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The Effects of Blockchain Technology on Corporate Governance: Evidence from Emerging Economy

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Abstract: Modern developments in digitization have completely changed business structures and operating procedures. The core structure of a database can be built using the distributed technology known as blockchain, which combines data blocks and hash chains. Blockchain has been recommended by academics as one of the foundational elements of corporate governance. Though previous studies examined the impact of blockchain on firm numerous extents, few study has investigated the impact of blockchain technology on corporate governance. We examined the effects of blockchain technology on corporate governance of financial institutions in Nigeria. We use multiple regression over 121 responses. Samples were collected using a random sampling method. Results indicates that blockchain technology has positive impact on corporate governance suggesting the removal of agents as intermediaries in corporate governance through code, peers' connectivity, and collaboration. Our results help managers transform the regulatory, financial, and entire governance structure of financial institutions.

Keywords: corporate governance; blockchain; technology; Nigeria.

Introduction

Many companies and organizations have been coming up with strategies that would allow them to safeguard the massive amount of transactions and enormous data they generate. Important tools and technology for managing business processes and methods of data distribution in an organization have been introduced because of the current digitalization. Blockchain technology as one of the disrupting fintech, uses distributed ledger technology to prevent fraud and hacking and transform the way data is transferred (Tapscott, 2017). Blockchain technology is a distributed ledger that distributes all network transactions across its users. Only a strong corporate governance framework will enable widespread adoption of blockchain, which has the features to ensure data security, transaction speed and transparency, and user trust.

By 2024, it is expected that the blockchain technology market would be worth $7.59 billion USD which equates to a 37.4% yearly growth rate. This expanding trend resulted from the already high demand for financial and public services, as well as for transportation and communication (Ronaghi, 2022). Cost-effectiveness, increased profitability, an easy-to-use information recording system, smart digital contracts with a worldwide online identity system, the creation of a secure digital platform, and better monitoring are just a few of the advantages of blockchain (Garg et al., 2020). By fostering transparency and fixity, blockchain technology improves organizational activity control.

Corporate governance refers to the management of organizational executive agents' behavior for the benefit of shareholders. The concept of corporate governance encompasses more than only the interactions between shareholders, management, and investors. Additionally, blockchain regulates the distribution and allocation of business resources and activities (Al-ahdal et al., 2020; Ronaghi, 2022). It is crucial for the firm's stakeholders to identify the key components of the corporate governance framework. According to Singh et al. (2020), blockchain technology may have an impact on the

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organization's corporate governance parameters. Furthermore, Ronaghi (2022) found positive effect of blockchain on corporate governance and corporate performance of Iranian firms. This suggests that blockchain technology may make it easier to do away with agents who act as middlemen in corporate governance through connectivity, crowdsourcing, and cooperation. Although the previous studies have examined the impact of blockchain on firm numerous extents, few study was found to highlight the impact of blockchain technology on corporate governance. Moreover, studies of blockchain technology on financial institutions are missing in the literature, hence more studies are needed to empirically examine the effects of blockchain technology on corporate governance of financial institutions in Nigeria.

The Nigeria economy is interesting to explore based on the following reasons. The Nigerian government is collaborating with the fintech sector to enable the adoption of distributed-ledger technology in the financial markets as blockchain technology gains traction across the continent. Nigeria, Africa's most populous country, launched the eNaira, a digital currency, last year in order to increase financial inclusion.

The research enriches the body of knowledge on the following topics. To begin, the study is first to empirically investigate how blockchain technology impacts corporate governance in Nigeria, an African emerging country. Furthermore, a questionnaire is developed to measure corporate governance and blockchain technology nexus using descriptive statistics analysis with respondents from financial services firms. Finally, the findings of this study might be applicable to managers of businesses on the continent.

The rest of the paper is built as follows. The next section reviews theoretical background, developed hypothesis, followed by research model. Section 3 presents research methodology. The fourth section reports findings and discussions. The final section concludes and provides policy recommendations.

