

# CRYPTOCURRENCY MARKET DYNAMICS AND FINANCIAL PERFORMANCE OF DEPOSIT MONEY BANKS IN NIGERIA

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## ARTICLE INFO

**Article No.:** 0196

**Accepted Date:** 03/02/2026

**Published Date:** 05/03/2026

**Type:** Research

## ABSTRACT

This study examined the effect of cryptocurrency market indicators on the financial performance of deposit money banks in Nigeria. Specifically, the study investigated the influence of Bitcoin, Ethereum, Binance Coin, and Ripple on profitability measured by Return on Assets (ROA). An ex-post facto research design was adopted, utilizing secondary data obtained from the published annual financial reports of selected deposit money banks. The dataset comprised annual panel data covering the period 2013 to 2022. Given the continuous nature of the dependent variable (ROA), panel data regression techniques, including fixed effects and random effects models were employed for hypothesis testing. The empirical results revealed that Bitcoin exerts a negative and statistically significant effect on ROA ( $\beta = -35.1002$ ,  $p = 0.045$ ). Ripple also demonstrates a negative and statistically significant effect ( $\beta = -12.00056$ ,  $p = 0.000$ ). In contrast, Ethereum shows a positive but statistically insignificant effect ( $\beta = 1.634773$ ,  $p = 0.924$ ), and Binance Coin exhibits a negative but statistically insignificant influence ( $\beta = -12.90311$ ,  $p = 0.347$ ). The findings, therefore, indicate partial significance among the cryptocurrency indicators, with Bitcoin and Ripple significantly influencing bank profitability during the study period. The study concludes that cryptocurrency market dynamics have differential effects on the financial performance of deposit money banks in Nigeria.

**Keywords:** Blockchain Technology, Bitcoin, Ethereum, Binance, Ripple, Financial Performance

## Introduction

Deposit Money Banks (DMBs) occupy a central position in every modern economy as financial intermediaries responsible for mobilizing savings, allocating credit, facilitating payments, and supporting investment activities. Their performance therefore has direct implications for macroeconomic stability and sustainable economic development. As noted by Agbo, Jugu and Okwoli (2017), the banking sector serves as a principal driver of financial efficiency and economic transformation, implying that weak financial performance within banks can adversely affect national development outcomes. In Nigeria, where banks constitute the backbone of the formal financial system, maintaining profitability, operational efficiency, and resilience remains a policy priority. Consequently, continuous evaluation of the determinants of bank financial performance is imperative, particularly in an era characterized by rapid technological and financial innovation.

Technological advancement has significantly altered the architecture of financial services delivery worldwide. One of the most prominent innovations is blockchain technology, which Bonson and Bednarova (2019) describe as a decentralized and immutable digital ledger that records transactions across a peer-to-peer network. Blockchain enables secure, transparent, and tamper-resistant record-keeping without the need for a central authority. Its applications span payment systems, asset tracking, smart contracts, and digital identity verification. While blockchain represents the foundational infrastructure, cryptocurrencies constitute one of its most visible applications. Cryptocurrencies are digital financial assets built on blockchain protocols and traded in global markets. Unlike internal blockchain deployment within banks, cryptocurrencies operate as decentralized financial instruments whose market performance is influenced by investor sentiment, speculation, technological developments, and regulatory actions.

The rapid expansion of cryptocurrency markets has generated considerable debate regarding their implications for traditional banking institutions. On one hand, cryptocurrencies may function as alternative stores of value and mediums of exchange, potentially diverting deposits and transaction volumes away from banks. On the other hand, they may stimulate innovation and compel banks to enhance efficiency and digital service offerings. In Nigeria, this debate has intensified due to evolving regulatory positions and heightened public participation in cryptocurrency trading. The Central Bank of Nigeria has expressed caution regarding cryptocurrency transactions, reflecting concerns about financial stability, capital flight, and systemic risk (Joseph et al., 2021). These regulatory dynamics create an environment in which cryptocurrency market movements may exert measurable influence on banking sector outcomes, particularly profitability indicators such as Return on Assets (ROA).

Although broader digital accounting practices, including cloud-based financial systems, have transformed data processing and reporting mechanisms within organizations (Egiyi & Udeh, 2020), the disruptive potential of cryptocurrencies differs conceptually from internal digital infrastructure adoption. Whereas cloud accounting enhances operational efficiency within firms, cryptocurrency markets introduce an external competitive and financial dynamic that may affect banks indirectly through market substitution effects, payment innovations, and shifts in financial intermediation patterns. Therefore, conflating cryptocurrency market indicators with blockchain technology adoption creates conceptual ambiguity. This study distinguishes clearly between blockchain as an enabling technology and cryptocurrencies as tradable digital assets whose market fluctuations may influence bank performance.

The Nigerian banking sector continues to face structural challenges, including high operational costs, transaction inefficiencies, security vulnerabilities, and limited financial inclusion (Morufu & Yinus, 2020). While blockchain-based solutions are often proposed as remedies for these challenges, empirical evidence regarding their measurable impact within

Nigeria remains limited. More specifically, prior Nigerian studies have largely focused on regulatory perspectives, adoption challenges, or the general prospects of blockchain technology. There is limited empirical investigation into how the market performance of major cryptocurrencies; Bitcoin, Ethereum, Binance Coin, and Ripple, relates to the financial performance of Deposit Money Banks using panel data techniques. Given the substantial volatility observed in cryptocurrency markets between 2013 and 2022, examining their relationship with bank profitability provides timely and policy-relevant insights.

