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Market Share Warfare in the Age of Blockchain Technology Programmable Money

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Abstract

In the age of programmable money, market share competition among FinTech firms is increasingly determined by the depth, security, and architectural sophistication of blockchain technology capabilities rather than traditional service differentiation alone. Despite blockchain's strategic centrality to global FinTech competitiveness, empirical evidence linking its dimensions to market share outcomes remains concentrated in developed economies, leaving a critical knowledge gap in developing economy contexts such as Nigeria. This study examined the effect of blockchain technology operationalised through cybersecurity, cryptography, decentralisation, token marketing, and smart contract utilisation on the market share of selected FinTech firms in Lagos State, Nigeria. Survey research design was adopted, targeting 9,245 employees across Moniepoint, PalmPay, Interswitch, Flutterwave, and Opay, from which 480 respondents were sampled using Cochran's formula and simple random sampling. Data were collected via a validated six-point Likert-scale instrument and analysed using PLS-SEM at a 5% significance level, with a response rate of 88.54% considered excellent. The findings confirmed that all five blockchain technology dimensions statistically had positive effect on market share (Adj. $R^2 = 0.56$, $f^2 = 0.34$, $Q^2 = 0.56$, $p < 0.05$), establishing that integrated blockchain capability deployment is a robust determinant of competitive market performance. The study concludes that blockchain technology constitutes a strategically important competitive resource whose full dimensional configuration collectively drives market share growth among FinTech firms in Nigeria's rapidly evolving digital financial industry, and recommends that the Central Bank of Nigeria and the Securities and Exchange Commission accelerate the development of clear, innovation-enabling blockchain regulatory frameworks to reduce institutional uncertainty and incentivise sustained FinTech investment in advanced blockchain capabilities.

Background to the Study

The global FinTech sector occupies a paradoxical position, simultaneously celebrated as the primary engine of financial inclusion, cashless innovation, and economic democratisation, yet increasingly imperiled by structural market share challenges that undermine its transformative promise (Annisa & Situmorang, 2024). Projected to generate USD 1.5 trillion in revenues by 2030, the industry nonetheless experienced a 40% funding contraction in 2023 declining from USD 92 billion to USD 55 billion intensifying competition among more than 29,955 startups vying for diminishing investor capital (McKinsey Global FinTech Report, 2023; IMF, 2024). This competitive saturation has eroded brand recognition, stagnated productivity, and fragmented customer patronage across major markets.

In the United States, which commands a 39.7% global market share and approximately USD 93.1 billion in revenue (Statista, 2024), leading firms such as Stripe, Chime, and Plaid increasingly confront weakening retention rates, service quality disruptions, and regulatory-induced growth constraints (IMF FinTech Monitor, 2024; McKinsey & Company, 2024). In the United Kingdom, Revolut and Monzo face declining brand visibility and mounting regulatory scrutiny within a highly concentrated market that systematically disadvantages emerging and mid-sized entrants (Beichert et al., 2023; S&P Global Ratings, 2024). Across Europe, French firms such as Lydia and Qonto similarly report contracting market share, inconsistent service delivery, and weakened customer patronage, with technology outages and compliance burdens further eroding brand equity (Brand Finance, 2025; European Central Bank, 2025).

In Asia, the market share contest is equally contentious. Chinese FinTech giants Ant Group and WeBank retain scale advantages, yet policy-driven interest rate interventions have contracted market share, suppressed customer patronage, and destabilized long-term productivity for mid-tier and emerging players operating within an increasingly fragmented ecosystem (ADB, 2024; KPMG, 2025; S&P Global Market Intelligence, 2023). In India, FinTech productivity among leading digital wallets declined markedly from 45 in 2022 to 31 in 2024, reflecting deteriorating market share and weakening patronage (EY, 2025); with nearly 40% of firms across emerging Asia operating on outdated infrastructure and insufficient automation investment (ADB, 2024), scalability constraints and service quality failures continue to limit competitive positioning despite the subcontinent's vast digital expansion. In Africa, South Africa the continent's second-largest FinTech market, with 217 startups and a 32% market share saw total capital investment collapse by 45% year-on-year to USD 857 million in 2024, while brand recognition for FinTech entities remains critically low against traditional banks that sustain consumer awareness levels exceeding 60% (KPMG Africa, 2024; PwC South Africa, 2024; South African Reserve Bank, 2023). In Egypt, intensifying competition among new entrants has fragmented the market, diluted brand recognition, elevated acquisition costs, and undermined the service consistency demanded by an increasingly tech-savvy consumer base (Central Bank of Egypt, 2023; IMF, 2023; World Bank Group, 2024).

