpal, 2020).

**7.1.4 Digital Credit:** Online or digital credit refers to lending services delivered through digital platforms, including mobile applications, online banking portals, and fintech-based credit services. Unlike traditional loans, digital credit leverages automated credit scoring algorithms, data analytics, and mobile technology to provide instant or rapid access to small loans (Adeola & Evans, 2017). The relevance of digital credit in promoting financial inclusion lies in its ability to serve individuals and small businesses excluded from conventional credit systems. In Nigeria, traditional banking often restricts credit access due to collateral requirements, bureaucratic processes, and risk aversion. Digital credit addresses these barriers by utilizing alternative data sources, such as mobile usage patterns and digital transaction histories, to assess creditworthiness (David-West, 2016).

**7.1.6 Agency Banking:** Agency banking involves the outsourcing of financial services to third-party agents who act on behalf of banks to provide basic banking transactions in remote or underserved locations. Services typically include cash deposits, withdrawals, account opening, bill payments, and fund transfers (David-West, 2016). In Kano Metropolis, agency banking allows DMBs to penetrate high-density commercial areas, informal markets, and peri-urban settlements. This approach complements digital channels and physical branches, creating a hybrid model that strengthens financial inclusion. However, the effectiveness of agency banking depends on regulatory support, agent reliability, and adequate training to ensure service quality (Migap et al., 2015).

**7.1.7 Cybersecurity and Trust:** Cybersecurity and customer trust represent a critical dimension of FinTech integration, emphasizing the protection of digital financial systems and fostering confidence among users. With increasing reliance on mobile banking, digital payments, and online credit platforms, the risk of cyberattacks, fraud, and data breaches rises (David-West, 2016).

Trust in financial institutions is a prerequisite for the adoption of digital services. Customers are more likely to engage with banks offering secure, reliable, and transparent digital platforms (Adeola & Evans, 2017). In Nigeria, cybersecurity challenges, including phishing, malware, and identity theft, have occasionally hindered the adoption of FinTech solutions. Therefore, DMBs must implement robust cybersecurity protocols, educate customers, and comply with regulatory frameworks to maintain trust and protect sensitive financial data (Kandpal, 2020).

**7.1.8 Relationship Between FinTech Integration (IV) and Financial Inclusion (DV):** The conceptual model suggests that various dimensions of FinTech integration have a positive impact on financial inclusion in Deposit Money Banks (DMBs) in Kano Metropolis, as defined by factors such as account ownership and credit access. Key dimensions include:

**I. Digital Payments** - Enhancing transaction efficiency and access for unbanked populations through platforms like POS and mobile money.

**II. Mobile Banking** - Allowing customers to manage finances remotely, improving engagement and financial literacy.

**III. Online/Digital Credit** - Broadening loan access via digital assessment tools, benefiting underserved demographics.

**IV. Agency Banking** - Extending services through third-party agents in remote areas, increasing account usage.

**V. Cybersecurity & Trust** - Ensuring user confidence through robust security measures, crucial for ongoing digital engagement.

The integration of these elements is expected to improve customer participation in the formal financial system, thereby addressing financial inclusion challenges in the region.

**7.2 Review of Past Empirical Studies:** The integrated model of the influencers of SMEs e-payment adoption and usage, as carried out by Igudia, P. O. (2016). The research utilized survey information collected from both urban and rural areas and discovered that electronic payment systems greatly improved banking access for the disadvantaged. The findings showed that there was a positive association between the usage of e-payment systems and financial inclusion indicators, e.g., account ownership and usage. A study done by Ashoro, C. O. et al. in the year 2024 investigated financial inclusion and its effects on agriculture in Delta State, Nigeria. The research enabled the study to determine that urban consumers have embraced digital payments such as mobile money and online banking, which have led to the reduction in the use of cash-based transactions. The findings affirmed the significance of convenience, security, and trust as major factors behind the adoption of digital payment solutions in agricultural activities. Nghargbu, R. (2024) conducted Digital Currency Adoption in Nigeria: Determiners, Opportunities, and Threats. In the digital currency assets and the threat to financial stability. The study was based on data from lending institutions and Fintech firms, and it analyzed the accuracy, efficiency, and inclusivity of credit scoring algorithms in predicting creditworthiness. It was demonstrated that the fintech-powered credit assessment models beat the conventional models in terms of accuracy and inclusivity, especially for people with no collateral or credit history.

