The scale **Journal Website:** https://thescalejournal.com.ng/
An Interdisciplinary Journal of
The ACADEMIC STAFF UNION OF POLYTECHNICS - ZONE D
ISSN: 2992-3727 Published 30th November, 2025

EXAMINING THE IMPACT OF BLOCKCHAIN ADOPTION ON FINANCIAL PERFORMANCE: THE MODERATING EFFECTS OF REGULATORY COMPLIANCE CAPABILITY AND CYBERSECURITY MATURITY AMONG NIGERIAN FINTECH FIRMS

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ABSTRACT
This study investigated the effect of blockchain adoption on the financial performance of fintech companies in Nigeria, emphasizing the moderating roles of regulatory compliance capability and cybersecurity maturity. Using an explanatory research design, panel data from 60 fintech firms covering the period 2019–2024 were analyzed. Both primary data, obtained through structured questionnaires, and secondary data from audited financial statements were employed. Data were analyzed using descriptive statistics, correlation analysis, and fixed-effects panel regression with robust standard errors. The results revealed that blockchain adoption intensity significantly and positively influences financial performance, measured by return on assets (ROA) and revenue growth. Furthermore, regulatory compliance capability and cybersecurity maturity were found to strengthen this positive relationship, indicating that firms with stronger compliance systems and advanced cybersecurity frameworks derive greater financial benefits from blockchain implementation. The study concludes that blockchain technology enhances fintech companies' profitability and growth, but its effectiveness depends on institutional readiness and governance quality. It recommends that fintech firms integrate blockchain strategically with compliance and cybersecurity frameworks, while regulators should provide clearer policies and regulatory sandboxes to foster innovation.

Keywords: Blockchain adoption, financial performance, fintech companies, regulatory compliance capability, cybersecurity maturity.

INTRODUCTION
The emergence of blockchain technology has revolutionized the global financial landscape by providing a secure, decentralized, and transparent mechanism for recording and verifying transactions. Originally conceptualized to power Bitcoin in 2008 by Satoshi Nakamoto, blockchain has since evolved into a multipurpose distributed ledger technology (DLT) with applications across industries particularly in finance, supply chain, auditing, and data governance (Nakamoto, 2008; Casino et al., 2019). Blockchain's fundamental attributes; immutability, transparency, consensus-driven verification, and cryptographic security make it a key driver of trust in digital financial ecosystems (Yli-Huumo et al., 2016). Its application within financial services reduces reliance on intermediaries, accelerates settlements, and enhances auditability, thereby potentially improving organizational efficiency and profitability (Chen et al., 2021). Globally, fintech companies have been at the forefront of blockchain adoption. Fintech refers to the integration of technology and innovation in financial services delivery, encompassing payment systems, peer-to-peer lending, insurance tech, wealth management, and digital banking (Gomber et al., 2017). Studies indicate that blockchain adoption in fintech enhances cost efficiency, data integrity,

customer trust, and transaction security (Tapscott & Tapscott, 2018; Schueffel, 2017). Furthermore, blockchain's ability to support smart contracts, decentralized finance (DeFi), and digital identity verification has enabled fintech companies to design new business models and access unbanked populations (Kouhizadeh & Sarkis, 2018; Catalini & Gans, 2020).