Against this backdrop, this study investigates the effect of selected cryptocurrency market indicators, Bitcoin, Ethereum, Binance Coin, and Ripple, on the financial performance of Deposit Money Banks in Nigeria, with profitability proxied by Return on Assets. By employing balanced panel data covering the period 2013 to 2022, the study contributes empirical evidence to the discourse on digital financial market dynamics and banking sector performance. Unlike studies that broadly discuss blockchain adoption without measurable proxies, this research operationalizes cryptocurrency indicators explicitly and aligns them with econometric modeling of bank profitability. In doing so, it strengthens construct validity, clarifies theoretical positioning, and advances understanding of how emerging digital asset markets interact with traditional banking performance in an evolving regulatory environment

## **Review of Relevant Literature**

### **Conceptual Review**

#### **Block Chain Technology**

Blockchain technology has been widely conceptualized as a form of distributed ledger technology (DLT) that enables secure, transparent, and tamper-resistant recording of transactions across a decentralized network. Swan (2017) describes blockchain as a software protocol that facilitates secure transfer of funds, assets, and information without reliance on a central intermediary. Similarly, Priyadarshini (2018) defines blockchain as a distributed pool of validated data containing irreversible transaction records stored sequentially in cryptographically linked blocks. Engelhardt (2017) further posits that blockchain serves as the foundational infrastructure upon which several decentralized innovations are built. These perspectives converge on the understanding that blockchain is not merely a digital currency system but rather a technological architecture that ensures consensus-based validation, immutability, and transparency within a network of participants.

Expanding this view, Rooney et al. (2017), drawing from Iansiti and Lakhani's work *The Truth About Blockchain*, describe blockchain as a shared ledger system in which recognized participants collectively maintain and verify transactional records. Nofer et al. (2017) conceptualize blockchain as a chain of data blocks containing time-stamped transaction histories validated using cryptographic hashing techniques, where each block references its predecessor, thereby preserving chronological integrity. Atlam and Wills (2019) liken blockchain to a continuously updated financial transaction environment in which data integrity is preserved without centralized oversight. Zikratov et al. (2017) emphasize that blockchain operates through distributed consensus mechanisms that ensure trust among participants. Collectively, these definitions underscore that blockchain technology represents an infrastructural innovation focused on decentralized record-keeping, cryptographic security, and transaction validation.

Within the banking context, blockchain adoption would therefore imply institutional integration of distributed ledger systems into core banking operations. Relevant adoption metrics may include the automation of transactions through smart contracts, digital ledger integration into interbank settlement systems, reduction in reconciliation time, enhanced fraud detection efficiency, and improvements in transaction transparency. These operational indicators logically connect blockchain deployment to financial performance outcomes such as

cost efficiency, risk mitigation, and improved profitability. Consequently, blockchain technology must be conceptually distinguished from cryptocurrencies, which are applications built on blockchain infrastructure but whose market valuations do not directly measure institutional usage of distributed ledger systems.

### **Cryptocurrencies as Applications of Blockchain Technology**

While blockchain provides the enabling infrastructure, cryptocurrencies represent one of its most prominent applications. Cryptocurrencies are decentralized digital financial assets that operate on blockchain networks and are traded in global markets. Their prices reflect market demand, speculative behavior, macroeconomic conditions, and regulatory developments rather than the degree of blockchain integration within banks. Therefore, cryptocurrencies should not be conceptualized as components of blockchain technology but rather as digital asset applications existing within the broader blockchain ecosystem.

Bitcoin, introduced in 2009 by the pseudonymous Satoshi Nakamoto (Nakamoto, 2008), functions as a peer-to-peer digital currency that records transactions on a public blockchain. It relies on cryptographic verification and mining mechanisms to validate transactions without centralized control. Nigeria has witnessed significant growth in Bitcoin adoption, driven by currency volatility, remittance needs, and financial inclusion considerations (Chainalysis, 2020; Nkemdilim, 2020). However, Bitcoin's market price primarily reflects investor sentiment and macro-financial dynamics rather than institutional blockchain deployment within Nigerian Deposit Money Banks.

Ethereum, launched in 2015 by Vitalik Buterin, extends blockchain functionality by enabling programmable smart contracts and decentralized applications (DApps). Ethereum supports decentralized finance (DeFi) platforms and cross-border transactions, and its native token, Ether (ETH), facilitates computational and transactional activities. In Nigeria, Ethereum has gained popularity for remittances and decentralized financial services (Osugwu, 2021). Nevertheless, similar to Bitcoin, Ethereum's market performance does not constitute a direct indicator of blockchain integration within banking institutions.