**7.3 Research Gap:** Existing studies indicate that FinTech integration can significantly improve financial inclusion through dimensions such as digital payments, mobile banking, online credit facilities, agency banking, and cybersecurity measures (Dwivedi et al., 2021; Senyo & Osabutey, 2020). However, there is a pronounced empirical gap regarding how these dimensions interact in the Nigerian context, particularly in urban centers like Kano, where financial behaviours and technology adoption are shaped by complex socio-economic factors. A theoretical gap also exists, as few studies have applied the Dynamic Capability Perspective to explain how FinTech integration enables institutions to adapt, innovate, and reconfigure resources to improve financial inclusion outcomes (Adegbite, 2025; Azmeh & Al-Raei, 2024). Furthermore, a conceptual gap is evident, with prior research often treating FinTech as a unidimensional construct, ignoring the multifaceted nature of digital financial services

(Badrudin, 2017; Kirana & Havidz, 2020). Finally, a contextual gap persists, given the scarcity of studies examining the specific dynamics of FinTech-driven financial inclusion in Kano Metropolitan (Wayne et al., 2020; Aicha, 2023).

**7.4 Theoretical Framework**

The theoretical review forms the intellectual backbone of this study by explaining how FinTech integration shapes financial inclusion. Theories provide insights into organizational behavior, technology adoption, and customer interactions with financial services, thereby contextualizing the mechanisms through which Deposit Money Banks (DMBs) can enhance access to financial products. A robust theoretical foundation is necessary to justify the conceptualization of the study variables, inform the research design, and guide data interpretation (Teece, 2007; Barney, 1991). This review situates the study within the Dynamic Capability Theory (DCT) as the primary framework, complemented by established technology adoption and organizational theories, to explain the nuanced relationship between digital financial innovation and inclusion.

**8. Methodology of the study**

The study employed an explanatory and descriptive-causal quantitative design by following a positive paradigm, using a deductive approach to test the hypothesis. The population of the study consists of employees of 8 actively operating DMBs in Kano Metropolitan (Access Bank, First Bank, FCMB, GTBank, UBA, Zenith Bank, Fidelity Bank, and Ja'iz Bank) .A sample of 376 respondents was achieved, representing various departments including Operations, IT/Digital Banking, and Customer Service. A Structured questionnaire using a 5-point Likert scale was used for data collection. Reliability was confirmed with Cronbach’s alpha and SmartPLS 4 for PLS-SEM to test the integrated structural model.

**8.1 Model Specification**

The functional relationship between FinTech Integration and Financial Inclusion is specified as:

In its econometric form, the equation is represented as:

Where:

FI = Financial Inclusion (Dependent Variable)

DP = Digital Payments

MB = Mobile Banking

DC = Digital Credit

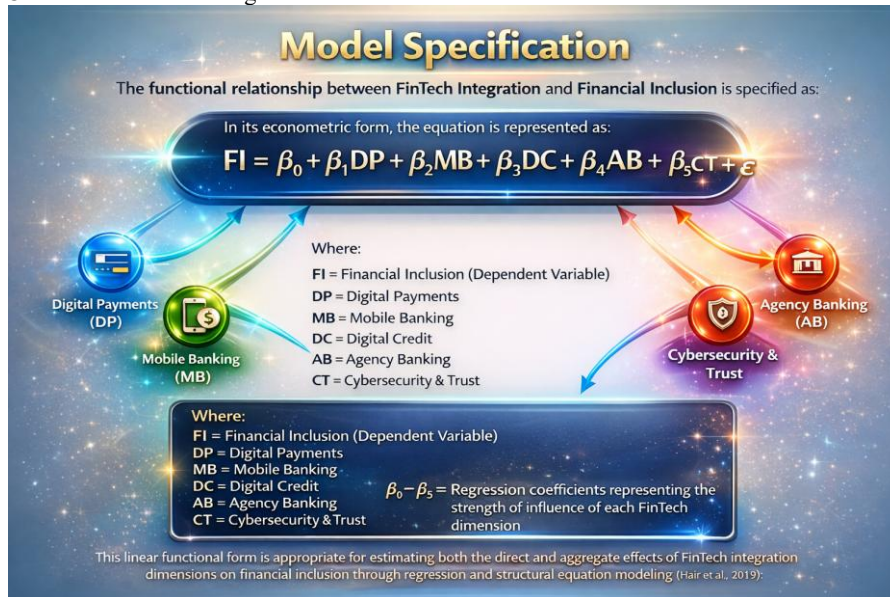
AB = Agency Banking

CT = Cybersecurity & Trust

$\beta_0$  = Constant (intercept)

$\beta_1$ – $\beta_5$  = Regression coefficients representing the strength of influence of each FinTech dimension

$\epsilon$  = Error term accounting for unobserved factors



This linear functional form is appropriate for estimating both the direct and aggregate effects of FinTech integration dimensions on financial inclusion through regression and structural equation modeling (Hair et al., 2019; Sarstedt, Ringle, & Hair, 2020).