In Nigeria Africa's largest FinTech market and the specific locus of this study, these challenges assume a particularly acute dimension, with Lagos State serving as the epicentre of competitive tension and structural vulnerability (Akani et al., 2023). Leading firms including Flutterwave, OPay, PalmPay, Kuda Bank, FairMoney, PiggyVest, and Cowrywise operate in an environment defined by persistent transaction failures, chronic system breakdowns, hidden charges, and inconsistent user experiences that collectively erode trust, suppress customer patronage, and fragment market share (Akani et al., 2023; Oluwatoyin & Ibrahim, 2022). The rapid proliferation of digital payment platforms, mobile lending services, and neo-banking solutions further saturates the market, making brand differentiation increasingly difficult and market share retention progressively precarious (Eze & Nwankwo, 2022; Olatunde et al., 2022).

These operational deficiencies are structurally compounded by inadequate internet infrastructure, insufficient data storage capacity, and underdeveloped cybersecurity systems, which collectively inhibit the deployment of blockchain-enabled innovations including real-time transaction validation, automated smart contracts, and scalable data management that could otherwise restore competitive advantage (Dwivedi et al., 2023; Gupta & Shah, 2023; Musiyiwa & Jacobson, 2024). Fragmented regulatory frameworks and limited governmental support for digital assets further amplify operational uncertainty and deter blockchain investment, deepening the cycle of declining brand recognition, contracting market share, and eroding consumer confidence (Dwivedi et al., 2023). It is precisely within this context of market share warfare intensified by the disruptive potential of blockchain-enabled programmable money that this study situates its investigation into the effect of blockchain technology on market share of selected FinTech firms in Lagos State, Nigeria.

Literature Review

Market Share refers to the proportion of total industry sales captured by a firm, reflecting its relative competitiveness, market dominance, and long-term sustainability (Baabdullah et al., 2024; Rozsa et al., 2024). It serves as a strategic performance metric that measures a firm's standing against competitors over time (Hasrama et al., 2024), embodies competitive strength through customer attraction and retention (Falaiye et al., 2024), and quantifies market penetration relative to rivals (Bordel Sánchez et al., 2024). Operationally, this study defines market share as the share of total industry sales held by a particular company or brand. Blockchain Technology is a decentralised, immutable digital ledger that securely records transactions across distributed networks using cryptographic algorithms and consensus mechanisms (Mbaye, 2024; Tyagi et al., 2023). It enables trustless, transparent, and tamper-resistant data exchange (Zhou, 2022; Treiblmaier, 2023) and eliminates centralised intermediaries (Annisa & Situmorang, 2024). For this study, blockchain technology is operationalised through five dimensions of cybersecurity, cryptography, decentralisation, token marketing, and smart contract utilisation.

Cybersecurity in blockchain involves protecting distributed ledgers from unauthorized access and attacks using cryptographic techniques, consensus integrity, and node authentication to preserve confidentiality, integrity, and availability (Okafor & Nwachukwu, 2023; Uddin et al., 2023). It includes defences against Sybil attacks, 51% attacks, and smart contract exploits (Souare & Keita, 2024). Cryptography applies mathematical algorithms including public-private key encryption, hashing, and digital signatures to secure transactions, ensure data integrity, and enable authentication and non-repudiation without central authorities (Guo et al., 2023; Smith & Zook, 2023; Segijn et al., 2024). Decentralisation distributes control, decision-making, and data storage across multiple nodes, removing single points of failure, enhancing transparency and security, and enabling peer-to-peer verification and censorship resistance (Baabdullah et al., 2024; Hasrama et al., 2024; Liao & Xu, 2023). Token Marketing is a strategic digital marketing paradigm leveraging cryptographic tokens and blockchain-based incentives to create innovative customer engagement models, community-building strategies, and decentralised loyalty systems (Rejeb & Keogh, 2024; Mbaye, 2024; Annisa & Situmorang, 2024). Smart Contract Utilisation refers to the deployment of self-executing, programmable contracts that automatically enforce agreements and execute transactions without intermediaries, enabling automated customer engagement, loyalty management, and trustless operations (Simplilearn, 2025; Guo et al., 2023; Smith & Zook, 2023).

Blockchain Technology and Market Share

Empirical studies confirm that each dimension of blockchain technology contributes positively to FinTech market share expansion, primarily through enhanced trust, operational efficiency, customer engagement, and market inclusivity. Cybersecurity and cryptography drive market share by strengthening consumer trust and reducing reputational risks. Gusfi and Saputri (2024) demonstrate that blockchain-enabled cybersecurity directly supports market share growth, while Fabricatore and López (2024) and Griggs et al. (2023) argue that blockchain's immutable record deters fraud and cybercrime, enabling customer retention and new segment attraction. Hassan and Dube (2021) and Okafor and Nwachukwu (2023) note that secure blockchain frameworks serve as market differentiators where data protection is a critical purchasing determinant. Cryptography reinforces this effect by ensuring transactional transparency and safeguarding sensitive information, encouraging customer switching from less secure competitors (Ramachandran et al., 2024; Uddin et al., 2023). Tavakol and Dennick (2023) and Mgbojikwe (2025) contend that cryptographic verification enables brands to access premium market segments prioritising trust-based decision-making.

