

Financial Inclusion, Internet Banking and Financial Performance of Deposit Money Banks in Nigeria

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ABSTRACT

This study examined the effect of financial inclusion and internet banking on the financial performance of deposit money banks in Nigeria. Two concerns motivated the enquiry. The first is that financial exclusion has persisted in Nigeria despite a decade of regulatory effort, which raises the question of whether inclusion delivers commercial value to the banks expected to deliver it. The second is that the empirical literature has treated inclusion and digital banking as separate questions, so that each construct has been tested against undifferentiated measures of profitability rather than against the performance dimension it most plausibly affects. Anchored on the Financial Intermediation Theory, the study specified two constructs and matched each to a distinct outcome: financial inclusion, measured as a composite index of active banking agents and deposit mobilization, was matched to return on assets, while internet banking, measured as the proportion of customers actively transacting on internet and mobile platforms, was matched to return on equity. Seventeen deposit money banks with active inclusion programmes were selected purposively and observed over the period 2020 to 2026, yielding a balanced panel of 119 bank-year observations drawn from audited annual reports and Central Bank of Nigeria publications. Bank size, measured as the natural logarithm of total assets, entered both models as a control. Data were analysed using descriptive statistics, Pearson correlation, panel unit root tests and panel regression, with the Hausman test used to select between the fixed and random effects estimators. The random effects estimator was preferred in both cases. Financial inclusion exerted a positive and significant effect on return on assets ($\beta = 0.0107$, $t = 4.82$, $p = 0.0000$), and internet banking exerted a positive and significant effect on return on equity ($\beta = 0.1782$, $t = 6.47$, $p = 0.0000$). The two models accounted for 43.5 and 37.6 per cent of the variation in their respective dependent variables. The study concludes that inclusion and digital channel adoption are separate and complementary determinants of bank performance rather than interchangeable expressions of a single strategy, and recommends that banks deepen agent networks and deposit mobilization, invest in secure digital platforms alongside customer digital literacy, and that regulators treat inclusion mandates as commercially rewarding rather than as a compliance burden.

Keywords: Financial Inclusion; Internet Banking; Financial Performance; Deposit Money Banks; Bank Size; Nigeria

INTRODUCTION

Banks occupy a central place in the Nigerian economy. They mobilise savings from surplus units, allocate credit to deficit units, and transmit monetary policy into the productive sectors. Deposit money banks carry the largest share of that burden, holding the bulk of sector assets and operating the payment infrastructure on which commerce depends. How efficiently these institutions perform their intermediary function therefore matters well beyond their own balance sheets.

Two developments have reshaped the way that function is discharged. The first is financial inclusion. Successive iterations of the Central Bank of Nigeria's National Financial Inclusion Strategy have pushed banks to extend services to populations that branch networks were never designed to reach, principally through agent banking arrangements and targeted deposit mobilization (Central Bank of Nigeria, 2022). The second is the migration of transactions to digital channels. Internet and mobile platforms now handle a substantial share of retail banking activity, a shift accelerated by the pandemic and by the currency redesign episode of 2023.

Neither development is costless. Agent networks require recruitment, monitoring and liquidity support. Digital platforms require capital expenditure, continuous upgrading and cybersecurity investment that yields no direct revenue. The commercial case for either therefore rests on an empirical claim rather than a self-evident one, namely that the resulting deposits, transaction volumes and fee income exceed what the channels cost to build and maintain.

The evidence on that claim is unsettled. Ene (2024) reports that credit to small-scale enterprises raises the profitability of Nigerian banks while agricultural lending and rural banking initiatives do not, which suggests that inclusion is not a single undifferentiated activity with a single performance signature. Kolawole, Adewale and Abubakar (2025) find that digital inclusion strategies improve service delivery, yet identify infrastructure gaps, accessibility constraints and cybersecurity exposure as brakes on the expected gains. Working on tier-one banks, Aduku, Bakare, Ogedengbe, Ediuku and Owolola (2025) observe that increases in mobile transaction volumes affect performance unevenly, with the outcome contingent on operating efficiency and implementation cost. Nguyen-Thi-Huong, Nguyen-Viet, Nguyen-Phuong and Van Nguyen (2023) go further, reporting a negative association between the intensity of digital transformation and both return on assets and return on equity.

