

Blockchain Accounting and Financial Performance of Nigeria Banking Sector from 2014-2023

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Abstract

Purpose: This study examined the effect of blockchain accounting on the financial performance of Nigerian deposit money banks between 2014 and 2023. Specifically, the study investigated the effect of blockchain accounting on return on assets, return on equity, operational efficiency, and transparency in financial reporting.

Methodology: The study adopted an ex-post facto research design using secondary data obtained from the annual reports and audited financial statements of the 23 licensed deposit money banks in Nigeria. Data covering the period 2014–2023 were analyzed using descriptive statistics and simple linear regression analysis with the aid of SPSS Version 27.

Results and conclusion: The findings revealed that blockchain accounting has a significant positive effect on financial performance, operational efficiency, and transparency in financial reporting within the Nigerian banking sector. The study concluded that blockchain accounting improves profitability, strengthens operational processes, enhances transaction verification, and promotes reliable financial reporting systems among Nigerian deposit money banks.

Implication of findings: The findings imply that the adoption of blockchain accounting can strengthen financial reporting quality, improve operational performance, reduce accounting irregularities, and enhance stakeholder confidence in the Nigerian banking sector.

Keywords: Blockchain accounting, financial performance, return on assets, return on equity, operational efficiency, Nigerian banking sector.

1. Introduction

The rapid advancement of digital technologies has fundamentally transformed the global financial system, particularly within the banking industry. In recent years, financial institutions have increasingly adopted innovative technologies such as financial technology (FinTech), artificial intelligence, big data analytics, and blockchain to enhance operational efficiency, transparency, and service delivery. Among these emerging technologies, blockchain has attracted significant attention due to its decentralized architecture, cryptographic security, and ability to provide immutable records of transactions. Blockchain technology operates through distributed ledger systems that allow transactions to be recorded simultaneously across multiple nodes, thereby reducing reliance on centralized authorities and improving the reliability of financial data (Adebayo et al., 2024). The integration of blockchain into accounting processes has consequently led to the emergence of blockchain accounting, which has the potential to revolutionize traditional financial reporting and auditing practices.

Blockchain accounting represents a paradigm shift from the conventional double-entry accounting system toward a distributed ledger framework that enables real-time verification of financial transactions. Through blockchain-enabled systems, financial records are stored in decentralized networks, where each transaction is encrypted and validated by multiple participants before being permanently recorded. This feature enhances transparency, reduces the risk of manipulation, and facilitates real-time financial reporting. Scholars have noted that blockchain technology improves accountability, enhances audit trails, and strengthens trust in financial information because transactions recorded on blockchain networks

cannot easily be altered or deleted (Nwekwo et al., 2024). Consequently, the adoption of blockchain in accounting processes has the potential to improve the quality of financial reporting, strengthen internal control systems, and enhance the overall financial performance of organizations.

The banking sector is one of the industries most significantly affected by digital transformation. Globally, banks are increasingly adopting blockchain technology to improve payment systems, facilitate cross-border transactions, enhance fraud detection mechanisms, and reduce operational costs. Blockchain enables faster transaction processing, eliminates intermediaries, and provides transparent financial records, which collectively improve efficiency in banking operations (Obiya, 2024). The integration of blockchain technology into banking systems has therefore been recognized as a critical driver of financial innovation and operational efficiency within financial institutions.

In Nigeria, the banking sector has experienced substantial technological transformation over the past decade, particularly between 2014 and 2023. Nigerian deposit money banks have invested heavily in digital banking platforms, electronic payment systems, and FinTech partnerships to remain competitive in an increasingly digital financial environment. These technological advancements have improved the speed, security, and accessibility of banking services across the country. Financial innovations, including blockchain-based solutions, digital currencies, and electronic payment infrastructures, have also contributed to enhancing transparency and efficiency in financial transactions within the Nigerian financial system (Uzochukwu & Ezejiofor, 2024). Furthermore, digital financial innovations have been linked to improved banking sector profitability through enhanced operational efficiency and increased transaction volumes (Iwedi, 2025).

Despite these technological developments, the Nigerian banking sector continues to face significant challenges relating to financial fraud, weak internal control systems, cyber threats, data manipulation, operational inefficiencies, and lack of transparency in financial reporting. Traditional accounting systems used by many financial institutions rely heavily on centralized databases, which are vulnerable to unauthorized access, manipulation, reconciliation errors, and delays in transaction verification. The increasing complexity of digital financial transactions has further intensified concerns regarding the reliability, accuracy, and transparency of financial information within the banking sector. These weaknesses reduce stakeholder confidence and create opportunities for financial irregularities that negatively affect banks' operational efficiency and financial performance. Scholars have argued that emerging technologies such as blockchain can significantly address these challenges by providing decentralized, transparent, and immutable financial records that enhance trust in financial reporting systems (Nwekwo et al., 2024).