Theoretical background

Blockchain technology

Blockchains was proposed in 2008 by Nakamoto as a way of authenticating the ownership of bitcoin virtual currency. Blockchain technology is frequently distinct as a platform used to execute cryptocurrencies, smart contracts and essentials of finance, supply chain management and marketing (Ahluwalia et al., 2020; Ma et al., 2020).

Cong and He (2019) described block chain as a distributed and disseminated ledger technology, classically managed in a decentralized pattern. Blockchain, being a distributed ledger technology, has been found as a better replacement for the traditional double entry bookkeeping in a general ledger of a firm's financial records (Yermack, 2017).

Since its emergence, blockchain has been a facilitating change in smart contracts execution, cryptocurrencies and is presently being introduced into the structure of the foremost organizations' corporate governance (Ahluwalia et al., 2020; Gill et al., 2019; Yermack, 2017). According to Yermack (2017) blockchain tends to provide solution to the main issues facing the corporate governance structure of many institutions. Prior studies indicate inconclusive results of fraud detection and prevention related to corporate governance (Chen et al., 2018; Liu et al., 2021). This empowered the need for firms to sustain their market niche with emphasis on transparency, security of data, speed, and cost reduction. Hence, the adoption of blockchain technology was emphasized to grant these desires.

In Africa, Blockchain technology has received recognition. Blockchain will replace traditional way of doing transaction, help to minimize fraud and captures the business environment in Africa (Akgiray, 2019). The potential of blockchain has not been

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extensively explored in the African context of business (Frizzo-Barker et al., 2020) and, like every other innovation that is introduced to any firm for acceptance, there is supposed to be certain level of acceptance within the firm for full adoption (Caviggioli et al., 2020).

Especially in private companies, blockchain can transform the corporate governance of firms by making all the transactions transparent (Kaal, 2021). When all data is completely stored up on the blockchain, organizations will not need to manually update their shares and/or notify their shareholders every time a new transaction is performed (Tapscott & Tapscott, 2017).

Blockchain is used to transform business globally across different industries, built more trust that has led to more efficiency by eradicating replication of effort and third parties' intermediaries, most especially in the financial service industry, the supply and logistics companies, health sector, retail and even in public sector. Blockchain technology gives a unique system of trading and trailing financial assets ownership (Marbouh et al., 2020). Scholars reckoned that Global Stock exchanges firms have started the experimentation of blockchain technology as a system for firms to vote, list and trade shares and, benefiting from reduced trading costs, quicker ownership transfers of stocks, correct records, and better transparency of the full process (Fenwick & Vermeulen, 2019; Singh et al., 2019; Yermack, 2017).

Blockchain has come to replace the traditional century's long double-entry bookkeeping of financial records (Carlin, 2019). The corporate governance of financial institutions would transform in numerous ways under the regime of blockchain (Yermack, 2017). For example, futuristic and financial investors could take the opportunity to buy a firm share at a reduced cost and sell it with profit on the market with large liquidity. Moreover, managers who have gotten incentives from a compensation that is stock based will lose opportunities for profit legally from an insider trading, because of the huge visibility of all their business transactions.

Blockchains can also deprived most managers from the opportunities to backdate compensation awards or stealthily pledge shares for derived transactions. (Fosso Wamba et al., 2020), as voting made by Shareholders will become more trustworthy and less costly (Schuh & Larimer, 2015; Yermack, 2017). Blockchain is used by firms for real-time accounting, decreasing the need of audit for the firms, and for the implementation of smart contracts, which will decrease the estimated costs of distress financially and diminish litigation need (Yermack, 2017). Therefore, these changes can intensely alter the relative power of managers, regulators, lenders, shareholders, and third-party professionals that interact in the corporate governance arena.

Despite its many benefits, blockchain faces several difficulties. According to Drescher (2017), the openness and absence of any sort of central control are performance criteria for blockchain that can limit its acceptability. Andolfatto (2018) asserts that a lack of user recognition is the main non-professional obstacle to the adoption of blockchain. The four categories of blockchain obstacles are financial, operational, legal, and adoption challenges, according to Ali et al. (2020). What was mentioned suggested that blockchain technology is more than just a platform for digital currency, and considering its capabilities, it has the potential to impact information transfer, communication, activity monitoring and control, and power structure.