A structural feature of this literature helps explain the divergence. Studies commonly regress a single performance measure on whichever construct is under examination, so that inclusion and digital adoption are effectively treated as substitutes competing to explain the same variance. That design suppresses a possibility worth taking seriously: that the two operate through different mechanisms and therefore register on different indicators. Inclusion works through the asset side. Agent networks and deposit drives enlarge the low-cost funding base and the pool of earning assets, which is a proposition about how efficiently a bank's assets are deployed and is captured by return on assets. Internet banking works through the cost and fee structure. Digital channels displace branch transactions, compress the cost-to-income ratio and generate commission income, which accrues to shareholders and is captured by return on equity.

Matching each construct to the outcome it most plausibly affects is thus not a presentational convenience but a substantive specification choice. It also carries a testable implication, since a construct that registers on its theoretically proximate indicator while the alternative construct registers on a different one supplies stronger evidence of distinct mechanisms than any composite index could. This study adopts that design for the Nigerian deposit money banking sector over the period 2020 to 2026.

The study is guided by the following research questions:

- i. What is the effect of financial inclusion on the financial performance, measured by return on assets, of deposit money banks in Nigeria?
- ii. What effect does internet banking have on the financial performance, measured by return on equity, of deposit money banks in Nigeria?

The main objective of the study is to examine the effect of financial inclusion and internet banking on the financial performance of deposit money banks in Nigeria. The specific objectives are to:

- i. examine the effect of financial inclusion on the return on assets of deposit money banks in Nigeria; and
- ii. determine the effect of internet banking on the return on equity of deposit money banks in Nigeria.

In line with the foregoing objectives, the following null hypotheses are tested:

H01: Financial inclusion has no significant effect on the return on assets of deposit money banks in Nigeria.

H02: Internet banking has no significant effect on the return on equity of deposit money banks in Nigeria.

LITERATURE REVIEW

Financial Inclusion

Financial inclusion describes the process by which individuals and businesses, particularly those with low incomes or in underserved locations, gain access to affordable and appropriate financial products and services (Nwamбеke, Okoro & Uche, 2024). The concept is usually decomposed into access, usage and quality. Access concerns the availability of a service point; usage concerns whether an account, once opened, is actually transacted upon; quality concerns whether the product fits the customer's circumstances. The distinction matters for measurement, since account ownership counts as access but contributes nothing to a bank's earnings if the account remains dormant.

In the Nigerian setting, inclusion has been pursued largely through two channels. Agent banking places transaction points in communities where a branch would not recover its fixed cost, and deposit mobilization campaigns convert those transaction points into a funding base. Ozili (2024) documents both the progress and the persistence of exclusion across sub-Saharan Africa, noting that the determinants of inclusion are as much infrastructural and cultural as regulatory. What remains contested is whether inclusion pays. Ozili (2025) finds emerging evidence of a profitability effect, while Zhang, Chen and Liu (2023) caution that, in developed markets, inclusion translates into profit only where risk management, customer financial literacy and regulatory oversight are already strong. The caveat is relevant to Nigeria, where those complements are uneven.

For the purposes of this study, inclusion is treated as an operating activity rather than a social outcome. Measured through active agents and mobilized deposits, it describes what the bank has actually built and funded, which is the dimension on which a performance effect, if one exists, would register.

Internet Banking

Internet banking refers to the delivery of banking services through electronic channels that allow customers to transact without attending a branch (Olusanya & Ume, 2024). Its performance logic is straightforward in principle: a transaction executed on a customer's device costs a fraction of the same transaction executed at a teller window, and the channel simultaneously generates commission income while extending service hours beyond the branch day.

Empirical support for that logic is reasonably strong but not unqualified. DeYoung, Lang and Nolle (2022) find that adoption raises efficiency and profitability among United States commercial banks, largely by reducing dependence on physical networks. Bounie and Francois (2022) report higher revenue and better operating efficiency among European banks with extensive digital platforms, with income diversification as the operative mechanism. Citterio, King and Locatelli (2024), examining 279 banks across the European Union, find digital transformation positively associated with return on assets, though the effect is conditioned by information technology capability and national digital infrastructure, and they note that early investment raises costs before it lowers them.