**9. Data Analysis and Interpretation**

**9.1 Descriptive Analysis**

Respondents expressed a high positive perception of FinTech integration (Weighed Means: Digital Payments = 4.40, Mobile Banking = 4.39, CyberSecurity = 4.28, Agency Banking = 4.31, Digital Credit = 4.08). However, challenges were noted in the credit access and physical branch dependency despite adopting mobile banking.

**9.2 Hypothesis Testing**

The integrated model demonstrated exceptional explanatory power, accounting for 91.8% of the variance in financial inclusion ( $R^2 = 0.918$ ).

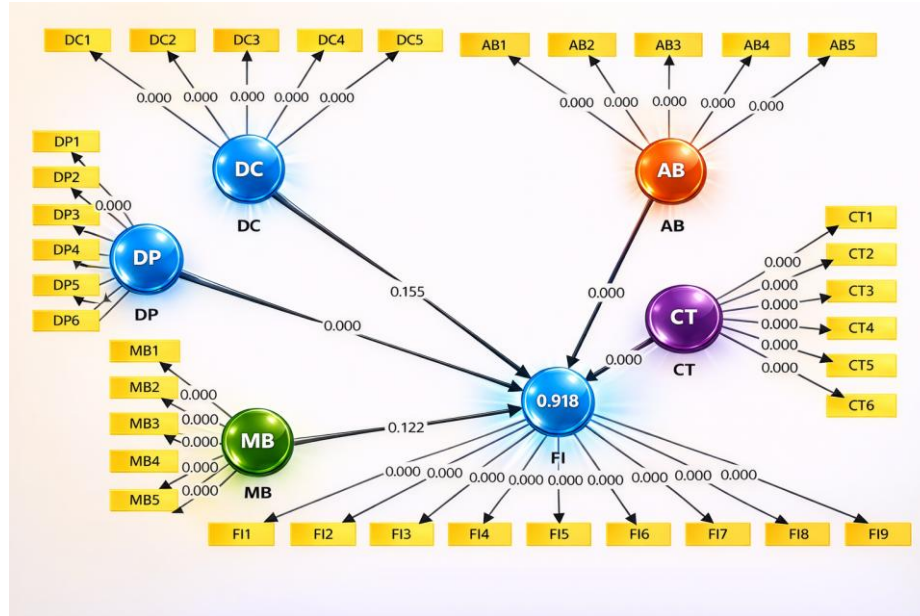
Table 8.1: Summary of Hypothesis Testing Results

Hypothesis	Path	Beta ( $\beta$ )	P-Value	Decision
H <sub>01</sub>	Digital Payments - Financial Inclusion	0.082	0.155	Fail to Reject
H <sub>02</sub>	Mobile Banking - Financial Inclusion	0.075	0.122	Fail to Reject
H <sub>03</sub>	Digital Credit - Financial Inclusion	0.128	<0.001	Reject
H <sub>04</sub>	Agency Banking - Financial Inclusion	0.166	<0.001	Reject
H <sub>05</sub>	CyberSecurity - Financial Inclusion	0.593	<0.001	Reject

Note. FI = Financial Inclusion. Individual regression results represent bivariate relationships between each predictor and financial inclusion. The discrepancy between the outcomes of individual regression of digital payments and mobile banking is worth paying attention to. The other three hypotheses that are upheld in both methods of analysis (H<sub>03</sub>, H<sub>04</sub>, and H<sub>05</sub>) are strong relationships that stand even with strict multivariate controls. These results are solid grounds that digital credit, agency banking, and cybersecurity/trust are the key drivers of financial inclusion

within the FinTech-based banking sector in Nigeria. These three dimensions jointly describe the overwhelming majority of financial inclusion results, and cybersecurity and trust are especially dominant.

**8.3 Structural Model Path Coefficient**



**Figure 9.1:** PLS-SEM Structural Model with Standardized Path Coefficients

Note. Path coefficients are standardized. Solid lines indicate significant relationships ( $p < .05$ ); dashed lines indicate non-significant relationships.  $R^2 = 0.918$  for Financial Inclusion. DP = Digital Payments; MB = Mobile Banking; DC = Digital Credit; AB = Agency Banking; CT = Cybersecurity & Trust; FI = Financial Inclusion.

The integrated structural model, as shown in Figure 8.1, has an outstanding explanatory power as it explains 91.8% of the variance in financial inclusion ( $R^2 = 0.918$ , adjusted  $R^2 = 0.917$ ), as indicated in Table 4.33. Hair et al. (2019) indicate that  $R^2$  values of 0.75, 0.50, and 0.25 are strong, moderate, and weak predictive accuracy, respectively. The observed  $R^2$  of 0.918 is well above the level of significant predictive power, and this means that the five FinTech integration dimensions have a high explanatory power in gaining an insight into the results of financial inclusion among deposit money banks in Kano Metropolis.