In emerging economies such as Nigeria, blockchain adoption has gained significant traction amid the rise of a vibrant fintech ecosystem. Nigeria hosts Africa's largest fintech market, with firms such as Flutterwave, Paystack, and Interswitch driving innovation in payment systems, remittances, and digital lending (PwC, 2023). According to the *CBN Fintech Strategy Report* (2022), the country's fintech sector grew by over 200 percent between 2017 and 2022, powered by smartphone penetration, youthful demographics, and increasing digital financial inclusion. However, this expansion is also accompanied by challenges relating to regulatory uncertainty, cybersecurity threats, and limited blockchain literacy (Onyekwere te al., 2023). Blockchain offers Nigerian fintech firms a potential avenue to enhance efficiency, reduce fraud, and strengthen consumer confidence. For instance, distributed ledgers can improve KYC/AML processes, automate compliance reporting, and reduce transaction errors (Adelakun & Ogunyemi, 2024). Moreover, blockchain-enabled payments and cross-border remittances promise faster, cheaper, and more transparent settlements (World Bank, 2024). Despite these prospects, empirical evidence on the actual financial performance outcomes such as return on assets (ROA), return on equity (ROE), and profitability remains limited in Nigeria's fintech industry (Liao et al., 2025). Understanding the extent to which blockchain adoption affects the financial performance of fintech firms is thus critical for entrepreneurs, investors, and policymakers seeking to optimize technology investments and regulatory frameworks in the Nigerian financial ecosystem.

Although blockchain technology has received substantial attention as a transformative tool for financial innovation, its measurable impact on firm-level performance remains an under-researched area particularly in developing economies like Nigeria. Most existing studies emphasize blockchain's technical capabilities and strategic potential, yet there is scant empirical work linking blockchain adoption to quantifiable indicators of financial performance such as profitability, liquidity, or return on investment (Al-Okaily, 2025; Li, 2025). In Nigeria, fintech companies are increasingly experimenting with blockchain for payments, digital identity, asset tokenization, and compliance management (CBN, 2022; Onyekwere et al., 2023). However, adoption levels are uneven, ranging from pilot initiatives to full-scale integration. Many firms also face high costs of implementation, regulatory ambiguity, interoperability issues, and cybersecurity risks (Ezeani & Nwokoma, 2024). These factors complicate the assessment of blockchain's effectiveness and may even offset potential financial benefits if not well-managed (Kouhizadeh & Sarkis, 2018; Wu et al., 2024). The Nigerian regulatory environment presents additional complexities. While the Central Bank of Nigeria has encouraged innovation through frameworks like the *Regulatory Sandbox* (CBN, 2023), policy inconsistencies such as prior restrictions on cryptocurrency trading have created uncertainty around blockchain deployment in financial services. This regulatory volatility limits both investor confidence and long-term adoption planning (Adelakun & Ogunyemi, 2024). Consequently, there is a dearth of consistent empirical data assessing whether blockchain investments enhance financial performance or merely serve as strategic signaling tools for funding and market positioning.

Moreover, firm-level performance outcomes from blockchain adoption may depend on moderating capabilities such as regulatory compliance, cybersecurity maturity, and organizational agility (Catalini & Gans, 2020; Xie et al., 2023). Without robust measurement and control for these factors, conclusions about blockchain's value addition risk being speculative. Therefore, a systematic, Nigeria-specific study that quantifies blockchain adoption intensity and evaluates its effect on fintech companies' financial performance is urgently needed. This research thus seeks to fill that empirical gap by developing a

measurable blockchain adoption index and testing its relationship with accounting-based and valuation-based performance indicators among Nigerian fintech companies.

Objectives of the Study

Main Objective: To evaluate the effect of blockchain adoption on the financial performance of fintech companies in Nigeria.

Specific Objectives:

i. Develop and validate a Blockchain Adoption Intensity Index (BAI) for Nigerian fintech companies.
ii. Assess the effect of blockchain adoption on accounting-based performance (e.g., ROA/ROE, net margin).
iii. Assess the effect on market-/valuation-based performance (e.g., proxy via revenue growth, funding milestones, or Tobin's Q for listed/quoted entities where applicable).
iv. Examine the moderating role of regulatory clarity/compliance capability and cybersecurity maturity.
v. Test robustness across fintech segments (payments, lending, wealthtech, etc.) and firm size/age.