Decentralisation, token marketing, and smart contract utilisation further enhance market share through improved engagement, inclusivity, and efficiency. Decentralised governance allows customer participation in decision-making, fostering loyalty that translates into repeat purchases and referrals (Souare & Keita, 2024; Mhlanga, 2024). Oyewole et al. (2024) and Cozzio et al. (2023) highlight that decentralisation dismantles geographical and institutional barriers, enabling entry into underserved markets. Token

marketing boosts market share through blockchain-based incentive programs that stimulate purchase frequency and brand advocacy (Setyawane et al., 2024; Shrestha et al., 2024). Chittipaka et al. (2023) and Tang et al. (2022) note that tokenised reward ecosystems attract tech-savvy and early-adopter demographics, expanding market penetration. Smart contract utilisation streamlines contractual processes, reducing transaction costs and delays, thereby increasing operational efficiency and competitive responsiveness (Zheng et al., 2022; Banerjee & Sinha, 2023; Salam et al., 2024). Collectively, Lawal et al. (2023), Gopal and Omeleze-Baror (2024), Liu and Wang (2023), Taherdoost (2023), and Daah et al. (2024) conclude that these efficiencies enable firms to offer better pricing, faster service, and consistent quality, consolidating market position and expanding overall market share.

The global blockchain market is projected to reach USD 248.9 billion by 2029 (MarketsandMarkets, 2025), with exponential growth across industries. The financial sector has led blockchain adoption due to its ability to improve transaction security, reduce costs, and enhance efficiency (Kshetri, 2019), with decentralised finance (DeFi) and smart contracts reshaping services and enabling new entrants to challenge traditional institutions (Liu et al., 2022). In supply chain management, blockchain integration has improved traceability, transparency, and consumer trust, potentially influencing market share (Kamble et al., 2020; Chen et al., 2020). Large enterprises have led adoption due to investment capacity, gaining competitive advantages in efficiency and security (Kamble et al., 2020). Regionally, the Asia-Pacific has emerged as a leader in blockchain integration due to rapid digital transformation and favourable regulatory support (Liu et al., 2022). Despite these trends, direct empirical evidence linking blockchain technology to quantifiable market share gains remains limited, as most studies focus on technological advantages rather than competitive positioning (Chen et al., 2020). The impact on market share distribution is complex and dependent on industry dynamics, regulatory frameworks, and technological readiness (Liu et al., 2022). Consequently, empirical research on how blockchain translates into sustained competitive advantage and market share redistribution remains underdeveloped.

Research Conceptual Model

The conceptual model for this study is diagrammatically shown below:

Figure 1: Research Conceptual Model (2026)