Corporate governance

The disparity of interest of shareholders and that of managers' make corporate governance relevance more present in modern firms because of the separation of ownership control and business management. The most important agent problem is reflected in the management and its related problems due to the different interests of firm's stakeholders. Arslan and Alqatan (2020) described corporate governance as a structure that influences organizational processes, together with the person(s) appointing

the controllers and regulators of all operational processes within and outside of the organization. Moreover, Mohan and Chandramohan (2018) pointed that corporate governance is the coordination of a of set rules, process, and practices based on which an organizations is being controlled.

Corporate governance, from the perspective of Vieira et al. (2021), involves balancing the interests of a company's many stakeholders, such as shareholders, senior management executives, customers, suppliers, financiers, the government, and the community.

According to Amoako (2017), corporate governance embraces all types of organizations, from the ones which are incorporated under civil law, to the ones which can operate under common law or civil law, limited liability partnership, building societies, partnerships, joint ventures, trading trusts limited liability partnerships, co-operatives, mutual associations, friendly societies. Similarly, Anand (2019) believed that organizations may be publicly traded and privately held for profit, or not -profit because, as literatures on corporate governance implicitly assumes, only publicly traded firms are the subject of analysis. For example, studies contended that nonprofit organizations ,such as churches that does not indulge in production or any sales of goods or/and services, do not literally meet the acceptable standard of what an organization should look like (Hamad et al., 2020; Paniagua et al., 2018).

Similarly, corporate governance core purpose is to expedite efficient, effective, innovative, and discreet management style that can convey the overall achievement and objectives of the company (Malecki, 2018), also together with building an equilibrium amongst social goals and economic targets. This could be a real challenge for an organization due to the various interests of the stakeholders.

Corporate governance is technically a combine sets of laws, policies and procedures through which a firm is being governed, controlled and regulated. Focusing on protecting the interest of their stakeholders, a firm has to ensure that their data is secured and free from theft or the danger of being hacked, thus cybersecurity helps a firm in protecting systems, programs, networks, data and transactions from any kind of digital attacks. Therefore, in other to enhance the cybersecurity of a firm, it is of great importance for firm management to introduce a technology that will strengthens cybersecurity hence adopting blockchain into corporate governance structure of a firm will not only tighten the security of the firms' data, but it will also ease transactions and straightens their records as it has been tested to be efficient in cryptocurrencies transactions (Ahluwalia et al., 2020; Anand, 2019; Chang et al., 2020; Gill et al., 2019; Nadikattu, 2020).

Blockchain technology and corporate governance

The corporate governance plays an important role in creation of transparency and openness in an organization (Al-ahdal et al., 2020). Provided its legitimacy, responsiveness and competency in the policymaking field, corporate governance is defined by observance of law and human rights at the same time (Srivastava, 2009). Under the conditions that conflicts are increased, corporate governance has a critical role. The corporate governance includes internal and external mechanisms, which reduce conflicts caused by separation of ownership from control (Ronaghi, 2022). These mechanisms guarantee capital return for the stakeholders and expropriation by insiders (LaPorta et al., 2000).

Singh et al. (2020) showed that, through creating transparency, increasing liquidity, and decreasing costs, blockchain technology would improve the whole aspects of organizational governance; thus, the entire groups of stakeholders of the company, including customers, might enjoy the advantages of deploying blockchain technology. According to the results, different aspects of blockchain technology were accepted among the financial market stakeholders. For example, Derbali et al. (2019) observed how blockchain affected corporate governance using smart contracts and creating

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Decentralized Autonomous Organization. Such organizations there is no predefined hierarchy, and the organization is focused on business core (Barrett et al, 2016). Hence, governance structure would change in such organizations.

