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Spectrum of Adoption of Blockchain Technology: Implications for Emerging Capital Markets in Africa

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Abstract
The capital market is instrumental to the economic development process of African states. A key enabler of such development is the use of emerging technologies such as blockchain technology and its transformative role in driving an efficient market. As the conversation on the prospect of adoption begins to gain traction in this region, an important point of discussion is the extent to which the technology would disintermediate the market. This is a focal point of discussion given the unique configuration of traditional capital markets and the properties of the technology. Evidence from various simulations and regulatory sandboxes on the application of blockchain technology across the globe shows that existing market institutions will remain key players in a blockchain-operated capital market. This model creates tension for African capital markets given the institutional frailties in the region. Using Nigeria as a principal case study, this article discusses the implications of the technology with a key focus on governance, custody of assets and enforcement mechanisms. Grounded on Douglass North institutional theory, this article argues that trust and accountability by market institutions, underscored by a strong enforcement mechanism, are required to effectively realise the impact of the technology. This article makes key recommendations to address the tension surrounding the implications discussed by creating a balance between innovation and systemic stability in the region's capital market.

Keywords: *Blockchain, Capital Markets, Regulatory Framework, Intermediaries, Custody, Governance*

JEL Classifications: *K22, Z33*

1. Introduction

Capital markets are instrumental to Africa's economic growth process [1]. It offers a veritable platform to effectively mobilise capital, drive investment, foster innovation and reduce poverty in the region [2]. However, the ability of its markets to achieve such objectives is constrained by a number of inefficiencies, such as high transaction costs, protracted settlement cycles, limited accessibility, low liquidity levels, poor governance practice, ineffective market oversight, amongst others. Against this backdrop, emerging technologies like blockchain have been touted as a revolutionary tool that offers transformative capabilities to reshape Africa's capital markets through decentralisation, enhanced transparency and operational efficiency [3]. The technology further has the potential to promote financial inclusion and broaden investors' participation through features like tokenisation of assets and fractional ownership [4]. However, the promise of this technology is confronted with a stark reality of institutional fragility in the region's capital markets, where there are concerns of weak governance, inadequate investor protections and systemic accountability deficits. This tension reflects the paradox on the spectrum of blockchain applications in capital markets. While blockchain's decentralised design ostensibly seeks to circumvent untrustworthy intermediaries, its implementation in practice requires collaboration with key market institutions that have been accused of transparency and accountability deficits. This issue lies at the heart of Africa's blockchain dilemma.

In light of this issue, the article seeks to address two key questions. First, it seeks to determine the potential implications of blockchain technology adoption in capital markets within the region, given the existential issues of institutional frailties. Second, the article examines whether the adoption of blockchain technology can overcome existing institutional weaknesses or if it will simply digitise these flaws without significant transformation.

To answer these fundamental questions, this article uses the Nigerian capital market as a case study to examine the implications on governance, custody of assets and enforcement mechanisms. The justification of its use stems from a number of reasons. On one hand is the broad intent of the country to adopt blockchain technology in its public sector as captured under its National Blockchain policy [5]. More specifically, is the current aspiration of the apex market regulator – Nigerian Securities and Exchange Commission (SEC) – to adopt the technology to drive market efficiency.

On the other hand, cases such as *Bonkolans Investment Ltd & Ors V. Central Securities Clearing System Ltd* & Ors [6] which involved

collusion amongst key market institutions in the fraudulent sale of investors assets, to the litany of cases bothering on lack of transparency and accountability by financial institutions regarding the management of customer funds/assets evidences the lingering concern of custodial vulnerabilities and underscore systemic governance failures in the sector [7, 8]. These incidents reflect a broader pattern across the African market, such as regulatory inertia, opacity amongst intermediaries and inadequate redress mechanisms for retail investors [9]. The country, therefore, embodies both the aspirations and challenges of blockchain adoption in its capital market.

While existing scholarship has extensively analysed blockchain's impact in advanced markets [10, 11], its implications for emerging markets, particularly in Africa, where institutional capacity and regulatory maturity differ starkly, remain underexplored [12]. The research aims to enrich the broader conversation on blockchain technology's potential impact on capital markets by analysing the implications of blockchain adoption in African capital markets and proposing tailored recommendations for navigating these challenges.