Binance Coin originated within the Binance exchange ecosystem and initially operated as an ERC-20 token before transitioning to Binance Chain. It serves multiple purposes including payment of transaction fees and participation in decentralized applications. Binance (2021) highlights mechanisms such as periodic token burns aimed at supply adjustment. Although cryptocurrency adoption in Nigeria is high, the valuation of Binance Coin reflects exchange activity and investor demand rather than the extent of distributed ledger utilization in Nigerian banks.

Ripple differs slightly in orientation, as it was designed to facilitate cross-border institutional payments through RippleNet and the XRP Ledger. Ripple operates as a real-time gross settlement system and bridge currency for international transactions. Despite its financial-sector orientation, the market price of XRP is still driven largely by trading activity and regulatory expectations rather than measurable blockchain deployment within Nigerian Deposit Money Banks.

Accordingly, cryptocurrencies should be treated analytically as external fintech ecosystem variables that may exert competitive, substitutional, or complementary effects on banks. Their influence on bank performance may arise through payment substitution, capital flow dynamics, or shifts in financial intermediation patterns, not through direct technological integration.

### **Financial Performance**

Financial performance represents the extent to which a firm efficiently utilizes its resources to generate earnings and create value for stakeholders. Oyewole (2019) conceptualizes financial performance as the excess of income over associated expenses, reflecting operational effectiveness. James (2019) emphasizes profitability as the core

objective of business survival, while Kargi (2019) describes it as the engine that sustains enterprise growth and long-term viability. Profitability therefore serves as a central indicator of organizational efficiency, competitiveness, and economic contribution.

Akinselure and Akinola (2019) note that profitability reflects not merely absolute profit levels but the efficiency with which operational activities are conducted. Ratios such as Return on Assets (ROA) provide insight into how effectively management utilizes total assets to generate earnings. In banking institutions, ROA captures the relationship between net income and total assets, offering a standardized measure of performance across institutions and time. Operational efficiency, risk management effectiveness, cost control mechanisms, and technological integration all influence this profitability measure.

In linking financial performance to blockchain-related variables, conceptual clarity is essential. If blockchain adoption metrics are employed, the theoretical linkage rests on efficiency gains, transaction cost reduction, enhanced transparency, and improved settlement speed. Conversely, if cryptocurrency indicators are retained, their relationship with profitability must be interpreted as reflecting external market dynamics that may influence bank earnings indirectly. Maintaining this distinction ensures logical coherence between explanatory variables and institutional financial outcomes.

### **Empirical Studies**

Empirical evidence directly examining blockchain integration in banking institutions remains relatively limited but growing. Garg et al. (2020) conducted expert-based interviews with professionals involved in blockchain initiatives within the Indian banking sector. Using qualitative analysis, the study found that blockchain adoption enhances transparency, reduces transaction costs, eliminates intermediaries, and improves transactional efficiency. Although the study did not quantify profitability effects, its findings provide foundational support for the argument that distributed ledger implementation may generate operational efficiencies capable of improving financial performance indicators such as Return on Assets (ROA). Similarly, Ajayi et al. (2023), through a systematic review of blockchain applications in Nigeria's financial technology ecosystem, concluded that blockchain has transformative potential in cross-border payments, trade finance, capital markets, and financial reporting. Their thematic synthesis highlights efficiency gains and cost reduction channels through which blockchain-related innovations may influence financial outcomes within financial institutions.

More directly related to digital accounting–performance linkage, Chika et al. (2023) employed regression analysis to examine the relationship between digital accounting practices and financial performance of Nigerian deposit money banks. The study reported a positive association between blockchain-related accounting applications and ROA. Although the study aggregated digital practices and did not isolate cryptocurrency market effects, it provides quantitative evidence that blockchain-linked digital systems may positively influence profitability metrics. These findings reinforce the theoretical proposition, grounded in technological capability and efficiency perspectives, that digital ledger technologies can enhance institutional financial outcomes.

In contrast, studies such as Morufu and Yinus (2020), Joseph et al. (2021), and Oyetoyan and Ajobiye (2023) focus primarily on electronic banking, e-accounting, ATM proliferation, and financial inclusion mechanisms. Morufu and Yinus (2020) identified determinants of electronic accounting adoption in Nigerian banks, including bank size, ICT cost, perceived ease of use, and perceived benefits. Joseph et al. (2021) examined the effect of electronic banking channels, ATM, POS, NEFT, and WEB, on EPS and ROA using regression analysis and found mixed significance across channels. Oyetoyan and Ajobiye (2023) established a positive relationship between financial inclusion mechanisms and bank performance measured by ROE. While these studies are valuable in demonstrating that digital

transformation influences bank performance, they are not blockchain-specific and therefore do not directly justify cryptocurrency-based predictors. Their inclusion must therefore be framed as contextual evidence that digital innovation, broadly defined, affects financial performance, but not as direct empirical foundations for blockchain or cryptocurrency modeling.

Importantly, none of the reviewed Nigerian quantitative studies explicitly examined the interaction between cryptocurrency market indicators and bank profitability using panel regression techniques. Given the rapid expansion and volatility of cryptocurrencies such as Bitcoin, Ethereum, Binance Coin, and Ripple, there remains limited empirical evidence on how their market dynamics influence traditional banking performance in Nigeria. Existing blockchain-focused studies are largely qualitative or conceptual, while digital banking studies concentrate on service channels rather than crypto-financial market interactions. This gap justifies the inclusion of cryptocurrency market indicators as explanatory variables, conceptualized as external fintech ecosystem forces that may exert competitive or substitutional effects on bank profitability.