Research Hypotheses

i. H1: Blockchain adoption intensity is positively associated with accounting-based financial performance (e.g., ROA/ROE).
ii. H2: Blockchain adoption intensity is positively associated with valuation-/growth-based performance indicators.
iii. H3: Regulatory clarity/compliance capability positively moderates the relationship between blockchain adoption and performance.
iv. H4: Cybersecurity maturity positively moderates the relationship between blockchain adoption and performance.
v. H5: The blockchain–performance relationship differs significantly across fintech segments and by firm size/age.

LITERATURE REVIEW

Early empirical studies primarily explored blockchain's financial benefits through operational efficiency and transaction cost reduction. Catalini and Gans (2020) found that blockchain adoption significantly reduces verification and networking costs across financial transactions, resulting in improved firm profitability. Using a dataset of 180 international fintech companies, they demonstrated that blockchain's decentralized nature eliminates reconciliation delays and enhances trust, thereby increasing operational efficiency and net margins. Similarly, Wu et al. (2024) employed a panel dataset of 142 Asian fintech firms from 2015 to 2022 and observed that blockchain adoption had a statistically significant and positive effect on return on assets (ROA) and Tobin's Q. Their study highlighted that firms integrating blockchain into core operations such as payments, risk management, and customer verification experienced better asset utilization and market valuation. However, they cautioned that excessive investment without adequate cybersecurity frameworks could erode performance gains.

In a large-scale cross-country study, Li (2025) analyzed blockchain investments among 250 emerging-market firms and confirmed a positive relationship between blockchain adoption and both accounting-based and market-based performance indicators. The study used a composite "Blockchain Investment Index" and found that adoption improves return on equity (ROE) by 7–9 percent annually, mainly through improved operational transparency and fraud mitigation. In contrast, Al-Okaily (2025) discovered a curvilinear relationship in Middle-Eastern and Asian fintech firms showing that while moderate

blockchain investment enhances profitability, excessive investment results in diminishing returns due to high integration and maintenance costs. The study concluded that blockchain's short-term financial benefits are contingent upon organizational learning and digital maturity. Liao et al. (2025) further expanded on this by analyzing 320 technology-oriented firms listed in China, revealing that blockchain investment improves financial performance indirectly through improved information disclosure quality and investor confidence. Their findings supported the signaling theory, suggesting that firms implementing blockchain gain reputational benefits that translate into better market valuation. A European study by Khan, Yoon, and Kim (2022) employed structural-equation modeling to examine the relationship between blockchain integration, innovation intensity, and profitability in 70 fintech startups across Germany and the UK. They found that innovation capability mediates the blockchain–performance link firms with higher R&D investment derived greater benefits from blockchain technology.

Furthermore, Chen et al. (2021) demonstrated that blockchain enhances efficiency by reducing verification time and transaction costs across supply-chain finance institutions in Singapore. Using a difference-in-differences (DiD) approach, they observed a 15% increase in profitability after firms integrated smart contracts into credit operations. Meanwhile, some studies found neutral or negative effects. Ghosh and Sharma (2023) examined 100 fintech firms in India and reported that blockchain adoption did not significantly influence profitability due to high operational costs and limited skilled labor. They argued that blockchain's benefits require a critical adoption threshold, below which returns remain marginal. Similarly, Ahern (2023) emphasized that the absence of standardized regulatory frameworks in developing markets leads to underutilization of blockchain's potential financial benefits.

Across Sub-Saharan Africa, emerging empirical literature links blockchain adoption with financial inclusion and cost efficiency rather than pure profitability. Osei-Assibey and Boateng (2022) studied 60 Ghanaian fintech firms and discovered that blockchain adoption improved transaction accuracy, reduced processing time by 22%, and increased customer satisfaction, all contributing to revenue growth and profitability. However, they noted that firms faced high energy and infrastructure costs that offset part of these gains. In Kenya, Mutua (2023) analyzed 45 blockchain-enabled fintech startups and found that blockchain positively influenced firm liquidity and capital adequacy ratios through reduced fraud and faster settlements. Yet, the relationship between blockchain adoption and profitability was statistically insignificant, implying that financial performance improvements manifest over longer periods. Abubakar and Mohammed (2023) conducted a comparative study across Nigeria, South Africa, and Ghana, concluding that blockchain adoption improves firm resilience and risk management but the magnitude of effect depends on the strength of regulatory frameworks. They noted that in markets with clearer licensing guidelines such as South Africa, the impact on profitability is more pronounced.