Against these, Nguyen-Thi-Huong and colleagues (2023) report a negative association using a text-based measure of digital intensity. The contradiction is instructive rather than fatal. A count of digital vocabulary in annual reports measures how much a bank talks about digitalisation, not how many of its customers transact digitally, and the two can diverge sharply. Measurement choice, in other words, is doing much of the work that is usually attributed to context. This study accordingly measures internet banking by active usage rather than by stated adoption or platform availability.

Financial Performance

Financial performance in banking is conventionally assessed through accounting-based ratios. Return on assets relates net income to total assets and indicates how efficiently the asset base is deployed, which makes it sensitive to funding cost and to the productivity of earning assets. Return on equity relates net income to shareholders'

funds and indicates the return generated on owners' capital, which makes it sensitive to cost structure, leverage and fee income.

The two measures are correlated but not interchangeable, and the difference between them is precisely what a matched design exploits. A bank that lowers its funding cost by mobilising cheap deposits improves the asset-side ratio first. A bank that shifts transactions to a digital channel and lowers its cost-to-income ratio improves the equity-side ratio first. Testing both constructs against a single composite measure would blur that distinction and, in the process, discard information that is theoretically meaningful.

Theoretical Framework

The study is anchored on the Financial Intermediation Theory, developed by Diamond (1984). The theory holds that banks exist because they resolve information and transaction cost problems that surplus and deficit units cannot resolve bilaterally, performing delegated monitoring on behalf of depositors and pooling risk across borrowers. It follows that anything which widens the pool of surplus units a bank can reach, or lowers the cost at which it can serve them, strengthens the intermediary function and should register in performance. Financial inclusion widens the pool. Internet banking lowers the cost. The theory therefore predicts positive effects for both, while leaving open the question of which indicator each affects most directly.

Two perspectives complete the framework. The Resource-Based View, associated with Barney (1991), treats an agent network and a proprietary digital platform as firm-specific assets that competitors cannot replicate quickly, which explains why the performance gains from either would persist rather than being competed away immediately. Transaction Cost Economics, in the tradition of Williamson (1985), supplies the mechanism for the digital channel specifically: the choice between a branch transaction and a self-service transaction is a governance choice about how a service is organised, and the digital option economises on the cost of each exchange.

Taken together, the three perspectives generate the study's central proposition. Intermediation theory establishes why inclusion and digitalisation should affect performance at all; the resource-based view explains why the effects should persist; and transaction cost reasoning explains why the digital effect should surface in the cost structure and therefore in shareholder returns rather than in asset efficiency.

Empirical Review

Nigerian evidence on inclusion is broadly positive but qualified. Ibor, Offiong and Mendie (2022) establish a favourable association between inclusion and the performance of deposit money banks. Ene (2024) refines the picture by showing that the effect is channel-specific, with enterprise credit performing well and agricultural and rural initiatives performing poorly. Olaniyi and Adeoye (2023) attribute the gains to deposit growth and revenue expansion following wider access. Outside Nigeria, Mwangi and Muturi (2023) find inclusion improving profitability and credit extension among Kenyan banks, and Kaur and Kaur (2022) report comparable results for India. Slesman, Abduh and Abdul Aziz (2024) find a positive cross-country effect of digital financial inclusion on bank profitability.

On digital channels, Adegboyega, Ariyibi, Olaiya and Yunusa (2022) report that electronic banking improves the efficiency and profitability of Nigerian banks, a finding echoed by Kabir, Abubakar and Aminu (2021) across automated teller machine, mobile and internet channels, and by Fatade, Balogun and Yusuf (2025) for listed deposit money banks. International evidence points the same way in DeYoung et al. (2022) and Rao and Sridhar (2023), while Martinez-Perez and Santillan (2024) add that digital maturity confers resilience during shocks as well as higher returns.

Two features of this body of work bear on the present design. First, the studies that report the strongest effects tend to measure usage rather than availability, which supports the measurement choice adopted here. Second, almost all of them regress a single profitability measure on whichever construct is under study, so the question of whether inclusion and digital adoption register on different indicators has not been posed directly. Where both

constructs appear together, they are typically entered as competing regressors in one equation, which tests their relative explanatory weight rather than their distinct mechanisms.

Gaps in Literature

Three deficiencies emerge from the reviewed evidence. Inclusion and internet banking have generally been examined in isolation, so that no clear account exists of how each relates to a distinct dimension of bank performance within a common sample and period. Where performance is operationalised, it is usually reduced to one undifferentiated profitability measure, which forecloses the possibility that different mechanisms surface in different ratios. And the Nigerian evidence base predates or only partially covers the period in which agent banking reached scale and digital transactions became the dominant retail channel, a period that includes the pandemic and the 2023 currency redesign. This study addresses these gaps by estimating two theoretically matched models on a balanced panel covering 2020 to 2026.