The blockchain technology presents a new strategy for designing a governance model based on smart contracts and trust management. The smart contracts are computer protocols written among buyers and vendors within lines of code; and are placed in blockchain decentralized network. Blockchain deletes fraudulent transactions and provides the integrity of principal agent relationships (Kaal, 2020). Blockchain and smart contract reduce organization's costs. Akgiray (2019) believed corporate governance goals can be a useful guide to re-understanding financial regulations and revising public policies to comply with blockchain technology.

Aside from Ronaghi (2022), who found positive impact of blockchain on corporate governance of SMEs in Iran, more empirical research is needed as studies related are more theoretical. Therefore, we close this significant gap and explore the understanding of the effect of blockchain on the corporate governance. Accordingly, we propose that:
H1: Blockchain technology has positive impact on corporate governance.

The research model that drives the analysis in this study is based on the empirical review above and agency theory. Therefore, the explanatory variable is corporate governance, and dependent variable is blockchain technology adoption, which form the basis of the empirical analysis of the research. The research model for this study is presented in the figure below:

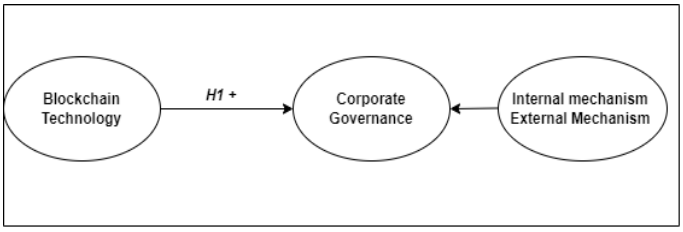

Figure 1. Research Model
Source: built by the author

Methodology

We quantitatively measured variables based on collecting data from managers of sampled financial institutions from Nigeria. The quantitative method produced excellent results with standard questions standard which were interpreted in same way for all participants (Burns and Burns 2008). We used random sampling technique to sample managers with structured questionnaires from December 2021 to March 2022.

Managers of financial institutions were selected based on their experience, trainings, and knowledge on the adoption of blockchain technology on corporate governance. We approached respondents which their firms have adopted blockchain and personally have experience on the attributes, benefits, and challenges of the blockchain technology. However, we believed that financial institution would benefit from the adoption blockchain technology into their corporate governance structure.

The designed questionnaire consisted of three parts. The first part included a cover letter to explain the constructs and the purpose of the research to the participants along with five demographic questions. The remaining part was related to blockchain technology adoption (seven items) and corporate governance (thirteen items) questions which were self-developed. We built the questionnaires and confirmed them according to the opinion of experts in the field of management and fintech, particularly blockchain technology. We measured the questionnaires on 5 Likert scale ranging from 1 strongly disagree to 5

Strongly agree. Therefore, we sent the questionnaires to the respondents through emails, WhatsApp, and LinkedIn.

Data analysis

We used multiple regression to estimate the data obtained using the SPSS version 23. Out of 320 questionnaires distributed to respondents, we received 125 responses. We included 121 responses after taking out the incomplete response representing 38%. Out of 121 responses, 73.65% were males, leaving the remaining of 26.4% as females. Over 50% of respondents have more than ten years' experience in banking and most of the respondents (90.1%) work in the private sector of financial institutions. 87.6% of respondents have post graduate degree and 12.4% are graduate. Table 1 below reports the summary of respondent's profile.

Table 1. Respondents profile

Description	Profile	Frequency	Percentage (%)
Gender	Male	89	73.6
	Female	32	26.4
Age	18 – 25 years	12	9.9
	26 - 35years	49	40.5
	36 – 50 years	60	49.6
Education	Graduate	15	12.4
	Postgraduate	106	87.6
Working Experience	1– 5 years	14	11.6
	6 – 10 years	43	35.5
	Above 10 years	64	52.9
Sector	Private	109	90.1
	Public	12	9.9

Source: own processing

Validity and reliability test

We test the validity and internal consistencies of all items of the constructs to ensure unidirectional reliability. First, we assessed the sample fitness of the data using the Kaiser Meyer Olkin which revealed 0.710 which is higher than the minimum threshold of 0.6 for sample adequacy (Hair et al., 2010). Table 2 presents validity and reliability of the variable constructs. Factor loading reveals the variance that explained by the variable on that factor with the threshold 0.5 or higher. Results evidence that all factor loadings for all constructs exceeds the threshold of 0.5. For example, factor loadings for blockchain are from 0.713 to 0.874. This indicates the validity of constructs (Thorndike, 1987).