Empirical studies focusing on Nigeria are still limited but emerging. Onyekwere et al. (2023) examined 40 Nigerian fintech firms using survey-based regression analysis and found that blockchain adoption significantly reduced fraud incidence and transaction costs, indirectly improving ROA and ROE. However, they cautioned that poor interoperability with legacy systems and lack of blockchain-skilled personnel restricted scalability. Ezeani and Nwokoma (2024) investigated regulatory uncertainty and blockchain adoption among Nigerian fintech companies. Using partial least squares structural-equation modeling (PLS-SEM), they found that while blockchain adoption improved transparency and customer trust, it did not translate into significant short-term profitability due to the cost of regulatory compliance. The study emphasized the mediating role of regulatory clarity in the blockchain–performance relationship. Adelakun and Ogunyemi (2024) analyzed panel data from 2017 to 2022 covering 25 licensed Nigerian fintech companies and discovered a positive and significant impact of blockchain adoption on financial performance indicators such as net margin and revenue growth. They reported that blockchain adoption led to a 12% reduction in fraud losses and an 8% increase in transaction volumes. Nevertheless,

cybersecurity costs increased simultaneously, implying that firms must balance innovation with security spending.

A qualitative study by Okonkwo and Eze (2023) using interviews with fintech executives revealed that blockchain improves investor confidence and brand perception but that weak infrastructure and inconsistent regulations hamper full financial returns. They noted that many fintech firms adopt blockchain as a strategic signaling tool to attract venture capital rather than as a cost-efficiency driver. Similarly, Ogunlaja and Oluwole (2023) surveyed 50 Nigerian digital-payment firms and found that blockchain adoption had a moderate positive effect on firm liquidity and operational efficiency but an insignificant effect on net profit due to high integration costs and employee retraining expenditures. A more recent econometric analysis by Adesina and Balogun (2025) employing firm-level data from the *Fintech Association of Nigeria* database confirmed that blockchain adoption intensity positively influences profitability when moderated by cybersecurity maturity and regulatory compliance.

METHODOLOGY

This study employed an explanatory research design to investigate the causal relationship between blockchain adoption and the financial performance of fintech companies in Nigeria. The population comprised 120 licensed fintech firms as identified by the Central Bank of Nigeria (CBN, 2024), from which ninety-two were selected using the Taro Yamane (1967) sample size determination formula. Both primary and secondary data sources were utilized. Primary data were obtained through a structured questionnaire measuring Blockchain Adoption Intensity (BAI), Regulatory Compliance Capability (RCC), and Cybersecurity Maturity (CSM) on a five-point Likert scale adapted from Li (2025) and Adesina and Balogun (2025). Secondary data were sourced from firms audited financial statements to capture key performance indicators such as Return on Assets (ROA), Return on Equity (ROE), and revenue growth for the period 2019–2024.

The study covered a six-year period to reflect the growing integration of blockchain within Nigeria's fintech ecosystem, generating a balanced panel dataset of 360 firm-year observations. Control variables such as firm size, age, leverage, and capital intensity were included to account for firm-specific characteristics. The reliability of the research instrument was confirmed through Cronbach's Alpha values ranging between 0.85 and 0.88, indicating high internal consistency in line with Nunnally (1978). Data were analyzed using panel regression techniques estimated with STATA 18 and SPSS 27. Both fixed-effects and random-effects models were estimated, and the Hausman test guided the selection of the fixed-effects model as the most appropriate specification. Robust standard errors were applied to correct for heteroscedasticity and serial correlation. The general model was expressed as:

$$FPit = \beta_0 + \beta_1 BAI_{it} + \beta_2 RCC_{it} + \beta_3 CSM_{it} + \beta_4 (BAI \times RCC) + \beta_5 (BAI \times CSM) + \gamma X_{it} + \mu_i + \lambda t + \varepsilon_{it}$$

where (FP) represents firm financial performance; (BAI), (RCC), and (CSM) are the main variables; (X) denotes control variables; and (μ_i) and (λt) represent firm-specific and time effects. This methodological approach provided a robust framework for understanding how blockchain adoption, compliance capability, and cybersecurity maturity jointly influence financial outcomes among Nigerian fintech firms.

RESULTS AND DISCUSSION OF FINDINGS

Table1: Descriptive Statistics of Variables (2019–2024)

Variable	Mean	Std. Dev.	Min	Max
Blockchain Adoption Intensity (BAI)	69.48	13.58	31.00	100.00
Regulatory Compliance Capability (RCC)	62.25	10.06	35.20	94.20
Cybersecurity Maturity (CSM)	59.89	10.22	29.70	88.90
Return on Assets (ROA)	0.032	0.011	0.005	0.067
Return on Equity (ROE)	0.049	0.024	–0.013	0.120
Net Profit Margin	0.175	0.051	0.034	0.316
Revenue Growth	0.134	0.112	–0.241	0.519
Leverage	0.450	0.144	0.050	0.809
Capital Intensity	0.186	0.088	0.010	0.392
Log Assets	9.65	0.61	8.23	11.26
Firm Age (years)	6.85	2.72	1.00	13.00

Source: Author's computation (2025).

Fintech firms in Nigeria show relatively high blockchain adoption (mean = 69.5 / 100) with improving compliance and cybersecurity capabilities. The average ROA (3.2%) and net margin (17.5%) indicate healthy profitability typical of growth-stage tech firms. Moderate leverage (0.45) and asset growth suggest a balanced capital structure.

Reliability and Validity

Table2: Cronbach's Alpha Reliability Test

Construct	Cronbach's α	Interpretation
Blockchain Adoption Intensity (BAI)	0.87	Excellent
Regulatory Compliance Capability (RCC)	0.85	Excellent
Cybersecurity Maturity (CSM)	0.88	Excellent

Threshold: $\alpha \geq 0.70$ indicates acceptable internal consistency (Nunnally, 1978).

The alpha values confirm high reliability, validating the internal consistency of the multi-item scales.

ISSN: 2992-3727 Published 30th November, 2025

Correlation Analysis

Table3: Pearson Correlation Matrix (Key Variables)

Variable	1	2	3	4	5	6	7	8	9	10	11
1 BAI Index	1										
2 RCC Index	.512**	1									
3 CSM Index	.472**	.486**	1								
4 ROA	.341**	.299**	.278**	1							
5 ROE	.354**	.310**	.265**	.811**	1						
6 Net Margin	.366**	.327**	.318**	.523**	.556**	1					
7 Revenue Growth	.401**	.359**	.345**	.287**	.301**	.336**	1				
8 Leverage	–.271*	–.243*	–.195	–.308**	–.315**	–.289**	–.266*	1			
9 Capital Intensity	–.188	–.165	–.143	–.276*	–.262*	–.249*	–.235*	.210*	1		
10 Log Assets	.354**	.337**	.296**	.420**	.394**	.351**	.372**	–.201	–.184	1	
11 Age	.229*	.203*	.185*	.312**	.288**	.277**	.261*	–.121	–.109	.188	1

Notes: p < 0.01 ()**; *p < 0.05* **Source:** Author's computation (2025).

Blockchain adoption (BAI) shows significant positive correlations with all measures of financial performance (ROA r = 0.34; Revenue Growth r = 0.40). Similarly, both RCC and CSM correlate positively with profitability and growth. The negative correlations of leverage and capital intensity with ROA align with finance theory, indicating that higher debt and capital costs reduce profitability.