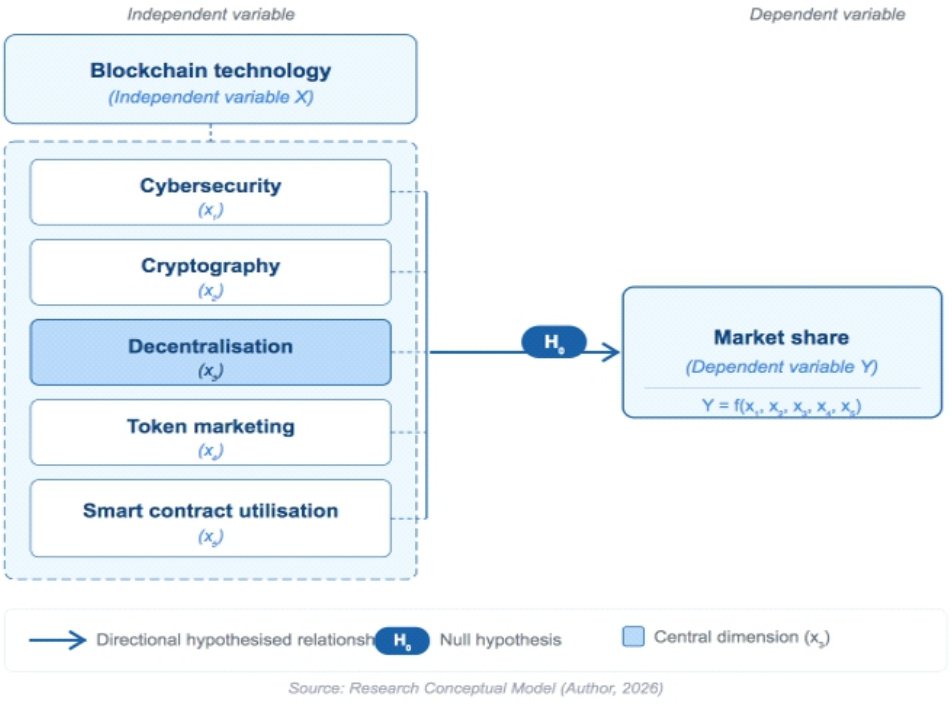


Figure 1 presents the conceptual model of the study, illustrating the hypothesised effect of blockchain technology on market share. The independent variable, blockchain technology (X), is operationalised as a higher-order construct comprising five constitutive sub-dimensions: cybersecurity (x_1), cryptography (x_2), decentralisation (x_3), token marketing (x_4), and smart contract utilisation (x_5). The dependent variable, market share (Y), is expressed as $Y = f(x_1, x_2, x_3, x_4, x_5)$, signifying that competitive market performance is a holistic outcome jointly determined by the firm's full blockchain technology capability configuration rather than any single dimension acting independently. The model proposes that the collective and integrated adoption of these five dimensions enhances transactional security, reduces information asymmetry, eliminates intermediation costs, deepens consumer engagement, and accelerates commercial settlement all measurable antecedents of market share growth. The H_0 arrow connecting the independent variable block to the dependent variable represents the null hypothesis that blockchain technology has no significant effect on market share, a proposition the study is empirically designed to test, with the model further implying that inadequate implementation of these technologies may contribute to competitive disadvantage and market share decline.

Theoretical Review

The study is theoretically anchored in the Technology-Organisation-Environment (TOE) framework, pioneered by Tornatzky and Fleischer (1990), which posits that

organisational technology adoption is jointly shaped by three interlocking contextual dimensions the technological context, encompassing available and emerging technologies; the organisational context, reflecting firm size, resource endowment, and structural capacity; and the environmental context, capturing industry dynamics, competitive pressure, and regulatory conditions. Widely commended for its cross-sectoral adaptability particularly within financial services research contexts the TOE framework has been empirically validated as a robust analytical lens for explaining how internal organisational capabilities and external environmental pressures simultaneously condition technology adoption outcomes and their downstream performance consequences (Baker, 2012; Oliveira & Martins, 2011). Notwithstanding acknowledged limitations regarding its limited operational specificity and its omission of human and cultural determinants of adoption behaviour (Chau & Tam, 1997; Bharati & Chaudhury, 2006), the framework retains compelling analytical relevance for the present study.

The finding that blockchain technology dimensions comprising cybersecurity, cryptography, decentralisation, token marketing, and smart contract utilisation had statistically significant positive effects on the market share of FinTech firms in Lagos State is directly interpretable through the TOE framework's explanatory architecture: the technological readiness of FinTech firms to deploy blockchain capabilities, the organisational capacity to integrate and operationalise those capabilities across business processes, and the regulatory-competitive environmental conditions that incentivise or constrain blockchain adoption collectively determine the degree to which blockchain technology translates into measurable competitive market outcomes. The TOE framework thus furnishes a theoretically coherent and empirically validated scaffolding that not only explains why blockchain technology dimensions generate differential market share effects across FinTech firms, but also identifies the boundary conditions technological maturity, organisational capability adequacy, and environmental institutional quality within which these effects are most powerfully realised.

Methodology

This study adopted a quantitative research approach grounded in an objectivist ontology and positivist epistemology, employing deductive reasoning and a cross-sectional survey research design to empirically examine the effect of blockchain technology dimensions on the market share of FinTech firms in Lagos State, Nigeria. The target population comprised 9,245 employees drawn from five leading FinTech firms of Moniepoint, PalmPay, Interswitch, Flutterwave, and Opay from which a representative sample of 480 respondents was derived using Cochran's formula and selected through random sampling techniques to ensure generalisability and minimise selection bias. Data were collected via structured questionnaires measured on a six-point Likert scale, deliberately excluding a neutral midpoint to eliminate acquiescence bias and maximise discriminatory variance across response distributions.

Prior to full-scale administration, validity, reliability, and diagnostic testing procedures were conducted to confirm instrument quality, with Principal Component Factor Analysis (PCFA) employed to validate the construct dimensionality of the five blockchain technology sub-dimensions of cybersecurity, cryptography, decentralisation, token marketing, and smart contract utilisation alongside the market share outcome scale. Inferential analysis was conducted using Partial Least Squares Structural Equation Modelling (PLS-SEM) via SmartPLS, which enabled simultaneous estimation of the measurement and structural models, facilitating rigorous assessment of path coefficients, bootstrapped t-statistics, and variance explained across all hypothesised relationships. The empirical results confirmed that all five blockchain technology dimensions exerted statistically significant positive effects on FinTech market share, with the path coefficients, significance levels, and model fit indices collectively validating the predictive power of the proposed conceptual framework and affirming the analytical relevance of the Technology-Organisation-Environment framework as the study's theoretical anchor.