This article argues that blockchain alone cannot resolve systemic accountability gaps. While the technology offers tools to enhance auditability and reduce intermediation risks, its success hinges on institutional willingness to adopt open protocols, enforce compliance and prioritise public oversight. Without structural reforms to governance frameworks, blockchain risks becoming a veneer of innovation with the risk of amplifying systemic vulnerabilities rather than mitigating them.

The interrogation of Nigeria's regulatory landscape and historical governance failures in this study, therefore, seeks to challenge the deterministic narratives of blockchain as a panacea. It calls for a reimagination of market infrastructure – one that pairs technological disruption with institutional accountability. The findings aim to guide policymakers, regulators and market operators in balancing innovation with stability by ensuring that blockchain's adoption strengthens, rather than undermines, the fragile trust underpinning Africa's capital markets.

Objectives of the study

This article seeks to:

i. Analyse the governance tensions arising from blockchain's decentralisation in markets with historically low institutional trust.

ii. Assess the implications of blockchain adoption for the custody of investor assets and enforcement mechanisms in emerging capital markets.

iii. Evaluate the practical challenges and opportunities of blockchain integration through case studies drawn from the Nigerian financial market.

iv. Propose methods for balancing technological innovation with regulatory oversight in emerging markets.

2. Methodology

This study employs a mixed-methods research design by integrating primary and secondary data sources to analyse the institutional challenges of blockchain adoption in Nigeria's capital markets. The methodology is grounded on Douglass North's institutional theory [13], which posits that economic progress depends on strong institutions. Below, I outline the primary and secondary data sources, their application and their synthesis.

A. Primary data sources

Primary insights were drawn using a combination of semi-structured interviews and a questionnaire with 10 stakeholders across Nigeria's financial ecosystem. Participants like the regulator, market intermediaries, fintechs and academics were selected via purposive sampling (targeting roles that would provide relevant insight on blockchain integration) and snowball sampling [14]. This approach ensured representation of diverse perspectives on blockchain's governance, custodial risks and market enforcement.

TABLE 1: Participants' descriptors.

Participant	Role/Experience	Key Insights
3 Legal & Compliance Officers	Nigerian commercial banks (10+ years' experience)	Highlighted transparency gaps in customer deposit reconciliation and weak enforcement of banking regulations.
1 Director	Lagos-based fintech firm (10+ years' experience)	Emphasised fintech's role in addressing traditional banks' opacity.
1 Judge	Specialised capital market tribunal (20+ years' experience)	Cited cases like *CSCS & Anor v. Bonkolans Investment Ltd* to illustrate institutional fragility.
1 Senior Executive	Nigerian capital market regulator	Acknowledged blockchain's potential but stressed capacity gaps in the Nigerian capital market.
1 Senior Executive	Nigerian capital market intermediary	Underscored the ineliminable role of intermediaries in blockchain operation, particularly in the derivatives market.
1 Professor of Law	UK-based University (+15 years' experience)	Highlighted the accountability deficits in emerging markets and emphasised the role of strong institutions towards a successful adoption of blockchain technology.
2 FinTech Researchers	UK-based Universities (+4 years' experience)	Noted the adaptability of blockchain to different sectors and its relevance in capital markets in Africa.

Interviews were transcribed and analysed using thematic coding to identify patterns such as "regulatory inertia," "institutional mistrust" and "capacity building."

B. Secondary data sources

The work relied on case laws delivered by the Nigerian courts and events that demonstrated the enforcement delays and institutional weaknesses in the Nigerian capital market. There is also reliance on simulations and regulatory sandboxes on blockchain applications in capital markets.

Key positions on blockchain implementation were also drawn from academic literature on the subject matter and policy documents of organisations involved in blockchain research.

C. Synthesis and summary of findings

i. Triangulation of findings

- *Primary Data*: Interviews revealed systemic issues, such as enforcement laxity by regulators and accountability gaps by market institutions.
- *Secondary Data*: Blockchain projects showed the ineliminable role of market intermediaries in performing governance and custodial functions in a blockchain-operated capital market. Also, case laws showed accountability gaps and enforcement inertia.