Multicollinearity Test

Table4: Variance Inflation Factor (VIF) Results

Variable	VIF	Tolerance
BAI Index	2.31	0.43
RCC Index	2.76	0.36
CSM Index	2.52	0.40
Log Assets	1.92	0.52
Age	1.46	0.68
Leverage	1.37	0.73
Capital Intensity	1.22	0.82
Mean VIF	1.94	—

All VIF < 10 → no multicollinearity problem.

Regression Results

Three hierarchical models were estimated using firm- and year-fixed effects with cluster-robust standard errors (N = 360).

Table5: Fixed-Effects Regression Results (Dependent = ROA)

Variable	Model 1 (Base)	Model 2 (+ Interactions)
Constant	0.025 (3.02)**	0.024 (2.91)**
BAI Index (c)	0.010 (3.12)**	0.009 (2.98)**
RCC Index (c)	—	0.005 (2.17)*
CSM Index (c)	—	0.004 (1.78)*
BAI × RCC	—	0.006 (2.09)*
BAI × CSM	—	0.006 (2.25)*
Log Assets	0.004 (2.46)*	0.003 (2.14)*
Age	0.002 (1.92)*	0.002 (1.86)*
Leverage	–0.008 (–2.27)*	–0.007 (–2.18)*
Capital Intensity	–0.006 (–1.97)*	–0.005 (–1.88)*
Firm / Year FE	Yes	Yes
R^2 (Within)	0.325	0.336
Adj. R^2	0.168	0.170
N	360	360

*t-values in parentheses; **p < 0.01; *p < 0.05.*

BAI exhibits a strong positive impact on ROA (β = 0.010, p < 0.01). Both moderation terms are positive and significant, implying that firms with higher regulatory compliance and cybersecurity maturity experience greater profitability benefits from blockchain adoption.

Table6: Regression Results (Dependent = Revenue Growth)

Variable	Coefficient	t-stat
Constant	0.081	2.44*
BAI Index (c)	0.220	3.65**
RCC Index (c)	0.060	2.48*
CSM Index (c)	0.041	1.97*
BAI × RCC	0.062	2.33*
BAI × CSM	0.058	2.25*
Log Assets	0.040	2.61*
Age	0.012	1.88*
Leverage	–0.045	–2.22*
Capital Intensity	–0.033	–1.96*
R^2 (Within)	0.317	—
Adj. R^2	0.146	—
N	360	—

Blockchain adoption exerts a significant and positive influence on revenue growth (β = 0.22, p < 0.01). The positive and significant coefficients of BAI × RCC and BAI × CSM further demonstrate that compliance and cybersecurity maturity strengthen the growth effects of blockchain integration.

Discussion of Findings

The results from the descriptive, correlation, and regression analyses provide strong empirical support for the hypothesis that blockchain adoption significantly enhances the financial performance of fintech firms

in Nigeria. This finding aligns with the global consensus that blockchain technology represents a transformative innovation capable of reducing transaction costs, increasing transparency, and improving trust in digital financial ecosystems (Catalini & Gans, 2020; Wu, Zhu, & Wang, 2024).

Blockchain Adoption and Financial Performance

The positive and significant relationship between Blockchain Adoption Intensity (BAI) and both accounting-based (ROA) and market-based (Revenue Growth) measures of financial performance suggests that Nigerian fintechs integrating blockchain into their core operations gain measurable efficiency and profitability benefits. Specifically, firms with higher blockchain intensity recorded better return on assets, return on equity, and revenue growth, indicating that blockchain-driven process automation, real-time transaction settlement, and improved data reliability enhance cost efficiency and customer trust.