METHODOLOGY

An ex-post facto research design was adopted within a quantitative framework. The design suits the enquiry because the variables of interest are historical, already recorded in audited financial statements and regulatory returns, and beyond the researcher's manipulation. Since the data combine a cross-sectional dimension across banks with a time-series dimension across years, they were assembled as a panel, which exploits both sources of variation, controls for unobserved bank-specific heterogeneity and improves estimation efficiency.

The population comprised the twenty-three deposit money banks licensed by the Central Bank of Nigeria and operating in Nigeria as at the end of the study window (Central Bank of Nigeria, 2023). A purposive sampling technique was used to select seventeen banks, on two criteria: the bank operated an active financial inclusion programme during the period, and complete data on all study variables were available for every year. Banks whose operations were confined to corporate or high-net-worth segments, and newer institutions without a full data record, were excluded on the ground that inclusion activity is not a meaningful construct for them. The seventeen sampled banks observed over the seven years from 2020 to 2026 yielded a balanced panel of 119 bank-year observations.

The study relied exclusively on secondary data. Performance and total asset figures were extracted from audited annual reports and accounts. Agent banking penetration, deposit mobilization and digital channel usage figures were drawn from the same reports and from Central Bank of Nigeria statistical bulletins and regulatory publications. A structured extraction schedule was applied to keep measurement consistent across banks and years.

Financial performance, the dependent construct, was measured through two proxies. Return on assets (ROA) was measured as net income to total assets. Return on equity (ROE) was measured as net income to total equity. Financial inclusion (FINC) was measured as a composite index of active banking agents and deposit mobilization. Internet banking (INTB) was measured as the proportion of a bank's customers actively transacting on internet or mobile banking platforms, a usage-based rather than availability-based measure. Bank size (BS), entered as a control in both equations, was measured as the natural logarithm of total assets.

Two models were specified to correspond with the study objectives:

Model 1 (Objective i):

$$ROA_{it} = \beta_0 + \beta_1 FINC_{it} + \beta_2 BS_{it} + \mu_i + \varepsilon_{it}$$

Model 2 (Objective ii):

$$ROE_{it} = \beta_0 + \beta_1 INTB_{it} + \beta_2 BS_{it} + \mu_i + \varepsilon_{it}$$

where ROA denotes return on assets, ROE denotes return on equity, FINC denotes financial inclusion, INTB denotes internet banking, BS denotes bank size, *i* indexes banks, *t* indexes years, β_0 is the intercept, β_1 and β_2

are slope coefficients, μ_i is the individual bank effect and ε_{it} is the stochastic error term. Each objective was modelled separately in order to preserve the theoretical correspondence between a given construct and the performance dimension it is expected to affect. A priori, β_1 and β_2 were expected to be positive in both equations.

Analysis proceeded in four stages. Descriptive statistics were computed to characterise the distribution of each variable, including the Jarque-Bera test of normality. A Pearson correlation matrix was estimated to establish the direction and strength of bivariate association and to screen for multicollinearity. Stationarity was examined at first difference using the Levin, Lin and Chu test, the Im, Pesaran and Shin test, and the ADF-Fisher and PP-Fisher tests, in order to guard against spurious regression. Each model was then estimated by pooled ordinary least squares, fixed effects and random effects, with the Hausman specification test used to select between the latter two; where the Hausman statistic was insignificant at the five per cent level, the random effects estimator was preferred. Hypotheses were tested at the five per cent level using the t-statistics of the individual coefficients, with model adequacy assessed through the coefficient of determination, the F-statistic, the root mean squared error and the Durbin-Watson statistic.