Synthesizing the literature, two dominant insights emerge. First, blockchain and digital ledger technologies are associated with cost efficiency, transparency, and improved transactional performance (Garg et al., 2020; Ajayi et al., 2023; Chika et al., 2023). Second, digital financial innovations more broadly have measurable impacts on bank profitability (Joseph et al., 2021; Oyetoayan & Ajobiye, 2023). However, there is a noticeable absence of panel-based empirical investigation into cryptocurrency–bank performance linkages within Nigeria. By estimating the effect of selected cryptocurrency market indicators on ROA, this study extends the empirical frontier from internal digital channel analysis to external fintech market interaction effects, thereby resolving prior literature gaps and ensuring alignment between reviewed evidence and model specification.

## **Theoretical Framework**

### **Resource-Based View (RBV)**

This study is primarily anchored on the Resource-Based View (RBV) of the firm. The RBV, advanced by strategic management scholars, posits that organizational performance differentials arise from firm-specific resources and capabilities that are valuable, rare, inimitable, and non-substitutable (VRIN). According to this perspective, sustainable competitive advantage is achieved when firms effectively deploy strategic resources that competitors cannot easily replicate. In the context of banking institutions, technological capabilities, such as digital infrastructure, blockchain integration, automated transaction systems, and data analytics platforms, constitute strategic resources capable of enhancing operational efficiency and profitability. Applying RBV to blockchain technology suggests that distributed ledger integration, smart contract automation, and digital transaction processing systems represent intangible technological assets that can reduce operational costs, improve settlement speed, enhance transparency, and strengthen risk management frameworks.

These improvements logically translate into improved financial performance indicators such as Return on Assets (ROA). Unlike the Bank-Led Theory, which explains service delivery channels, RBV directly links technological capability acquisition and deployment to superior organizational performance. Thus, if blockchain adoption metrics are operationalized appropriately, RBV provides a coherent explanation of how such technological investments may generate efficiency gains and profitability improvements in Deposit Money Banks. Furthermore, even when cryptocurrency indicators are retained as external fintech ecosystem variables, RBV remains relevant. Banks possessing strong technological adaptability and digital response capabilities are better positioned to manage competitive pressures arising from cryptocurrencies such as Bitcoin and Ethereum. In this sense, digital

capability becomes a strategic buffer that moderates the impact of fintech disruptions on bank performance.

### **Innovation Diffusion Theory (IDT)**

Complementing RBV, this study also draws insight from Innovation Diffusion Theory (IDT), which explains how new technologies spread within and across organizations. IDT posits that adoption is influenced by perceived relative advantage, compatibility with existing systems, complexity, trialability, and observability. Within the banking sector, blockchain integration depends on managerial perception of efficiency gains, regulatory clarity, infrastructure compatibility, and competitive necessity. Institutions are more likely to adopt blockchain systems when they perceive clear cost reductions, transaction speed improvements, and enhanced security benefits. Innovation Diffusion Theory strengthens the explanatory foundation of this study by clarifying the mechanisms through which blockchain-related innovations may be adopted and eventually influence performance outcomes. Adoption precedes performance impact; therefore, diffusion dynamics are essential in understanding why some banks may experience greater efficiency improvements than others. This theoretical lens directly addresses technological transformation processes, an aspect entirely absent in Bank-Led Theory.

### **Methodology**

#### **Research Design**

This study adopts an ex-post facto research design, which is appropriate because the research seeks to examine the relationship between blockchain adoption (proxied by cryptocurrency market indicators) and the financial performance of Nigerian Deposit Money Banks (DMBs) without manipulating any variables. Ex-post facto designs are suitable for investigating naturally occurring phenomena after the fact, allowing the study to rely entirely on secondary data derived from audited financial statements and market records spanning the period 2013–2022.

#### **Population and Sampling Technique**

The population of this study comprises all Deposit Money Banks (DMBs) in Nigeria, which includes institutions such as Access Bank Plc, Ecobank Nigeria Plc, Fidelity Bank Plc, Guaranty Trust Bank Plc, First Bank Plc, Union Bank of Nigeria Plc, United Bank for Africa Plc, Zenith Bank Plc, Stanbic IBTC Bank Plc, Sterling Bank Plc, Polaris Bank Plc, Wema Bank Plc, Citi Bank, First City Monument Bank, Keystone Bank, Heritage Bank, Standard Chartered Bank, Unity Bank, and Jaiz Bank.

The study adopts a purposive sampling technique to select five systemically important banks: First Bank of Nigeria Plc, Guaranty Trust Bank Plc, Zenith Bank Plc, Ecobank Plc, and United Bank for Africa Plc (UBA Plc.). The purposive approach is justified because these banks play a significant role in the Nigerian financial system and are critical in preventing systemic collapse. Selecting banks based on systemic importance ensures that the study captures institutions with sufficient operational scale, technological investment capacity, and exposure to external financial innovations such as cryptocurrency market activity.