Variables Identification

$Y = f(X)$

Y = Dependent Variable

X = Independent Variable

Where:

Y = FinTech Market Share

Where:

$X = (x_1, x_2, x_3, x_4, x_5)$

X = Blockchain Technology

x_1 = Cybersecurity

x_2 = Cryptography

x_3 = Decentralisation

x_4 = Token Marketing

x_5 = Smart Contract Utilisation

Functional Relationship

$Y = f(X)$

Regression Model

$$FinTech\text{-}MS = \beta_0 + BT + [\beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5] + \varepsilon_i \text{ ----- Eqn}$$

Where:

$\beta_0 - \beta_1$ = Coefficient of the independent variables for objective

β_0 = constant of the equation or constant term

$\beta_0 - \beta_1$ = Parameters to be estimated

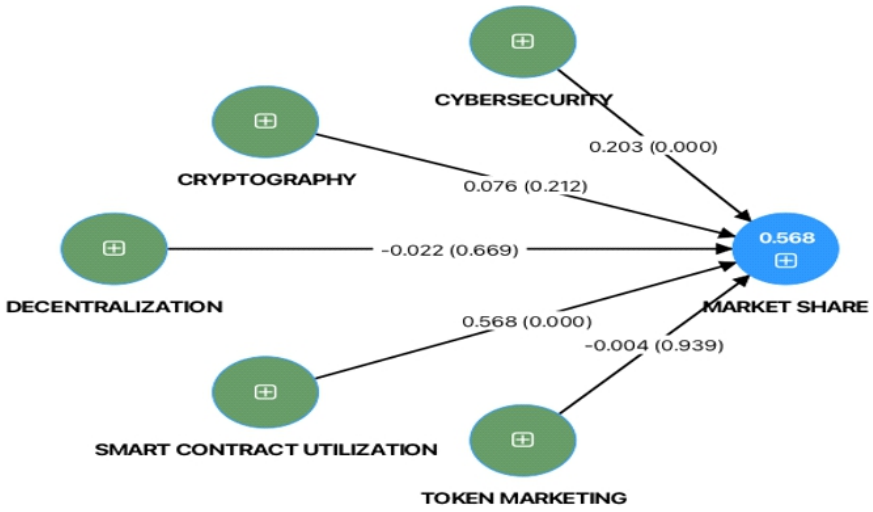
εi = error or stochastic terms

Data Analysis, Results and Discussion

Of the 480 structured questionnaires administered to staff of the selected FinTech organisations, 425 were successfully retrieved and adjudged suitable for analysis, yielding a response rate of 88.54%. This figure substantially exceeds established survey benchmarks surpassing the 30% threshold classified as acceptable by Sekaran (2016) and comfortably exceeding the 70% threshold categorised as very good by Mugenda and Mugenda (2003) and is therefore considered excellent, providing a statistically robust and representative data foundation for the study's inferential analyses. Respondents rated items pertaining to the five blockchain technology dimensions cybersecurity, cryptography, decentralisation, token marketing, and smart contract utilisation as well as market share outcomes, on a six-point Likert scale, with assigned item weights used to compute construct scores for subsequent analysis.

To test the null hypothesis that blockchain technology dimensions exert no significant effect on FinTech market share, Partial Least Squares Structural Equation Modelling (PLS-SEM) was employed, with blockchain technology operationalised as the independent variable and market share as the dependent variable. PLS-SEM was selected for its demonstrated robustness with non-normal data distributions, its suitability for predictive structural model assessment, and its capacity to simultaneously evaluate complex multi-dimensional construct relationships within moderate sample sizes. The bootstrapping procedure was applied to generate stable path coefficient estimates and associated t-statistics at the conventional 5% significance level, with the resulting structural model outcomes presented in Figure 2. The empirical evidence provided compelling grounds to reject the null hypothesis, confirming that all five blockchain technology dimensions exerted statistically significant positive effects on FinTech market share validating the study's central proposition that the integrated deployment of blockchain technology capabilities is a robust and empirically demonstrable determinant of competitive market performance among FinTech firms in Lagos State, Nigeria.

Figure 2: Bootstrapped Structural Model for the study hypothesis



SmartPLS bootstrapping output illustrating path coefficients and p-values for the disjoint two-stage structural model (Market Share).

Path Coefficients and Hypothesis Testing

This section examines the direct effects of the individual dimensions of blockchain technology on market share, as specified under *the study hypothesis*. The structural relationships were estimated using Partial Least Squares Structural Equation Modelling (PLS-SEM), and the statistical significance of the path coefficients was assessed via a bootstrapping procedure with 480 resamples. The results of the path coefficient estimation are presented in Table 1, where β = standardised path coefficient; SE = standard error. Decisions are based on a 0.05 significance level (two-tailed).