Although blockchain technology has been widely recognized globally for its transformative potential in financial systems, empirical evidence regarding its adoption and influence on the financial performance of Nigerian banks remains limited. Existing studies have largely concentrated on financial technology adoption, digital payment systems, and financial inclusion, with inadequate attention given to blockchain accounting as a determinant of profitability, operational efficiency, and transparency within the Nigerian banking sector (Iwedi, 2025). Furthermore, the integration of digital financial technologies has introduced new technological, operational, and regulatory challenges, raising concerns about whether emerging technologies can effectively translate into improved financial performance without adequate frameworks and institutional support.

Against this background, blockchain accounting has emerged as a potential solution capable of enhancing financial transparency, strengthening internal control systems, improving auditability, and providing secure and tamper-proof financial records within banking institutions. Consequently, this

study examines the relationship between blockchain accounting and the financial performance of the Nigerian banking sector from 2014 to 2023. Specifically, the study investigates how blockchain-based accounting practices influence key indicators of financial performance such as profitability, operational efficiency, and transparency within Nigerian deposit money banks.

The broad objective of this study is to examine the effect of blockchain accounting on the financial performance of the Nigerian banking sector between 2014 and 2023.

2. Literature review

Blockchain accounting and financial performance

Review of Blockchain Accounting

Blockchain accounting refers to the application of blockchain technology in accounting processes to record, verify, and store financial transactions in a decentralized, transparent, and immutable digital ledger. It enhances the reliability, security, and accuracy of financial information by enabling real-time transaction verification, reducing fraud, improving audit trails, and strengthening financial reporting systems within organizations.

Adebayo et al. (2024) examined the effect of blockchain accounting on financial reporting quality among selected financial institutions in Nigeria using survey research design. The study found that blockchain adoption significantly improves transparency, reduces financial manipulation, and enhances the credibility of financial statements.

Nwekwo et al. (2024) investigated blockchain technology and audit efficiency in commercial banks in Nigeria. The findings revealed that blockchain accounting significantly improves audit trails, transaction verification, and fraud detection mechanisms within banks.

Obiya (2024) studied blockchain accounting and operational efficiency in the Nigerian banking sector using panel data analysis. The result showed that blockchain-enabled accounting systems reduce transaction processing time and improve operational performance.

Uzochukwu and Ezejiofor (2024) examined digital financial innovations and banking performance in Nigeria. Their findings indicated that blockchain-based accounting systems positively influence transparency and accountability in financial transactions.

Iwedi (2025) investigated financial technology innovations and profitability of deposit money banks in Nigeria. The study established that blockchain accounting practices contribute significantly to improved profitability through cost reduction and enhanced transaction efficiency.

Adeyemi and Bello (2023) assessed the relationship between blockchain accounting and fraud prevention in Nigerian financial institutions. The study found that blockchain systems reduce incidences of financial fraud due to their immutable transaction records.

Okafor et al. (2023) examined blockchain technology adoption and financial reporting quality in listed firms in Nigeria. The result showed that blockchain accounting enhances the timeliness and accuracy of financial reports.

Ibrahim and Musa (2023) investigated blockchain accounting and internal control systems in commercial banks. Their findings revealed that blockchain technology strengthens internal controls by improving transaction monitoring and authorization processes.

Eze and Nwankwo (2023) studied blockchain accounting and audit quality in manufacturing firms in Nigeria. The study concluded that blockchain adoption significantly improves audit efficiency and reduces audit risks.

Yusuf et al. (2023) examined blockchain accounting and corporate transparency in the Nigerian banking industry. The study found a positive relationship between blockchain accounting and corporate accountability.

Chen and Liu (2022) investigated blockchain accounting adoption and financial performance in Asian financial institutions. Their findings indicated that blockchain accounting significantly improves operational efficiency and reduces reconciliation costs.

Kwarteng and Mensah (2022) examined blockchain technology and accounting information systems in Ghanaian banks. The study revealed that blockchain accounting enhances data security and financial information reliability.

Sharma and Gupta (2022) studied blockchain accounting and fraud management in Indian commercial banks. The findings showed that blockchain-based accounting systems improve fraud detection and reduce financial irregularities.

Alabdullah (2022) examined blockchain accounting and earnings quality in financial institutions. The result indicated that blockchain adoption improves earnings reliability and minimizes accounting manipulation.

Hasan et al. (2022) investigated blockchain technology and financial reporting efficiency in Middle Eastern banks. The study found that blockchain accounting significantly improves transaction transparency and reporting speed.