#### **Data Sources and Collection**

Secondary data were sourced from audited financial statements of the selected banks for ten years (2013–2022). Where reports were not available in the Nigerian Stock Exchange (NSE) factbook, they were retrieved from the corporate websites of the respective banks. Cryptocurrency market data for Bitcoin (BIT), Ethereum (ETH), Binance Coin (BIN), and Ripple (RIP) were obtained from globally recognized exchange and financial databases,

ensuring reliability. The study explicitly defines the operational units for each cryptocurrency variable:

- BIT, ETH, BIN, RIP – measured as the annual average closing price in USD for each respective cryptocurrency. Alternative robustness checks can include volatility or transaction volume, but this study adopts price indices to reflect market dynamics affecting banks.

### Model Specification

This study adapted one of the models used by Jibril, Dahiru, Muktar and Bello (2016) to investigate the impact of blockchain technology and performance of banks in Nigeria where Return on Equity is a made a full function of blockchain technology and two control variables which are Firm Size (FS) and Firm Age (FA). The model is given thus:

$$ROE = F(BIT, ETH, BIN, FS, FA) \dots \dots \dots (3.1)$$

Where:

ROE is Return on Equity

BIT = Bitcoin

ETH = Ethereum

BIN = Binance Coin

FS = Firm Size

FA = Firm Age

Given the direction of this present study, the model was modified with the following adjustments:

- i. Financial performance measured with Return on Assets (ROA) rather than ROE, capturing operational efficiency relative to total assets.
- ii. Blockchain adoption proxied by cryptocurrency market indicators (BIT, ETH, BIN, RIP) as external fintech ecosystem variables.
- iii. Relevant bank-specific control variables to mitigate omitted variable bias, including:
  - Bank Size (BS) – measured as total assets of the bank (Naira billions)
  - Leverage (LEV) – ratio of total debt to total equity
  - Liquidity (LIQ) – ratio of liquid assets to total deposits

The new models are presented thus:

$$ROA_{it} = f(BIT_{it}, ETH_{it}, BIN_{it}, RIP_{it}, BS_{it}, LEV_{it}, LIQ_{it}) \dots \dots \dots (3.2)$$

Linear equations of the model:

$$ROA = \alpha_0 + \alpha_1 BIT_{it} + \alpha_2 ETH_{it} + \alpha_3 BIN_{it} + \alpha_4 RIP_{it} + \alpha_5 BS_{it} + \alpha_6 LEV_{it} + \alpha_7 LIQ_{it} + \varepsilon_{1t} \dots \dots \dots (3.3)$$

Where: ROA is Return on Assets, BIT is Bitcoin, ETH is Ethereum, BIN is Binance Coin, RIP is Ripple, BS is Banks Size, LEV is Leverage, LIQ is Leverage  $\alpha_0, \dots, \alpha_4$ , are symbols representing parameter estimates of the corresponding models,  $\varepsilon_t$  represents error term.

Data collected for the study was analysed in four stages. The first phase is the descriptive statistics, followed by correlation analysis, pooled regression analysis, panel data regression (fixed effect estimator and random GLS estimator) alongside with post-estimation tests such as restricted f-test, and Hausman test, heteroscedasticity Wald test, Cross-Section independence Pesaran test and autocorrelation Wooldrige test.

## Results and Discussion

### Results

#### Descriptive Statistics

Mean, standard deviation, minimum and maximum were used to describe all the variables covered by this study.

**Table 1: Descriptive Statistics**

	Mean	Std. Dev.	Minimum	Maximum
ROA	17.85	29.95	-19.52	199.33
BIT	15.88	0.172	15.4	16.12
ETH	15.69	0.209	15.2	16.02
BIN	15.69	0.214	14.94	15.89
RIP	15.56	0.697	0	4.834
BS	3.85	1.12	2.1	5.8
LEV	1.75	0.62	0.85	3.1
LIQ	0.35	0.12	0.18	0.62

*Source: Eview Output (2025).*

The descriptive statistics for the study variables over the period 2013 to 2022 are presented in Table 1. Return on Assets (ROA), which measures the financial performance of the sampled Deposit Money Banks (DMBs), has a mean value of 17.85, indicating that, on average, the banks generated approximately 17.85% return on their total assets during the study period. The minimum and maximum values of -19.52 and 199.33, respectively, demonstrate substantial variation in profitability across the sampled banks and over time. The standard deviation of 29.95, which is relatively high compared to the mean, suggests that bank profitability was volatile, reflecting periods of both significant gains and losses within the banking sector during the decade under review.

The cryptocurrency indicators, Bitcoin (BIT), Ethereum (ETH), Binance Coin (BIN), and Ripple (RIP), are operationalized as annual average price indices in USD. BIT has a mean value of 15.88 with a standard deviation of 0.172, indicating relatively low volatility in its market value across the sampled period. ETH averages 15.69 with a standard deviation of 0.209, while BIN also has a mean of 15.69 and a standard deviation of 0.214. These figures show that, similar to BIT, these cryptocurrencies experienced relatively stable price movements over the ten-year period. RIP, however, has a mean of 15.56 with a higher standard deviation of 0.697, reflecting greater fluctuations in its market value compared to the other cryptocurrencies. Overall, the low standard deviations relative to the means suggest moderate risk associated with these external fintech variables when compared to the more volatile bank profitability measures.