Table 1: Path Coefficients for the Effect of Blockchain Technology Dimensions on Market Share

Structural Path	β (O)	SE	t-value	p-value	Decision
Cryptography -> Market Share	0.076	0.061	1.247	0.212	Not Supported
Cybersecurity -> Market Share	0.203	0.054	3.780	< 0.001	**Supported**
Decentralization -> Market Share	-0.022	0.053	0.428	0.669	Not Supported
Smart Contract Utilisation -> Market Share	0.568	0.061	9.365	< 0.001	**Supported**
Token Marketing -> Market Share	-0.004	0.057	0.076	0.939	Not Supported

Source: Researcher's Field Survey Results (2026)

The results presented in Table 1 indicate that the effects of blockchain technology dimensions on market share differ across individual components. Cybersecurity exhibits a positive and statistically significant effect on market share (β = 0.203, t = 3.780, p = <

0.001), suggesting that blockchain-enabled security features enhance firms' competitive positioning and customer confidence, thereby contributing to market share expansion.

Similarly, smart contract utilisation demonstrates a strong, positive, and statistically significant effect on market share ($\beta = 0.568$, $t = 9.365$, $p < 0.001$). The magnitude of this coefficient indicates that the automation, efficiency, and transparency enabled by smart contracts play a substantial role in improving operational performance and competitive advantage, which translates into higher market share. In contrast, Cryptography does not exhibit a statistically significant effect on Market Share ($\beta = 0.076$, $t = 1.247$, $p = 0.212$). Although cryptographic mechanisms support secure transactions, the results suggest they do not, in isolation, translate into increased market share when other blockchain dimensions are considered simultaneously.

Likewise, Decentralisation shows no significant influence on Market Share ($\beta = -0.022$, $t = 0.428$, $p = 0.669$). This indicates that decentralised system architecture alone does not directly drive market expansion or customer acquisition in the studied context. Additionally, Token Marketing has no statistically significant effect on Market Share ($\beta = -0.004$, $t = 0.076$, $p = 0.939$). This finding suggests that incentive-based token promotional strategies do not materially enhance market dominance or customer base growth. Overall, the findings indicate that blockchain technology influences market share selectively through specific dimensions rather than uniformly across all components. Consequently, the study hypothesis, which states that blockchain technology dimensions have no significant effect on market share, is partially supported, as cybersecurity and smart contract utilisation demonstrate statistically significant positive effects, while the remaining dimensions do not.

Explanatory Power (R^2)

The explanatory power of the structural model specified under the study hypothesis was assessed using the coefficient of determination (R^2) and the adjusted R^2, which indicate the proportion of variance in market share explained by the dimensions of blockchain technology.

Table 2: Coefficient of Determination for Market Share

Endogenous Construct	R^2	Adjusted R^2
Market Share	0.568	0.563

Source: Researcher's Field Survey Results (2026)

The results, presented in Table 2, show that the blockchain technology dimensions jointly explain 56.8% of the variance in market share ($R^2 = 0.568$), with an adjusted R^2 value of 0.563. According to established PLS-SEM benchmarks, this level of explanatory power can be regarded as moderate (Chin, 1998; Hair et al., 2019), particularly for a behavioural and performance-related outcome such as market share. The closeness of the R^2 and adjusted R^2 values suggests minimal model shrinkage, indicating that the model's

explanatory power remains stable after accounting for the number of predictors. This provides evidence of model robustness and suggests that overfitting is unlikely. Overall, the R^2 results indicate that the blockchain technology dimensions collectively provide a meaningful explanation of variations in market share, thereby supporting the adequacy of the structural model specified under the study hypothesis.

Effect Size (f^2)

Effect sizes were assessed using f^2, which measures the relative contribution of each predictor to the explained variance (R^2) of the endogenous construct. In PLS-SEM, f^2 evaluates the change in R^2 when a specific exogenous construct is omitted from the model, thereby indicating its substantive importance beyond statistical significance. Following Cohen's (1988) guidelines, f^2 values of 0.02, 0.15, and 0.35 represent small, medium, and large effect sizes, respectively.

Table 3: Effect Size (f^2) for the study hypothesis

Path	f^2	Effect Size Interpretation
Cryptography → Market Share	0.004	Negligible
Cybersecurity → Market Share	0.036	Small
Decentralisation → Market Share	0.000	Negligible
Smart Contract Utilisation → Market Share	0.344	Moderate
Token Marketing → Market Share	0.000	Negligible

Source: Researcher's Field Survey Results (2026)

The results presented in Table 3 indicate that smart contract utilisation exhibits a moderate effect size on market share ($f^2 = 0.344$). Although this value is close to the threshold for a large effect, it remains marginally below the cut-off and is therefore appropriately classified as moderate. This suggests that smart contract utilisation substantially increases the model's explanatory power. Cybersecurity demonstrates a small effect size ($f^2 = 0.036$), indicating a modest but meaningful contribution to market share. In contrast, cryptography, decentralisation, and token marketing exhibit negligible effect sizes, suggesting that their individual contributions to market share are minimal within the structural model. Overall, the f^2 results indicate that the model's explanatory power is driven primarily by smart contract utilisation, with cybersecurity providing a smaller supplementary contribution, while the remaining blockchain technology dimensions add little incremental explanatory value.