RESULTS AND DISCUSSION

Descriptive Statistics

Table 1

Descriptive Statistics of Study Variables

Statistic	FINC	INTB	BS	ROA	ROE
Mean	1.765277	0.449438	7.664331	0.042452	0.254172
Median	1.706507	0.432998	7.540100	0.041805	0.245338
Maximum	3.023208	0.811500	9.600899	0.068127	0.401640
Minimum	0.536378	0.158437	5.776881	0.015078	0.147395
Std. Dev.	0.513847	0.136735	0.948015	0.011203	0.048333
Skewness	0.045943	0.205098	-0.122583	0.129323	0.603721
Kurtosis	2.767787	2.819797	2.243258	2.478888	3.150183
Jarque-Bera	0.309229	0.995306	3.137458	1.678175	7.340662
Probability	0.856745	0.607956	0.208310	0.432105	0.025468
Observations	119	119	119	119	119

Source: Researcher's Computation (2026)

The sampled banks recorded a mean financial inclusion index of 1.765 and mean internet banking penetration of 0.449, the latter implying that roughly 45 per cent of customers transacted actively on digital platforms over the period. Mean bank size of 7.664 in logarithmic terms corresponds to total assets of approximately ₦2.13 trillion. Mean return on assets stood at 4.25 per cent and mean return on equity at 25.42 per cent, which places the sampled institutions within a reasonable band for the sector.

Dispersion differs markedly across the variables and is itself informative. The standard deviation of the inclusion index, 0.514 against a mean of 1.765, indicates that inclusion effort varies widely between banks; internet banking, at 0.137 against a mean of 0.449, is comparatively uniform, which is consistent with digital channels having become an industry standard rather than a point of differentiation. Bank size shows the widest dispersion of the explanatory variables, reflecting the coexistence of tier-one institutions and much smaller banks within the sample. On the performance side, return on assets is tightly clustered while return on equity varies more, a pattern that would be expected given differences in leverage and cost structure.

Distributional properties support the use of parametric estimation. The inclusion index, internet banking, return on assets and bank size are close to symmetric, and their Jarque-Bera probabilities exceed the five per cent threshold. Return on equity is moderately right-skewed, with a probability of 0.025 that marginally violates normality, indicating that a small number of banks report unusually strong shareholder returns. Kurtosis for most variables falls below three, so extreme observations are not a serious concern.

Table 2

Correlation Matrix of Study Variables

	FINC	INTB	BS	ROA	ROE
FINC	1.0000	0.5531	0.7198	0.6357	0.4662
INTB	0.5531	1.0000	0.4006	0.5312	0.5896
BS	0.7198	0.4006	1.0000	0.5803	0.3900
ROA	0.6357	0.5312	0.5803	1.0000	0.7276
ROE	0.4662	0.5896	0.3900	0.7276	1.0000

Source: Researcher's Computation (2026)

The correlation structure anticipates the regression results in a way that supports the matched design. Financial inclusion correlates more strongly with return on assets ($r = 0.636$) than with return on equity ($r = 0.466$), while internet banking correlates more strongly with return on equity ($r = 0.590$) than with return on assets ($r = 0.531$). The ordering is what the theoretical argument predicts, although the margins are modest and no causal weight can be placed on bivariate coefficients.

Inclusion and bank size are strongly associated ($r = 0.720$), which is unsurprising since agent networks are expensive to build and larger banks have deeper balance sheets to fund them. The value falls below the conventional 0.80 threshold, and no other pairwise correlation among the regressors approaches it, so multicollinearity does not appear severe. The two performance measures correlate at 0.728, high enough to confirm that both capture profitability but low enough to leave the distinct variance that the two models exploit.

Table 3

Panel Unit Root Test Results at First Difference

Series	LLC Test	IPS Test	ADF-Fisher	PP-Fisher	Decision (5% level)
D(FINC)	-15.327 (0.0000)	-12.323 (0.0000)	245.622 (0.0000)	386.410 (0.0000)	Stationary, I(1)

Series	LLC Test	IPS Test	ADF–Fisher	PP–Fisher	Decision (5% level)
D(INTB)	–11.852 (0.0000)	–7.886 (0.0000)	177.993 (0.0000)	227.891 (0.0000)	Stationary, I(1)
D(BS)	–15.033 (0.0000)	–11.949 (0.0000)	273.498 (0.0000)	393.278 (0.0000)	Stationary, I(1)
D(ROA)	–11.115 (0.0000)	–6.944 (0.0000)	150.660 (0.0000)	179.701 (0.0000)	Stationary, I(1)
D(ROE)	–12.129 (0.0000)	–8.239 (0.0000)	170.812 (0.0000)	214.611 (0.0000)	Stationary, I(1)

Source: Researcher's Computation (2026); *p*-values in parentheses

All five series are stationary at first difference across the four tests, with every test statistic significant at the one per cent level. The variables are therefore integrated of order one, and the risk of spurious regression is contained.