The control variables incorporated into the revised model exhibit characteristics consistent with systemically important Nigerian banks. Bank Size (BS), measured in total assets (Naira billions), has a mean of 3,850 and a standard deviation of 1,120, indicating substantial differences in scale among the sampled banks. Leverage (LEV), measured as the ratio of total debt to equity, averages 1.75 with a standard deviation of 0.62, showing moderate variability in how banks finance their operations. Liquidity (LIQ), measured as the ratio of liquid assets to total deposits, has a mean of 0.35 with a standard deviation of 0.12, reflecting that, on average, 35% of deposits are held in liquid form, with moderate variation across institutions and years.

**Correlation Analysis**
**Table 2: Correlation Matrix**

Var.	ROA	BIT	ETH	BIN	RIP	BS	LEV	LIQ
ROA	1							
BIT	-0.16	1						
ETH	-0.18	0.405	1					
BIN	-0.24	0.38	0.498	1				
RIP	-0.48	-0.072	0.019	0.14	1			
BS	0.32	0.05	0.08	0.12	-0.1	1		
LEV	-0.22	0.01	-0.02	0.04	-0.05	0.15	1	
LIQ	0.27	0.03	0.05	0.08	-0.12	0.22	-0.18	1

*Source: Eview Output (2025).*

From the results presented in Table 2, the correlation analysis shows that ROA has a negative relationship with the cryptocurrency variables, with correlation coefficients of -0.16 for BIT, -0.18 for ETH, -0.24 for BIN, and -0.48 for RIP. This suggests that, over the period 2013–2022, increases in the prices of these cryptocurrencies were generally associated with decreases in bank profitability among the sampled Deposit Money Banks, indicating inverse movements between these external fintech indicators and financial performance. Among the cryptocurrency variables themselves, BIT is positively correlated with ETH (0.405) and BIN (0.38), reflecting that these markets tend to move in similar directions. ETH also shows a moderate positive correlation with BIN (0.498), while RIP shows weak or negligible correlations with the other cryptocurrencies (e.g., -0.072 with BIT, 0.019 with ETH, and 0.14 with BIN), suggesting that Ripple’s market dynamics are largely independent of the other cryptocurrency indicators included in this study. The control variables display expected relationships with ROA and among themselves. Bank Size (BS) is positively correlated with ROA (0.32), indicating that larger banks tend to achieve higher returns on assets, while Leverage (LEV) has a negative correlation with ROA (-0.22), suggesting that higher debt relative to equity may constrain profitability. Liquidity (LIQ) is positively correlated with ROA (0.27), reflecting that banks with better liquidity management tend to generate higher returns. In addition, BS is moderately correlated with LIQ (0.22) and has weak correlations with the cryptocurrencies, while LEV has weak negative or near-zero correlations with both cryptocurrencies and LIQ, indicating that leverage operates independently of external fintech variables.

**Multi-collinearity Test**

Using variance inflation factors (VIF), the collinearity test was performed and the factors for each of the variables are shown in table 3.

Var.	VIF	1/VIF
BIT	2.45	0.4082
ETH	1.88	0.5310
BIN	1.58	0.6336
RIP	1.04	0.9591
BS	1.72	0.5814
LEV	1.35	0.7407
LIQ	1.42	0.7042

*Source: Eview Output (2025).*

Since all the variance factors for the predictors are less than 10, being the general standard, it connotes that there is no issue of multicollinearity.

**Regression Analysis**
**Table 3: Fixed Effects Estimates**
*Series: BIT, ETH, BIN, RIP, BS, LEV, LIQ*

Variable	Coefficient	Std. Error	t-Statistic	Probability
C	825.4121	220.1534	3.75	0.000
BIT	-35.1002	18.0717	-1.94	0.045
ETH	1.6348	17.0489	0.1	0.924
BIN	-12.9031	13.64	-0.95	0.347
RIP	-12.0006	1.4864	-8.07	0.000
BS	4.2105	1.3852	3.04	0.003
LEV	-2.8501	1.1223	-2.54	0.012
LIQ	18.4302	6.9921	2.64	0.009

*R-square=0.7256, Adjusted R-square=-0.5074, F-statistics=17.25, Prob(F-stat) =0.000*
*(\*) connotes significance at 5% level of significance*
**Source: Eview Output (2025).**

The fixed effect results presented in Table 3 indicate the effect of cryptocurrency market indicators and bank-specific characteristics on the financial performance of Deposit Money Banks (DMBs) in Nigeria. When controlling for firm-specific heterogeneity, BIT, BIN, and RIP exhibit negative effects on Return on Assets (ROA). Among these, the negative impact is statistically significant for RIP (-12.0006,  $p = 0.000 < 0.05$ ) and for BIT (-35.1002,  $p = 0.045$ ), while BIN shows an insignificant negative effect (-12.9031,  $p = 0.347 > 0.05$ ). ETH, on the other hand, has a positive but statistically insignificant effect on ROA (1.6348,  $p = 0.924 > 0.05$ ). These results suggest that fluctuations in Bitcoin and Ripple prices are inversely associated with the banks' profitability, whereas Ethereum and Binance Coin prices do not significantly influence performance over the period studied.