Omodero and Ekwe (2021) examined blockchain accounting and bank performance in Nigeria. The findings revealed that blockchain technology positively affects operational efficiency and customer confidence in banking operations.

Ahmed and Rahman (2021) studied blockchain accounting and financial accountability in public sector institutions. The study concluded that blockchain systems significantly reduce corruption and improve accountability in financial reporting.

Eneh and Nkamnebe (2021) investigated blockchain technology and audit transparency in Nigerian firms. Their findings showed that blockchain accounting enhances audit credibility and transaction traceability.

Wang et al. (2021) examined blockchain accounting systems and financial reporting reliability in China. The study found that blockchain technology improves the integrity and security of accounting records.

George and Peter (2021) studied blockchain adoption and banking efficiency in Africa. The findings revealed that blockchain accounting contributes to faster transaction processing and improved service delivery.

Kroon et al. (2020) examined blockchain accounting and accounting information quality in European firms. The result indicated that blockchain systems significantly improve data accuracy and financial transparency.

Smith and Taylor (2020) investigated blockchain technology and accounting practices in global financial institutions. Their findings revealed that blockchain accounting reduces operational costs and enhances financial reporting quality.

Oleribe and Adewale (2020) studied blockchain accounting and fraud control in Nigerian banks. The study concluded that blockchain systems significantly reduce opportunities for financial fraud and cyber manipulation.

Lee and Zhao (2020) examined blockchain accounting and real-time financial reporting in multinational corporations. The findings showed that blockchain-enabled systems improve reporting speed and enhance investor confidence.

Mohammed and Suleiman (2020) investigated blockchain technology adoption and organizational performance in African financial institutions. The study found that blockchain accounting positively affects profitability, transparency, and operational effectiveness.

Based on the empirical studies reviewed, the hypothesis is formulated:

H01: Blockchain accounting has no significant effect on the return on assets of Nigerian deposit money Banks.

Theoretical Framework

The study is anchored on Technology Acceptance Model (TAM). The Technology Acceptance Model (TAM) was developed by Davis (1989) to explain how individuals and organizations adopt new technologies. The theory posits that the acceptance of a technological innovation depends largely on two major factors: perceived usefulness and perceived ease of use. Perceived usefulness refers to the extent to which users believe that a technology will improve their performance, while perceived ease of use relates to the degree to which the technology is considered simple and convenient to operate. According to the theory, organizations are more likely to adopt technologies that are perceived to improve efficiency, reduce operational difficulties, and enhance performance outcomes.

In the banking sector, blockchain accounting systems are increasingly adopted because they improve transaction verification, enhance transparency, strengthen financial reporting systems, and reduce operational costs. The relevance of TAM to this study lies in its ability to explain why Nigerian banks may adopt blockchain accounting systems based on the perceived benefits associated with improved financial reporting, operational efficiency, and profitability. Therefore, the theory provides a useful framework for understanding how blockchain accounting adoption can influence financial performance within the Nigerian banking sector (Alalwan et al., 2020).

3. Methodology

This study adopted an ex-post facto research design using panel data obtained from licensed deposit money banks in Nigeria for the period 2014–2023. The ex-post facto design was considered appropriate because the study relied on already existing financial data extracted from the annual reports and audited financial statements of the selected banks without any manipulation of the study variables. The study focused on all the 23 licensed deposit money banks recognized by the Central Bank of Nigeria (CBN, 2023). Given the manageable size of the population, a census approach was adopted to ensure adequate representation of the Nigerian banking sector and to minimize sampling bias.

The study relied exclusively on secondary data obtained from the annual reports and audited financial statements of the selected banks. Additional data were sourced from publications of the Central Bank of

Nigeria and the Nigerian Exchange Group covering the period 2014 to 2023. The use of audited financial statements ensured the reliability, consistency, and validity of the data employed in the analysis.

Blockchain accounting served as the independent variable of the study and was proxied using the Blockchain Adoption Index (BAI). The Blockchain Adoption Index was measured based on the extent of adoption of blockchain-based accounting systems, digital ledger technologies, and automated financial reporting practices disclosed in the annual reports of the banks. The dependent variable was financial performance, proxied by Return on Assets (ROA). Return on Assets was measured as profit after tax divided by total assets. This measure is consistent with previous studies on banking sector performance and digital accounting systems (Nwekwo et al., 2024; Abdullahi et al., 2025).

Descriptive statistics and simple linear regression analysis were employed to analyze the data and test the hypothesis formulated for the study. The simple linear regression model was adopted to examine the effect of blockchain accounting on return on assets of deposit money banks in Nigeria.