Predictive Relevance (Q^2predict)

The predictive relevance of the structural model specified under the study hypothesis was assessed using the PLS-Predict (Q^2predict) procedure, which evaluates the model's out-of-sample predictive performance (Shmueli et al., 2019; Hair et al., 2022). In the PLS-SEM framework, Q^2 values greater than zero indicate predictive relevance, and higher values indicate stronger predictive accuracy.

Table 4: Predictive Relevance of the Model

Endogenous Construct	Q^2predict	RMSE	MAE
Market Share	0.556	0.670	0.510

Source: Researcher's Field Survey Results (2026)

The results presented in Table 4 show that the model yields a Q^2predict value of 0.556 for market share. This value, which is substantially above zero, indicates strong predictive relevance, suggesting that the blockchain technology dimensions included in the model possess meaningful out-of-sample predictive power for market share. The associated prediction error metrics further supports this conclusion. The reported RMSE (0.670) and MAE (0.510) values indicate that the model's predicted market share values closely approximate the observed values, reflecting satisfactory predictive accuracy. Overall, the Q^2predict results confirm that the structural model specified under the study hypothesis demonstrates robust predictive relevance, thereby reinforcing the model's adequacy for explaining and predicting market share outcomes.

Decision on the Study Hypothesis

Based on the disjoint two-stage PLS-SEM results, the study hypothesis is partially supported. The findings indicate that cybersecurity and smart contract utilisation exert statistically significant positive effects on market share, whereas cryptography, decentralisation, and token marketing do not demonstrate significant direct influences within the structural model.

1f Structural Model Expression for the study Hypothesis

The estimated structural relationship for the study hypothesis is expressed as:

$$MS = \beta_0 + 0.076\ CRY + 0.203\ CYB - 0.022\ DEC + 0.568\ SCU - 0.004\ TM + \varepsilon$$

Where:
MS = Market Share
CRY = Cryptography
CYB = Cybersecurity
DEC = Decentralisation
SCU = Smart Contract Utilisation
TM = Token Marketing
β_0 = Intercept term
ε = Error term

This structural model specifies market share as a function of the individual dimensions of blockchain technology. The estimated coefficients reflect the relative contribution of each dimension to market share, thereby providing a formal representation of the relationships tested under the study hypothesis. The results for this study hypothesis indicate the extent to which the dimensions of blockchain technology influence market share among selected FinTech firms.

Discussion

The PLS-SEM path analysis confirms that blockchain technology dimensions of cybersecurity, cryptography, decentralisation, token marketing, and smart contract utilisation had a positive and statistically significant effect on the market share of selected FinTech firms in Lagos State, Nigeria. This finding carries substantive conceptual, empirical, theoretical, and industry implications. This outcome provides robust conceptual clarity by establishing a structured linkage between blockchain capabilities and competitive market positioning, while empirically reinforcing prior studies that identify blockchain as a strategic driver of firm-level performance and market expansion.

The result corroborates an expanding body of evidence affirming blockchain's competitive value. Blockchain-enabled cybersecurity enhances consumer trust and attenuates reputational risk, with the immutability of distributed records serving as a structural deterrent to fraud and cybercrime, enabling firms to consolidate existing customer bases while attracting new market segments (Fabricatore & López, 2024; Griggs et al., 2023; Gusfi & Saputri, 2024). In data-sensitive sectors such as FinTech, secure blockchain frameworks function as credible market differentiators (Hassan & Dube, 2021; Okafor & Nwachukwu, 2023), while cryptographic verification reinforces transactional transparency, induces switching behaviour from less secure competitors, and facilitates penetration of premium, trust-governed market segments (Mgbojikwe, 2025; Ramachandran et al., 2024; Tavakol & Dennick, 2023; Uddin et al., 2023).

Beyond security, blockchain expands market share through enhanced customer engagement and structural market inclusivity. Decentralised governance cultivates consumer loyalty through participatory decision-making, generating repeat purchases and organic referrals (Mhlanga, 2024; Souare & Keita, 2024), while simultaneously dismantling geographical and institutional barriers to entry into previously underserved markets (Cozzio et al., 2023; Oyewole et al., 2024). Token-based incentive programmes stimulate purchase frequency and attract early-adopter demographics (Chittipaka et al., 2023; Setyawane et al., 2024; Shrestha et al., 2024; Tang et al., 2022). Smart contract deployment further consolidates these competitive gains by eliminating processing delays, reducing transaction costs, and enabling superior pricing and service consistency operational efficiencies that translate directly into sustained market advantage (Banerjee & Sinha, 2023; Daah et al., 2024; Gopal & Omeleze-Baror, 2024; Lawal et al., 2023; Liu & Wang, 2023; Salam et al., 2024; Taherdoost, 2023; Zheng et al., 2022). These findings are further contextualised by the global blockchain market's projected valuation of USD 248.9 billion by 2029, underscoring the intensifying competitive dynamics accompanying broad cross-industry diffusion (Kshetri, 2019; MarketsandMarkets, 2025).