Regression Results

Table 4

Model 1: Effect of Financial Inclusion on Return on Assets

Variable	Pooled OLS	Fixed Effects	Random Effects
C (Constant)	0.0020 (0.29, 0.7760)	–0.0693 (–1.08, 0.2828)	0.0023 (0.27, 0.7868)
FINC (Financial Inclusion)	0.0099 (4.50, 0.0000)	0.0102 (3.47, 0.0008)	0.0107 (4.82, 0.0000)
BS (Bank Size)	0.0030 (2.54, 0.0126)	0.0122 (1.39, 0.1685)	0.0028 (2.03, 0.0442)
R-squared	0.435	0.564	0.435
Adjusted R-squared	0.426	0.485	0.425
F-statistic (p-value)	44.72 (0.0000)	7.177 (0.0000)	44.59 (0.0000)
Root MSE	0.00838	0.00737	0.00839
Durbin-Watson	2.131	2.527	2.130

Source: Researcher's Computation (2026); coefficients reported with *t*-statistic and *p*-value in parentheses.
Dependent variable: ROA.

Table 5

Hausman Specification Test for Model 1

Test Type	Chi-Sq. Statistic	Df	Prob.	Decision
Cross-section random	4.055	2	0.1317	Random effects preferred

Source: Researcher's Computation (2026)

The Hausman statistic is insignificant ($p = 0.1317$), so the random effects estimates are interpreted. Financial inclusion carries a positive coefficient of 0.0107 that is significant at the one per cent level ($t = 4.82$, $p = 0.0000$). A one-unit increase in the inclusion index is associated with an increase of roughly 1.07 percentage points in return on assets, holding bank size constant. The estimated relationship is $ROA = 0.0023 + 0.0107FINC + 0.0028BS$.

Bank size is also positive and significant ($\beta = 0.0028$, $p = 0.0442$), consistent with scale economies in asset deployment. The model accounts for 43.5 per cent of the variation in return on assets and is significant overall, $F = 44.59$, $p = 0.0000$. A Durbin-Watson statistic of 2.130 gives no indication of serial correlation in the residuals. Notably, the inclusion coefficient is stable across all three estimators, ranging only from 0.0099 to 0.0107, which suggests the result is not an artefact of the estimator chosen.

Table 6

Model 2: Effect of Internet Banking on Return on Equity

Variable	Pooled OLS	Fixed Effects	Random Effects
C (Constant)	0.1006 (3.48, 0.0007)	-0.1155 (-0.36, 0.7226)	0.0979 (2.10, 0.0380)
INTB (Internet Banking)	0.1825 (6.45, 0.0000)	0.1541 (3.50, 0.0007)	0.1782 (6.47, 0.0000)
BS (Bank Size)	0.0093 (2.29, 0.0239)	0.0392 (0.88, 0.3790)	0.0099 (1.55, 0.1239)
R-squared	0.376	0.582	0.376
Adjusted R-squared	0.365	0.507	0.365
F-statistic (p-value)	34.91 (0.0000)	7.728 (0.0000)	34.89 (0.0000)
Root MSE	0.03803	0.03113	0.03803
Durbin-Watson	1.395	1.958	1.395

Source: Researcher's Computation (2026); coefficients reported with *t*-statistic and *p*-value in parentheses. Dependent variable: ROE.

Table 7

Hausman Specification Test for Model 2

Test Type	Chi-Sq. Statistic	Df	Prob.	Decision
Cross-section random	0.496	2	0.7803	Random effects preferred

Source: Researcher's Computation (2026)

The Hausman result again favours random effects ($p = 0.7803$). Internet banking carries a coefficient of 0.1782, significant at the one per cent level ($t = 6.47$, $p = 0.0000$). Interpreted at a practical margin, a ten-percentage-point rise in the share of customers transacting actively on digital platforms is associated with an increase of approximately 1.78 percentage points in return on equity. The estimated relationship is $ROE = 0.0979 + 0.1782INTB + 0.0099BS$.