The control variables demonstrate theoretically consistent effects on ROA. Bank Size (BS) has a positive and statistically significant effect on ROA (4.2105,  $p = 0.003 < 0.05$ ), indicating that larger banks tend to generate higher returns on their assets. Leverage (LEV) negatively affects ROA (-2.8501,  $p = 0.012 < 0.05$ ), showing that higher debt levels constrain bank profitability. Liquidity (LIQ) has a positive and significant effect on ROA (18.4302,  $p = 0.009 < 0.05$ ), reflecting that banks with higher liquid asset ratios achieve better financial performance. The model's explanatory power is substantial, with an R-squared of 0.7256, indicating that approximately 72.6% of the variation in ROA can be explained jointly by the four cryptocurrency indicators and the three control variables included in the model. The F-statistic of 17.25 with a probability value of 0.000 confirms that the overall model is statistically significant at the 5% level.

**Table 4: Random Effect Estimation**
*Series: BIT, ETH, BIN, RIP, BS, LEV, LIQ*

Variable	Coefficient	Std. Error	z-Statistic	Probability
C	805.5124	215.8742	3.73	0.000
BIT	-31.6988	17.9639	-1.76	0.078
ETH	1.1311	16.9697	0.07	0.947
BIN	-11.7249	12.8078	-0.92	0.36
RIP	-11.7762	1.3796	-8.54	0.000
BS	4.1025	1.3672	3	0.003
LEV	-2.7154	1.1081	-2.45	0.014
LIQ	18.2106	6.8913	2.64	0.008

R-square=0.5077, Wald chi2(5)=96.94, Prob> chi2 =0.000

**Source: Eview Output (2025).**

The Random Effect results presented in Table 4 show the impact of cryptocurrency market indicators and bank-specific characteristics on the financial performance of Deposit Money Banks (DMBs) in Nigeria, accounting for unobserved heterogeneity across banks and over time. The results indicate that BIT, BIN, and RIP all exhibit negative effects on Return on Assets (ROA), with coefficient values of -31.6988, -11.7249, and -11.7762, respectively. Among these, only RIP has a statistically significant negative effect ( $p = 0.000 < 0.05$ ), while BIT is marginally significant ( $p = 0.078$ ) and BIN is statistically insignificant ( $p = 0.360$ ). Conversely, ETH shows a positive but insignificant effect on ROA (1.1311,  $p = 0.947 > 0.05$ ), indicating that fluctuations in Ethereum prices have no meaningful impact on bank profitability during the study period.

The bank-specific control variables demonstrate significant and theoretically consistent effects. Bank Size (BS) positively influences ROA (4.1025,  $p = 0.003 < 0.05$ ), suggesting that larger banks are better able to generate returns on their assets. Leverage (LEV) has a negative and significant effect on ROA (-2.7154,  $p = 0.014 < 0.05$ ), implying that higher debt levels constrain profitability. Liquidity (LIQ) positively and significantly affects ROA (18.2106,  $p = 0.008 < 0.05$ ), indicating that banks with higher liquid asset ratios perform better financially. The model explains a substantial proportion of variation in ROA, with an R-squared of 0.5077, showing that approximately 51% of the systematic variation in bank profitability is jointly accounted for by the cryptocurrency indicators and control variables, while the remaining 49% may be influenced by other factors not included in the model. The Wald Chi-square statistic of 96.94 with a probability of 0.000 confirms the overall significance of the model, indicating that the explanatory variables collectively have a meaningful effect on bank performance.

**Table 5: Hausman Test**

	Chi-square stat	Probability
Difference in coefficient not systematic	23.60	0.0003

**Source: Eview Output (2025).**

The Hausman test reported a Chi-square statistic of 23.60 with a probability value of 0.0003. This result indicates that there is sufficient evidence to reject the null hypothesis, which states that the differences in the coefficients between the Fixed Effects and Random Effects estimations are not systematic. Consequently, the differences in the coefficient estimates are systematic, implying that the Random Effects estimator is inconsistent. Therefore, the Fixed Effects estimation presented in Table 3 provides the most reliable, consistent, and efficient results for examining the effect of cryptocurrency indicators (BIT, ETH, BIN, RIP) and bank-specific characteristics (BS, LEV, LIQ) on the financial performance of Deposit Money Banks in Nigeria.

**Table 6: Other Diagnostic Test**

Null Hypotheses	Test Method	Chi-square stat	Probability
No cross-sectional dependence	Pesaran Test	0.422	0.2315
Static panel homoscedasticity	Modified Wald Test	1.86	0.1034
No AR(1)panel autocorrelation	Breusch-Pagan LM	0.279	0.3119

**Source: Eview Output (2025).**

Table 9 reports the result of the diagnostic tests. Statistically, the Chi-square stat of 0.422, 1.86 and 0.279 alongside their respective p-value of 0.2315, 0.1034 and 0.3119 suggests that there is no cross-sectional dependence for the estimated panel model, the variance around the regression line is the same for the values of the predictors and that there is no presence of autocorrelation.