**9.4 Results and Discussions**

The study indicates strong positive perceptions of digital payment services among banking professionals in Kano Metropolis, with a mean score of 4.40, highlighting active promotion and enhanced service delivery by banks. Digital payments significantly impact financial inclusion, explaining 80% of variance ( $R^2 = 0.80$ ). However, when other FinTech dimensions are included, they show limited direct impact. Mobile banking similarly has a positive perception (mean = 4.39) but also lacks significant results in an integrated model, contributing 76.5% of financial inclusion variance. Online credit facilities are perceived moderately (mean = 4.08) with a variance of 69.4%, while agency banking is well-rated (mean = 4.31), accounting for 73.9% variance. Cybersecurity and trust prove critical, having the highest correlation with financial inclusion (89.3% variance). The integrated model of five FinTech dimensions explains 91.8% of financial inclusion variance, with only cybersecurity, agency banking, and digital credit showing significance. The study underscores the varying contributions of digital finance mechanisms, emphasizing the importance of trust over transactional technologies in promoting financial inclusion.

**9.5 Summary of Findings**

This study examines the effect of FinTech adoption on financial inclusion in Deposit Money Banks (DMBs) in Kano Metropolis, Nigeria, through five objectives focusing on digital payments, mobile banking, online credit, agency banking, and cybersecurity. Digital payment services received a high positive perception (mean = 4.40), significantly enhancing service delivery and accounting for 80% of financial inclusion variance ( $R^2 = 0.80$ ). Mobile banking also showed strong favor (mean = 4.39), with noted ease of fund transfer, though some operational gaps were identified. Digital credit facilities had a moderate positive rating (mean = 4.08) but exhibited diverse user experiences, explaining 69.4% of financial inclusion variance ( $R^2 = 0.694$ ). Agency banking (mean = 4.31) was recognized for improving accessibility to services, while cybersecurity measures (mean = 4.28) fostered trust through transparency and data protection efforts amongst banks.

The integrated PLS-SEM model revealed an outstanding explanatory power of 91.8% of the variance in financial inclusion ( $R^2 = 0.918$ , adjusted  $R^2 = 0.917$ ). This indicates a predictive accuracy by any standard. Of the five FinTech dimensions examined, three maintained statistical significance in the multivariate analysis:

1. Cybersecurity & Trust ( $\beta = 0.593$ ,  $p < .001$ ,  $f^2 = 0.691$ ): Large effect
2. Agency Banking ( $\beta = 0.166$ ,  $p < .001$ ,  $f^2 = 0.080$ ): Small but meaningful effect
3. Digital Credit ( $\beta = 0.128$ ,  $p < .001$ ,  $f^2 = 0.086$ ): Small but meaningful effect

Digital payments and mobile banking, although exhibiting good bivariate relationships, did not exhibit significant unique effects when other predictors were controlled ( $p = .155$  and  $p = .122$ , respectively). This trend indicates moderate multicollinearity between trust, payment systems, and mobile platforms (VIF values of 6.193, 8.721, and 9.080, respectively), which implies that the constructs overlap significantly in concept and that the bivariate effects are largely explained by the cybersecurity and trust dimension in the multivariate analysis.

**9.6 Recommendations**

Based on the empirical results and their implications, the following recommendations are suggested to various stakeholders:

1. Invest in cybersecurity and trust-building initiatives, as they are vital for financial inclusion; banks should enhance security infrastructure and communication.
2. Establish general cybersecurity standards by the Central Bank of Nigeria to ensure minimum requirements for digital financial services, including data encryption and fraud detection.

3. Improve agent banking supervision and quality by enforcing minimum standards for agent selection, training, and compliance audits to maintain service quality and protect customers.

#### 10. Conclusion

The study highlights the significant role of FinTech in enhancing financial inclusion for Deposit Money Banks in Kano Metropolis, showing that five analyzed dimensions account for 91.8% of inclusion variation. Cybersecurity and customer trust emerged as the primary drivers, accounting for 89.3% of inclusion variance, challenging the notion that technology maturity alone fosters inclusion. Agency banking and digital credit also independently contribute to inclusion, particularly in contexts of lower digital literacy and connectivity. While digital payments and mobile banking are perceived positively, they serve primarily as enabling infrastructure that relies on trust mechanisms to be effective. Ultimately, the success of financial inclusion in developing environments depends on building trust, leveraging agency networks, and offering credit through integrated platforms, creating a holistic ecosystem that fosters interaction among different FinTech dimensions.

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