This result is consistent with Li (2025), who found that blockchain investments increased profitability among 250 emerging-market firms by improving asset utilization and reducing information asymmetry. Similarly, Wu et al. (2024) reported that Asian fintech firms using blockchain in payment processing and lending operations recorded higher ROA and Tobin's Q, validating the argument that blockchain-driven transparency and automation translate into better performance.

Within the Nigerian context, this finding supports Adelakun and Ogunyemi (2024), who demonstrated that blockchain adoption led to an average 8% increase in transaction volume and a 12% reduction in fraud-related losses among fintechs. The current result extends these findings by empirically confirming that blockchain adoption not only improves operational performance but also yields statistically significant improvements in profitability and growth metrics.

Moreover, the observed positive relationship reinforces the Resource-Based View (RBV), which posits that unique technological capabilities (such as blockchain infrastructure) can serve as a source of sustained competitive advantage when they are valuable, rare, inimitable, and non-substitutable (Barney, 1991). Blockchain provides fintech firms with such a capability by ensuring secure, tamper-resistant, and efficient transaction systems that competitors without similar infrastructure cannot easily replicate.

The evidence also resonates with the Transaction Cost Theory (Williamson, 1985), which argues that firms can improve efficiency by minimizing transaction and coordination costs. Blockchain achieves this by removing intermediaries, automating verification processes, and enhancing contractual execution through smart contracts. Thus, firms that intensify blockchain use enjoy reduced overhead and faster turnover, resulting in improved ROA.

Regulatory Compliance Capability as a Moderating Factor

The positive and significant moderating role of Regulatory Compliance Capability (RCC) reveals that blockchain's financial benefits are amplified in environments where firms possess strong compliance infrastructures. This finding reflects the importance of alignment between innovation and institutional frameworks. In Model 2, the interaction term (BAI × RCC) exhibited a positive and statistically significant coefficient ($\beta = 0.006$, $p < 0.05$), indicating that fintech firms that combine blockchain adoption with robust compliance systems experience superior financial performance compared to those with weak compliance practices. This finding corroborates the view of Ezeani and Nwokoma (2024), who noted that blockchain's effectiveness in Nigerian fintechs depends largely on the clarity and strength of regulatory oversight. Similarly, Abubakar and Mohammed (2023), in a comparative study of Nigeria, Ghana, and South Africa, found that fintechs operating under clearer regulatory environments gained more profitability from blockchain deployment.

Theoretically, this result can be explained using the Institutional Theory, which emphasizes the role of regulatory legitimacy in driving organizational performance (DiMaggio & Powell, 1983). Firms that align

their blockchain operations with existing financial and data protection regulations are more likely to attract investor confidence, avoid compliance penalties, and enjoy better market reputation all of which enhance financial outcomes. Empirically, the result supports Mutua (2023), who found that fintech firms in Kenya with higher compliance engagement and regulatory sandbox participation experienced greater stability and profitability after adopting blockchain. The Nigerian experience appears similar: firms leveraging blockchain while maintaining strong compliance with Central Bank of Nigeria (CBN) and Securities and Exchange Commission (SEC) frameworks outperform less compliant competitors. Thus, compliance capability acts as a strategic enabler that legitimizes innovation, mitigates regulatory risk, and sustains investor and customer trust key elements for long-term financial success.

Cybersecurity Maturity as a Moderating Factor

The results also confirm that Cybersecurity Maturity (CSM) significantly moderates the relationship between blockchain adoption and financial performance. The interaction term (BAI × CSM) was positive and significant ($\beta = 0.006$, $p < 0.05$), indicating that firms with more mature cybersecurity frameworks derive higher financial benefits from blockchain implementation. This finding is intuitively logical: although blockchain provides built-in cryptographic security, vulnerabilities often arise at peripheral layers such as APIs, wallets, and user interfaces necessitating comprehensive cybersecurity controls. Firms that invest in data protection, employee training, and intrusion detection systems thus maximize blockchain's performance benefits. This result aligns with Adesina and Balogun (2025), who established that Nigerian fintech companies with mature cybersecurity systems achieved stronger financial outcomes from blockchain and AI integrations due to reduced fraud incidents and better customer confidence. Similarly, Chen, Xu, and Liu (2021) found that Singaporean financial institutions improved profitability by 15% after integrating blockchain with strong cybersecurity and smart contract audit mechanisms.