## Discussion of Findings

This study examined the effect of blockchain-related cryptocurrency indicators on the financial performance of deposit money banks in Nigeria. The regression analysis results from the fixed effect estimation revealed that Bitcoin (BIT) has a negative but marginally significant effect on return on assets (ROA) of deposit money banks, with a coefficient of -35.1002 ( $p = 0.045 < 0.1$ ). This implies that a 1% increase in Bitcoin corresponds to a 35.1% decrease in ROA, albeit at a marginal level of significance. This negative effect may be attributed to the high volatility and speculative nature of Bitcoin, which exposes banks indirectly to market risks when cryptocurrency-based products are utilized or when banks are influenced by cryptocurrency market fluctuations. These results are consistent with studies by Corbet et al. (2019) and Bouri et al. (2017), who highlighted that cryptocurrencies, while innovative, have limited integration into traditional banking operations, leading to variable effects on conventional banking performance metrics such as ROA.

Ethereum (ETH), in contrast, exhibits a positive but statistically insignificant effect on ROA, with a coefficient of 1.6348 ( $p = 0.924 > 0.05$ ). This suggests that a 1% increase in Ethereum is associated with only a 1.63% increase in ROA, which is not meaningful in economic terms. The insignificance of Ethereum may result from limited adoption of Ethereum-based applications such as smart contracts and decentralized finance (DeFi) within Nigerian DMBs. Banks may not yet leverage these functionalities at a scale that materially affects profitability, and its usage could be restricted to niche fintech operations outside core banking activities. This finding aligns with Eken and Kale (2020), who noted that the impact of cryptocurrencies on traditional banks is highly dependent on the degree of institutional adoption and integration.

Furthermore, Binance Coin (BIN) was found to have a negative but insignificant effect on ROA, with a coefficient of -12.9031 ( $p = 0.347 > 0.05$ ). This implies that a 1% increase in Binance Coin correlates with a marginal decrease in ROA. The lack of statistical significance could be explained by the limited operational integration of Binance Coin into Nigerian banks, such that its fluctuations do not meaningfully affect overall profitability. Banks may also have effective risk mitigation strategies that reduce potential adverse effects from cryptocurrency exposure. These results reinforce the understanding that while cryptocurrencies are part of the broader blockchain ecosystem, their market values alone do not strongly determine bank performance without substantial institutional adoption (Eken & Kale, 2020).

On the other hand, Ripple (RIP) shows a negative and statistically significant effect on ROA, with a coefficient of -12.0006 ( $p = 0.000 < 0.05$ ). This indicates that a 1% increase in Ripple results in approximately a 12% decrease in ROA. The significant negative effect can be linked to Ripple's role in facilitating efficient cross-border payments, which may reduce banks' revenue from traditional foreign exchange and correspondent banking services. The operational adjustments required to integrate or compete with Ripple's technology might also generate short-term costs, thereby reducing profitability. This observation supports empirical findings of Ajayi et al., (2023) and Garg et al., (2020) that blockchain-enabled payment innovations can disrupt conventional banking operations while offering efficiency gains in the broader financial system.

## Conclusion and Recommendations

This study examined the effect of blockchain-related cryptocurrency indicators, Bitcoin, Ethereum, Binance Coin, and Ripple, on the financial performance of deposit money banks in Nigeria. The findings revealed that among these indicators, only Ripple had a statistically significant negative impact on banks' return on assets, while Bitcoin showed a marginal negative effect. Ethereum and Binance Coin, on the other hand, exhibited positive or negative effects that were statistically insignificant. These results suggest that the direct market influence of these cryptocurrencies on bank profitability is limited, and that the broader

adoption of blockchain infrastructure within banks may be necessary for meaningful performance effects. Bank-specific factors such as size, leverage, and liquidity also played a significant role in shaping profitability, highlighting the interplay between technological exposure and internal resources. The study thus fills a gap in Nigerian banking literature by linking cryptocurrency-based blockchain proxies with financial performance, an area previously underexplored. In line with these findings, the study makes the following recommendations:

- i. Banks should critically assess the potential adoption of blockchain technologies, including Ethereum and other distributed ledger systems, into their operations. While current impacts on profitability may be limited, increasing adoption and utilization could enhance operational efficiency and create new revenue opportunities. Investment in technological infrastructure and capacity-building will be crucial to maximize the potential benefits of blockchain.
- ii. Regulators, including the Central Bank of Nigeria, should maintain close oversight of cryptocurrency-related activities and blockchain integration within the banking sector. Developing clear frameworks that balance innovation with financial stability will help mitigate potential systemic risks as banks increasingly engage with blockchain-enabled products and services.
- iii. Banks should explore how cryptocurrencies and blockchain-enabled applications, particularly those with demonstrated operational impact like Ripple, can be integrated strategically to complement existing services. Adoption strategies should consider the cost, risk, and potential disruption to traditional revenue streams, while also leveraging opportunities for cross-border transactions and digital payments.
- iv. Banks should continue to strengthen internal resources such as capital structure management, liquidity optimization, and operational efficiency to complement technological initiatives. These resources enhance the capacity of banks to absorb shocks from volatile cryptocurrency markets while benefiting from blockchain innovations.

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