D. Limitations

- *Sampling Bias*: Reliance on Nigerian participants may overlook regional variations in blockchain readiness.

3. Blockchain technology and its application in capital markets

Blockchain is a decentralised, distributed ledger technology (DLT) that enables secure, transparent and tamper-proof record-keeping. Its core features, such as decentralisation, cryptographic security, immutability and consensus mechanism, allow multiple parties to transact and share data without relying on a central authority [15].

Blockchain can be categorised into two forms. These are permissioned and permissionless blockchain. The classification is primarily based on their accessibility, governance and control features [16]. Permissionless blockchain, on the one hand, is popular for the issuance of cryptocurrencies such as Bitcoin and other digital currencies. Their ledger is open source and permits anyone to publish a block without requiring the permission of any authority [16]. Permissioned blockchain, on the other hand, is controlled, and governance is usually placed in some authority. Users must be granted permission and authority to publish blocks before they can do so. The controlling authority can give permission or restrict access to nodes to read the blockchain [16].

The diverse applicability of blockchain in various sectors, and more particularly, its value propositions in driving an efficient capital market, has gained the attention of policymakers and industry players across the globe, especially in emerging markets in Africa.

4. Blockchain potential in capital markets [17–19]

A. Enable greater operational efficiency

Blockchain has the capability to enhance and automate current market processes by resulting in accelerated settlement times (T+3 to T+0), more effective reconciliation processes and expedited handling of corporate actions such as coupon or dividend payments.

B. Reduce risk

Blockchain technology can enable faster and immediate settlement of transactions with complete certainty. This is because of the tamper proof and secured nature of the ledger which makes it difficult for transactions recorded to be altered without the knowledge of other participants in the network. This arrangement enables transactions to be secured and transparent.

C. Improve transparency and traceability of transactions:

Blockchain technology can significantly improve information sharing and synchronisation amongst market participants. This could potentially enhance the transparency of financial market activities for both market participants and regulators by providing real-time access to market data.

D. Improve liquidity

Blockchain technology provides the opportunity to enhance liquidity through tokenisation of assets – representing assets as blockchain-based digital tokens. This feature enables the tokenised asset to be fractionalised thereby opening investment opportunities to retail investors and thus increasing the pool of buyers/sellers.

5. Challenges of blockchain adoption in capital markets

The adoption of blockchain technology in capital markets is accompanied by a complex array of challenges, as underscored by a recent OECD report examining critical pilot initiatives [20]. Amongst the foremost hurdles is the misalignment between existing securities laws and the novel characteristics of blockchain regarding issues such as asset ownership and settlement finality which demand regulatory modernisation to ensure compliance and legal clarity.

Implementation costs further complicate adoption as transitioning to blockchain infrastructure necessitates substantial investments in technology upgrades, workforce retraining and systemic overhauls, which can be prohibitive for smaller institutions.

Also, technical barriers persist, particularly the interoperability gaps between legacy financial systems and blockchain networks which is exacerbated by the proliferation of competing distributed ledger technology (DLT) platforms that lack standardised protocols. These siloed architectures hinder seamless integration and data sharing and undermine blockchain's promise of efficiency.

Furthermore, infrastructure gaps loom large. The absence of integrated digital payment rails (e.g., wholesale central bank digital currencies) and scalable digital identification solutions, both critical for secure, frictionless transactions.

6. Spectrum of blockchain adoption models in capital markets

The quest to adopt blockchain technology in capital markets has generated critical debates about the appropriate model of implementation, given its disruptive potential of the technology and the unique configuration of capital markets. These debates revolve around two extreme models [21].

A. Complete disintermediation (Radical Model)

At one extreme, this model envisions a fully decentralised market where issuers and investors transact directly on a blockchain, thereby eliminating intermediaries. While theoretically appealing in terms of reducing costs, accelerating settlements and democratising access, usage of this model in the traditional capital market appears unrealistic [18].