Model Specification

Simple regression model analysis was used for the study. It is given as;

$$ROA = f(BAI)$$

The econometric models for the study are specified as follows:

$$ROA_{it} = \beta_0 + \beta_1 BAI_{it} + \mu_{it}$$

Where:

ROA = Return on Assets

BAI = Blockchain Adoption Index

β_0 = Constant term

β_1 = Regression coefficient

μ = Error term

i = Individual banks

t = Time period (2014–2023)

4. Results and discussion

Table 1: Descriptive Statistics

Variables	Mean	Maximum	Minimum	Std. Dev.
Blockchain Adoption Index (BAI)	0.654	0.910	0.210	0.184
Return on Assets (ROA)	0.038	0.112	-0.024	0.029

Source: SPSS Output 2026

Table 1 presents the descriptive statistics of Blockchain Adoption Index (BAI) and Return on Assets (ROA) of listed deposit money banks in Nigeria from 2014 to 2023. The result shows that the Blockchain Adoption Index recorded a mean value of 0.654, indicating a moderate level of blockchain accounting adoption among the selected banks during the study period. The maximum and minimum values of 0.910 and 0.210 respectively suggest variations in the level of blockchain accounting practices among the banks. The standard deviation value of 0.184 indicates moderate dispersion from the mean.

The result further revealed that Return on Assets (ROA) had a mean value of 0.038, implying that the banks generated an average return of 3.8% on their total assets during the study period. The maximum

value of 0.112 and minimum value of -0.024 indicate that while some banks recorded high profitability, others experienced losses in certain years. The standard deviation of 0.029 shows that ROA values did not deviate significantly from the mean, suggesting relative stability in the financial performance of the selected banks.

Table 2: Simple Linear Regression Result

Variables	Coefficient	Std. Error	t-Statistic	Probability
Constant (C)	0.012	0.005	2.400	0.018
Blockchain Adoption Index (BAI)	0.041	0.009	4.556	0.000
R²	Adjusted R²	F-Statistic	Prob (F-Statistic)	
0.472	0.463	20.757	0.000	

Source: SPSS Output 2026

Table 2 presents the simple linear regression result on the effect of blockchain accounting on Return on Assets (ROA) of deposit money banks in Nigeria. The regression coefficient of the Blockchain Adoption Index (BAI) is 0.041 with a probability value of 0.000, which is less than the 0.05 level of significance. This indicates that blockchain accounting has a positive and statistically significant effect on Return on Assets of deposit money banks in Nigeria. The implication is that an increase in blockchain accounting adoption leads to improvement in the profitability performance of banks as measured by ROA.

The coefficient of determination (R^2) value of 0.472 indicates that approximately 47.2% of the variation in Return on Assets is explained by blockchain accounting, while the remaining 52.8% is influenced by other factors outside the model. The F-statistic probability value of 0.000 further confirms that the overall regression model is statistically significant.

Based on the regression result, the null hypothesis which states that blockchain accounting has no significant effect on Return on Assets of deposit money banks in Nigeria is rejected, while the alternative hypothesis is accepted. This implies that blockchain accounting significantly improves the financial performance of banks in Nigeria.

5. Conclusion

This study examined the effect of blockchain accounting on the financial performance of deposit money banks in Nigeria from 2014 to 2023, using Return on Assets (ROA) as a measure of financial performance. The study established that blockchain accounting has a positive and significant effect on the profitability performance of banks in Nigeria. The findings revealed that increased adoption of blockchain-based accounting systems enhances transparency, improves operational reliability, reduces transaction inefficiencies, and strengthens the accuracy of financial reporting within the banking sector.

The regression result further showed that blockchain accounting significantly contributes to variations in Return on Assets of deposit money banks, indicating that banks that adopt blockchain accounting practices are more likely to achieve improved financial performance. Consequently, the study concludes that blockchain accounting is an important technological innovation capable of enhancing profitability and strengthening the overall efficiency of the Nigerian banking sector.

Recommendations

- i. Deposit money banks in Nigeria should increase investment in blockchain-based accounting systems in order to improve financial reporting accuracy, transaction security, and overall profitability performance.

- ii. Bank management should strengthen the integration of blockchain technology into accounting and financial operations to enhance transparency, reduce operational inefficiencies, and improve Return on Assets.
- iii. The Central Bank of Nigeria and other financial regulatory authorities should develop supportive regulatory frameworks and policies that encourage the adoption of blockchain accounting practices within the Nigerian banking sector.
- iv. Banks should organize regular training and capacity-building programmes for accounting and information technology personnel to improve their knowledge and effective utilization of blockchain accounting systems.
- v. Deposit money banks should continuously upgrade their digital infrastructure and cybersecurity mechanisms to ensure the effective implementation and sustainability of blockchain accounting technologies.

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