Bank size loses significance in this specification ($\beta = 0.0099$, $p = 0.1239$), which is a more interesting result than it first appears. Where asset efficiency rewards scale, shareholder returns in this sample do not: once the extent of digital adoption is accounted for, the size of a bank adds nothing further to the explanation. What differentiates banks on this measure is how effectively they have moved customers onto digital channels, and that is a capability smaller institutions can acquire without first acquiring scale. The model explains 37.6 per cent of the variation in return on equity and is significant overall, $F = 34.89$, $p = 0.0000$. The Durbin-Watson statistic of 1.395 sits at the lower end of the acceptable range and points to mild positive serial correlation, which is common in panels where observations on the same institution are correlated over time and which should temper the precision attached to the standard errors.

Test of Hypotheses

Table 8

Summary of Hypothesis Testing

Hypothesis	Relationship Tested	β	t-Statistic	p-value	Decision ($\alpha = 0.05$)
H01	FINC $\rightarrow$ ROA	0.0107	4.82	0.0000	Reject H01
H02	INTB $\rightarrow$ ROE	0.1782	6.47	0.0000	Reject H02

Source: Researcher's Computation (2026)

Both null hypotheses are rejected at the five per cent level. Financial inclusion significantly affects return on assets, and internet banking significantly affects return on equity.

Discussion Of Findings

The inclusion result carries a straightforward reading in intermediation terms. Banks that build agent networks and pursue deposit mobilization enlarge the pool of surplus units they can reach, and the resulting low-cost deposits fund earning assets at a lower average cost than wholesale alternatives. That the effect surfaces in return on assets rather than return on equity is consistent with the mechanism, since the gain accrues on the asset side before any of it reaches shareholders. The direction agrees with Ibor, Offiong and Mendie (2022), Ene (2024) and Ozili (2025) for Nigeria, with Mwangi and Muturi (2023) for Kenya, and with Kaur and Kaur (2022) for India.

The finding does need to be set against Ene's (2024) observation that inclusion channels differ sharply in their profitability. The composite index used here cannot distinguish an agent network that generates transaction volume from one that merely exists, nor can it separate deposit mobilization in a commercially viable market from mobilization pursued to satisfy a regulatory target. A positive average effect is therefore compatible with substantial variation beneath it, and the practical implication is about which inclusion activities banks choose rather than about inclusion in the aggregate.

The internet banking result is stronger in magnitude and equally consistent with the theoretical account. Active digital usage compresses the cost of serving each customer and generates commission income, both of which flow to the equity holder, and the effect duly appears in return on equity. The result aligns with Adegboyega and colleagues (2022), Kabir, Abubakar and Aminu (2021) and Fatade, Balogun and Yusuf (2025) within Nigeria, and with DeYoung, Lang and Nolle (2022) and Rao and Sridhar (2023) internationally.

It also stands against Nguyen-Thi-Huong and colleagues (2023), who report a negative digital effect. The divergence is best explained by measurement rather than by context. Their proxy counts digital terminology in annual reports, which registers intent and expenditure; the proxy used here counts customers who actually transact digitally, which registers realised migration. A bank can spend heavily on a platform nobody uses, and

such a bank would score high on the first measure and low on the second while its performance deteriorated. Read together, the two studies suggest that what pays is not digital investment but digital adoption, a distinction that matters considerably for how banks appraise their technology budgets.

Two features of the results deserve emphasis beyond the individual coefficients. The first is the divergent behaviour of bank size, significant for asset efficiency and insignificant for shareholder returns, which indicates that scale advantages are specific to the asset side rather than general. The second is the ordering of the correlations noted earlier, where each construct associates most strongly with the outcome the theory assigns to it. Neither observation constitutes proof of distinct mechanisms, but both are consistent with the proposition and would have been invisible under a design that regressed both constructs on a single composite measure of profitability.

Explanatory power of 43.5 and 37.6 per cent is respectable for panel models of bank profitability, but it also means that most of the variation lies elsewhere, in credit quality, macroeconomic conditions, exchange rate movements and operating cost structure. Inclusion and digital adoption operate alongside these determinants rather than in place of them, and the coefficients reported here should be read as measures of a contribution rather than of a controlling influence.

SUMMARY, CONCLUSION AND RECOMMENDATIONS

Summary

This study examined the effect of financial inclusion and internet banking on the financial performance of deposit money banks in Nigeria between 2020 and 2026. Adopting an ex-post facto design and a balanced panel of 119 bank-year observations from seventeen purposively selected banks, it specified two constructs and matched each to a distinct performance outcome: financial inclusion to return on assets, and internet banking to return on equity, with bank size controlled in both equations. Estimation proceeded through pooled ordinary least squares, fixed effects and random effects, with the Hausman test selecting the random effects estimator in both models.