However, Cronbach Alpha for all constructs exceeded the threshold 0.7. This indicates the acceptance of internal reliability of the study (Daud et al., 2018; Hulin et al., 2001; Pallant, 2020). Moreover, composite reliability was above the 0.8 threshold which confirms the convergent reliability of constructs. However, average variance estimates (AVE) values were 0.55 (blockchain technology) and 0.65 (corporate governance) which were greater than 0.5 acceptability limit. This indicates that the variations recorded by the questionnaire items were substantially greater than the changes caused by measurement error (Raykov, 2012).

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Table 2. Validity and Reliability Test

Constructs	Items	Loadings	Cronbach Alpha
Blockchain Technology Adoption AVE=0.630, CR=0.922	BC1	0.772	0.748
	BC2	0.855	
	BC3	0.726	
	BC4	0.874	
	BC5	0.787	
	BC6	0.818	
	BC7	0.713	
Corporate Governance AVE=0.607, CR=0.952	CG1	0.719	0.794
	CG2	0.772	
	CG3	0.879	
	CG4	0.883	
	CG5	0.705	
	CG6	0.783	
	CG7	0.784	
	CG8	0.843	
	CG9	0.765	
	CG10	0.724	
	CG11	0.739	
	CG12	0.792	
	CG13	0.716	

Source: own processing

Table 2 presents validity and reliability results. BC represents blockchain, CG, corporate governance, FL is factor loading and CA is Cronbach Alpha respectively.

Table 3. Descriptive and Discriminant Results

	CA	AVE	Corporate Governance	Blockchain Technology
Corporate Governance	0.748	0.607	0.779	
Blockchain Technology	0.794	0.630	0.582	0.793
Mean			6.122	5.292
Std. Dev			0.266	0.204

Source: own processing

From the table, CA represent Cronbach Alpha, AVE, Average Variance Estimates, and std. Dev is standard deviation

Table 3 shows that correlations between constructs remained 0.582. We believed that correlations between variables bigger than 0.90 may suggest a common method bias. The relationship of our study is less than 0.90. As a result, we contemplate if multiple regression is suitable for the research model. To further assess discriminant validity, we used the Fornell and Larker AVE metric.

For the model to achieve the criteria for discriminant validity, the average variance estimates square root of the latent variable should be bigger than the correlations across all model dimensions. The AVE square root for all constructs *(diagonal of Table 3)* is higher than their correlations (Table 3). Hence, a discriminant validity was found between the two constructs. However, all AVE square roots were larger than correlations among all variables (*evidence in Table 3*). Henceforth, the study accepts discriminant validity.

Results and discussions

We examined the effect of blockchain technology adoption on corporate governance of financial institutions in Nigeria. We used multiple regression estimates to test the hypothesis due to the limited number of data sets (Eckstein et al., 2015).

Table 4 reports estimations highlight and empirical evidence from used regression model. Results indicate that blockchain technology has positive and significant effect on corporate governance.

Table 4. Empirical Results

Hypothesis	Estimate	Std. Err	t- statistics	P-value	Supported
BTA→CG	0.242	0.040	6.122	0.000	Yes
Adjusted R-square	0.52				

Source: own processing

The positive impact suggests that blockchain technology adoption will significantly improve corporate governance mechanism of firms by about 0.553%. The results are in line with the agency theory that, blockchain-based technology will offer alternatives to existing corporate governance solutions. Blockchain technology could facilitate the removal of agents as intermediaries in corporate governance through code, peer to peer connectivity, crowds, and collaboration. Moreover, the results validate Yermack (2017) suggestion that blockchain adoption in corporate governance would result in greater liquidity, lower costs, accurate record keeping and transparency in stock transfer and ownership.