From a theoretical lens, this outcome supports the Dynamic Capabilities Theory (Teece, 2018), which posits that organizations gain a competitive edge by integrating, building, and reconfiguring internal and external competencies to address rapidly changing environments. Cybersecurity maturity represents such a dynamic capability, allowing fintechs to safeguard their blockchain operations, manage digital risks effectively, and maintain operational resilience. In essence, blockchain adoption without adequate cybersecurity investment can expose firms to reputational and financial risks, as noted by Ghosh and Sharma (2023) in the case of Indian fintechs. However, when supported by robust cybersecurity infrastructure, blockchain's potential to improve financial performance becomes fully realized.

CONCLUSION

This study concludes that blockchain technology significantly improves the financial performance of fintech companies in Nigeria, particularly when firms integrate it with robust regulatory and cybersecurity practices. Blockchain's decentralization and immutability characteristics reduce transaction costs, mitigate fraud, and enhance data integrity, thereby improving profitability and operational efficiency. However, the financial impact of blockchain is not automatic. Its effectiveness is contingent on the institutional and organizational context within which it is adopted. Firms with strong regulatory compliance frameworks and cybersecurity maturity realize greater returns on blockchain investment. The findings affirm that technological innovation, when properly aligned with regulatory and governance systems, can serve as a major driver of financial inclusion, trust, and competitive advantage in Nigeria's rapidly evolving fintech landscape.

Furthermore, blockchain adoption must be viewed not merely as a technological upgrade but as a strategic transformation process that requires alignment between innovation, regulation, and digital risk management.

ISSN: 2992-3727 Published 30th November, 2025

RECOMMENDATIONS

Based on the empirical results and discussions, the following recommendations are made:

(1) For Fintech Companies

Integrate Blockchain Strategically: Fintech firms should embed blockchain within their core business processes such as payments, lending, KYC verification, and recordkeeping to enhance transparency, reduce transaction costs, and boost profitability. Strengthen Compliance Infrastructure: Firms should establish robust compliance departments, ensure adherence to CBN and SEC regulations, and engage actively in regulatory sandboxes. This will build legitimacy, attract investors, and ensure sustainable innovation. Invest in Cybersecurity Maturity: Continuous cybersecurity training, regular penetration testing, and ISO 27001 certification should be prioritized. This protects digital assets, reduces fraud risk, and sustains customer trust. Leverage Scale Economies: Larger fintech companies should exploit economies of scale to further expand blockchain-driven services, while smaller firms may collaborate through consortiums to share blockchain infrastructure costs.

(2) For Regulators and Policymakers

Establish Clear Blockchain Regulatory Frameworks: The CBN, SEC, and NITDA should develop unified and transparent guidelines for blockchain adoption to minimize uncertainty, promote innovation, and attract investment. Encourage Regulatory Sandboxes: The continuation and expansion of regulatory sandboxes will enable fintechs to test blockchain solutions under controlled conditions, fostering innovation while ensuring consumer protection. Promote Public–Private Partnerships: Collaborative initiatives between the government and private fintechs should focus on developing secure national blockchain infrastructures (e.g., for digital identity, payments, and SME finance). Incentivize Cybersecurity Compliance: Tax incentives or grants could be offered to fintechs investing in advanced cybersecurity frameworks, enhancing system resilience across Nigeria's digital finance ecosystem.

(3) For Investors and Industry Stakeholders

Adopt Blockchain Readiness as an Investment Metric: Investors should evaluate fintech firms' blockchain intensity, compliance culture, and cybersecurity maturity as predictors of financial resilience and long-term value.

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