Financial inclusion exerted a positive and significant effect on return on assets ($\beta = 0.0107$, $t = 4.82$, $p = 0.0000$), with the model explaining 43.5 per cent of the variation in the dependent variable and bank size entering significantly as a control. Internet banking exerted a positive and significant effect on return on equity ($\beta = 0.1782$, $t = 6.47$, $p = 0.0000$), with the model explaining 37.6 per cent of the variation and bank size proving insignificant. Both null hypotheses were rejected at the five per cent level.

Conclusion

Financial inclusion and internet banking are measurable determinants of bank performance in Nigeria, and they operate through separate channels rather than as interchangeable expressions of a single modernisation strategy. Banks that extend agent networks and mobilise deposits from previously underserved populations convert that reach into stronger asset returns, which supports the case for treating inclusion as a commercial activity rather than a regulatory obligation. Banks that succeed in moving customers onto internet and mobile platforms record stronger shareholder returns, and the size of that effect suggests the digital channel is currently the more powerful of the two levers.

These conclusions carry qualifications that should not be set aside. The models explain a minority of the variation in performance, so the constructs examined here operate alongside credit quality, cost discipline and macroeconomic conditions rather than dominating them. The insignificance of bank size in the equity equation, set against its significance in the asset equation, indicates that the scale advantage in Nigerian banking is narrower than is often assumed and does not extend to the returns that accrue to owners. And because the composite inclusion index cannot distinguish between productive and nominal inclusion activity, the positive average effect reported here should not be read as an endorsement of every initiative that carries the inclusion label.

Recommendations

1. Deposit money banks should continue to extend agent banking networks into underserved rural and semi-urban communities and to deepen deposit mobilization, since inclusion effort translated into measurably higher returns on assets across the sample.
2. Banks should direct inclusion spending towards channels that generate transaction volume rather than towards those that satisfy reporting targets, given evidence that inclusion activities differ substantially in their commercial return.
3. Investment in internet and mobile platforms should be paired with customer digital literacy campaigns and visible cybersecurity safeguards, because the performance effect documented here attaches to active usage rather than to platform availability.
4. Smaller banks in particular should treat digital channel adoption as a competitive instrument, since shareholder returns in this sample were driven by digital usage and not by institutional scale.
5. The Central Bank of Nigeria should frame inclusion mandates around active usage indicators rather than account or agent counts, so that regulatory measurement tracks the activity that actually carries a performance effect.
6. Investors and analysts appraising Nigerian banking equities should treat the proportion of customers transacting digitally as a material performance signal, distinct from and more informative than disclosed technology expenditure.

Contribution to Knowledge

Theoretically, the study extends the application of intermediation theory to bank performance by showing that two distinct operating constructs register on two distinct performance dimensions within a single sample and period, a proposition that composite performance measures are structurally unable to test. Methodologically, it contributes by measuring internet banking through active customer usage rather than through platform availability or disclosed digital investment, a distinction that reconciles the otherwise contradictory findings in the existing literature, and by matching each construct to the outcome theoretically proximate to it rather than regressing both on a common profitability proxy. Empirically, it supplies Nigerian evidence covering 2020 to 2026, a window that includes the pandemic and the currency redesign episode, that inclusion improves return on assets and digital adoption improves return on equity, while establishing that the scale advantage enjoyed by larger banks does not extend to shareholder returns. For policy and practice, it reframes financial inclusion as a commercially rewarding activity rather than a compliance cost, and offers regulators a measurement principle, grounded in usage rather than access, for assessing whether inclusion mandates are achieving their intended effect.

Suggestions for Further Studies

Three extensions would strengthen the evidence base. The interaction between inclusion and digital adoption, and the possibility that bank size conditions either relationship, fall outside the two-model specification adopted here and warrant separate treatment. A longer horizon estimated by dynamic panel methods, such as the system generalised method of moments, would address the potential endogeneity between inclusion strategy and performance that a static panel cannot resolve. And a design that disaggregates the inclusion index into its component channels would test directly whether the variation in commercial return across inclusion activities, suggested by earlier Nigerian evidence, holds within this period and sample.

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