However, the result is novel and contributes to blockchain and corporate governance literature as studies examined were mainly theoretical (Akaba, 2019; Jimoh et al., 2019; Oye-Bamgbose, 2019). Moreover, R^2 coefficients show that the model was able to explain 52% of the variance in corporate governance.

Given the important capabilities of blockchain technology, research revealed that adoption of blockchain influences corporate governance. Blockchain affects the corporate governance mechanism by eliminating intermediaries, information invariance, and creating transparency (Derbali et al., 2019). Therefore, blockchain can be introduced as one of the factors affecting the regulatory and controlling mechanism of a start-up company.

Conclusions

The main aim of the study was to close an essential gap in the literature regarding the impact of corporate governance on blockchain technology adoption. The study sampled participants from Nigeria, an African emerging country. The results indicate that blockchain technology has significant and positive impact on corporate governance. One of the unique contributions of this study is creating fascinating and important insights about the empirical impact of blockchain on corporate governance using financial institutions from African economy. The empirical conclusion is ground-breaking, and it shows that adopting of the blockchain technology has the potential to improve regulatory systems, create transparency, enable the identification and prevention of data manipulation, and provide a better framework for good corporate governance. Moreover, it could transform the regulatory, financial, and entire governance structure of financial institutions in Nigeria. Therefore, without the structure of corporate governance in place, financial institutions cannot adopt or implement this innovation in their organization.

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Implications for theory

We find positive impact of blockchain technology on corporate governance. Data decentralization specifically results in power equality at various organizational levels and prevents official corruption from happening. Blockchain has the potential to improve an organization's decentralization, cost-effectiveness, and accuracy (Abadi & Brunnermeier, 2018). Blockchain's confusion roles can eliminate barriers in agency relations that call for agent control (Kaal, 2020).

Management and other relevant stakeholders can more effectively supervise the performance of employees and executive agents considering the possibility for digital product tracking and its ability for immutability. The groundwork for effective corporate governance is therefore ironed out. Nigeria had a score of 24 in the Corruption Perception Index in 2022, which is a low-slung score, according to statistics provided by Transparency International. Therefore, a poor corporate governance may have influence on the administrative corruption. Regarding how blockchain technology affects corporate governance, it is advised that stakeholders and board members in financial institutions use this technology to enhance control over organizational performance.

According to our findings, the connection amid corporate governance and blockchain will have an impact on business performance. Hence, financial institutions should be aware of regulatory procedures and management performance monitoring tools to achieve good performance through blockchain technology adoption.

Implications for practice

The findings of this study demonstrated how corporate governance in Nigeria's financial sectors is impacted by the adoption of blockchain technology. As a result, the financial institution's managers can employ blockchain technology to support stakeholders' objectives and ensure a better regulatory system. Due to Nigeria's legal acceptance of digital currency and its decentralized nature in financial transactions, organizations may use it despite international restrictions. Therefore, Nigerian economic policymakers and business managers should anticipate greater corporate governance and appropriate contact with stakeholders by improving organizational infrastructures and sustain potential for blockchain technology adoption.

Limitations and future research

There are a few limitations that engulfed the study. Firstly, Blockchain technology could impact ethics and sustainability of firms, however, we examined the effects of blockchain technology on corporate governance. Therefore, there is room for further studies to consider and look at the effect of blockchain on the dimensions of sustainability and ethics in financial institutions.

Secondly, the study examined from only Nigeria as an emerging economy, hence generalization could not be applied to all emerging countries in Africa. Therefore, further studies could explore other emerging countries from the continent, especially from other West African nations, as well as from Eastern and Southern Africa. Moreover, this research was conducted in Nigerian financial institutions, therefore future studies are recommended to test the study model from other sectors including SMEs and manufacturing sectors.

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