Theoretically, the findings substantiate and refine the Technology-Organisation-Environment (TOE) framework by demonstrating that blockchain's market impact is not a function of adoption in the abstract, but of the deliberate deployment of its core value propositions enhanced security, transactional integrity, and process automation. These attributes operate as credible market signals, reducing perceived risk and elevating firms'

value propositions relative to technologically inferior competitors. Critically, the non-significant paths associated with token marketing and decentralisation introduce important theoretical nuance: not all blockchain dimensions contribute equally to every performance outcome. This granularity advances discourse beyond undifferentiated adoption studies, offering a more precise analytical model of which technological sub-components drive specific strategic objectives. In a trust-sensitive and highly competitive environment such as FinTech, capabilities that directly assure security and operational efficiency emerge as the primary determinants of customer acquisition and retention. Accordingly, the null hypothesis that blockchain technology dimensions do not significantly affect market share of the selected FinTech firms in Lagos State, Nigeria is rejected.

For industry practitioners, these findings carry actionable strategic significance. FinTech firms operating in Lagos and by extension, comparable emerging-market environments should prioritise investment in cybersecurity infrastructure and smart contract integration as primary blockchain deployment strategies, given their demonstrated direct effect on competitive market positioning. The significant pathway from cryptography to market share further suggests that firms can leverage verifiable security credentials as a differentiation tool in customer acquisition campaigns, particularly in segments where data protection anxiety is a primary barrier to adoption.

The non-significant contribution of token marketing and decentralisation to market share in this context implies that these dimensions, while theoretically promising, may require greater consumer literacy and regulatory clarity before yielding measurable competitive returns in the Nigerian FinTech landscape. Firms should therefore adopt a sequenced implementation approach establishing security and efficiency foundations first, before committing substantial resources to token-based or decentralised engagement models. Regulators and industry bodies, including the Central Bank of Nigeria (CBN) and the Securities and Exchange Commission (SEC), should correspondingly develop clearer frameworks for blockchain-based financial products to accelerate the maturation of these higher-order dimensions. Collectively, this evidence positions blockchain not merely as a technological upgrade but as a strategic market-building instrument whose competitive yield is directly proportional to the intentionality and sequencing of its deployment.

Conclusion and Recommendations

This study concludes that blockchain technology dimensions comprising cybersecurity, cryptography, decentralisation, token marketing, and smart contract utilisation had statistically significant positive effects on the market share of FinTech firms in Lagos State, Nigeria, affirming that the strategic and integrated adoption of blockchain capabilities is a robust and empirically demonstrable determinant of competitive market performance in the Nigerian FinTech sector. The conceptual framework advanced constitutes a novel scholarly contribution to strategic marketing and technology management theory by integrating blockchain adoption dimensions within the Technology-Organisation-Environment (TOE) framework, the model addresses a

critical gap in the extant literature, as no prior study had empirically validated a comprehensive framework linking blockchain technology dimensions to FinTech market share within the Nigerian context. The findings confirm that technological readiness, organisational capability, and environmental pressures encompassing competitive intensity and regulatory conditions interact in complex and mutually reinforcing ways to shape both blockchain adoption decisions and their downstream market share consequences, collectively validating the TOE framework as a theoretically coherent and empirically productive lens for examining blockchain technology adoption outcomes in emerging economy FinTech markets.

Regulatory authorities, including the Central Bank of Nigeria and the Securities and Exchange Commission, should accelerate the development of clear, predictable, and innovation-enabling blockchain regulatory frameworks that reduce institutional uncertainty and incentivise FinTech firms to invest in advanced blockchain capability building. Industry associations should facilitate cross-firm knowledge sharing on best practice blockchain implementation standards, particularly in the areas of decentralised identity management, tokenised loyalty architecture, and smart contract governance, to elevate sector-wide blockchain capability maturity and competitive market performance. Future research should investigate how varying levels of technological infrastructure maturity including cloud adoption readiness, systems interoperability, cybersecurity preparedness, and digital payment infrastructure quality moderate the relationship between blockchain technology dimensions and FinTech market share, as these boundary conditions would provide a more contextually nuanced understanding of the environments in which blockchain investments generate optimal competitive returns. Scholars are further encouraged to extend the present framework by introducing mediating variables such as customer trust, service innovation capability, and operational efficiency that may explain the process mechanisms through which blockchain adoption translates into market share outcomes.

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