A number of plausible reasons can be attributed to this scepticism. First, the unique arrangement of capital markets requires some form of intermediary to manage certain risks. A complete disintermediation could trigger operational risk where liability is shifted to untested smart contracts and decentralised autonomous organisations (DAOs) which could raise accountability gaps [18].

Furthermore, in capital markets, intermediaries traditionally perform three core functions: verification and compliance, data management and safeguarding. First, they confirm the existence and characteristics of assets, verify the identities of transacting parties and ensure adherence to legal and regulatory requirements. Second, they record transactional data, reconcile discrepancies and maintain records. Third, they safeguard assets and transactions against risks like fraud (e.g., double-spending) while resolving disputes and enforcing investor rights [18].

While blockchain can practically disrupt every aspect of these functions by taking on these roles, intermediaries remain critical for functions like asset custody (e.g., securing digital keys or physical assets) and dispute resolution. Legal frameworks and human oversight are still essential to enforce investor rights, mediate conflicts and manage scenarios where automated systems fall short. Therefore, while blockchain reduces reliance on intermediaries for transactional and administrative tasks, their expertise in asset protection, legal enforcement and complex problem-solving ensures their enduring role in modernising, and not fully replacing, market infrastructure [18].

B. Interoperability with legacy systems (Realistic model)

The model envisions that current centralised market intermediaries will continue to operate, however, the technology and its embedded feature – smart contracts – will help to drive innovation.

This is a model that appears to be popular across the various simulations, live projects and regulatory sandboxes across the globe [17, 18, 22]. This model dominates due to a number of interrelated factors. First, regulatory comfort drives its adoption. Authorities prioritise controlled experimentation over disruptive overhauls. For instance, the EU's DLT Pilot Regime permits blockchain integration for specific securities while operating within established market rules [23]. This ensures that innovation aligns with existing legal guardrails.

The second reason can be attributed to the risk mitigation role that central intermediaries play [18]. Intermediaries such as custodians, exchanges and banks in their varied function provide indispensable safeguards, mitigating settlement failures, cyber threats and operational vulnerabilities inherent in purely decentralised systems.

Finally, market realism tempers expectations of a radical change. The reality is that a fully disintermediated market would require rewriting foundational legal frameworks such as property rights, insolvency laws and investor protections. This is an arduous task that is both politically contentious and technically complex.

It should be noted that while central intermediaries' role remains important, proof of concepts (POCs) like Project Khokha 2 have shown that some of the diverse and duplicative roles in the current market arrangement can be performed by the blockchain [19].

7. Position of blockchain technology in the Nigerian capital market

The Nigerian capital market has not developed a framework for the adoption of the technology in its market. However, it is one of the few markets across the region that has implicitly recognised the role of blockchain technology in the issuance of security tokens by decentralised private exchanges/ virtual assets providers. This was made evident through the creation of its rules on issuance, offering platforms and custody of digital assets [24].

This move mirrors its growing interest in the technology and is further strengthened by a recent statement credited to the Nigerian SEC on how the adoption of the technology in its market can drive efficiency and enable financial inclusion [25].

This aspiration could be linked to the country's National Blockchain Policy [26] and its capital market master plan [27].

Understanding the implications of the technology on key aspects such as governance, custody of asset and enforcement mechanisms is an important discussion given the role that market institutions would play in a blockchain-operated capital market.

8. Governance implications of blockchain adoption in Nigeria's capital market

The quest to integrate blockchain technology into Nigeria's capital market presents a pivotal yet complex governance challenge, particularly in navigating the tension between decentralisation and centralised control. Unlike permissionless systems which prioritise decentralisation and anonymity, permissioned ledgers grant control to centralised institutions to validate transactions, manage access and enforce compliance. However, this model entrenches power in existing market institutions.

This foregoing arrangement appears to be apparent from the various simulations and regulatory sandboxes established across the globe. For instance, in Project Helvetia, governance of the blockchain with respect to the settlement, trading and custody of assets was done by the SDX infrastructure using various subsidiary entities such as the SDX Trading AG and SIX Digital Exchange AG [28]. Similarly, regulatory sandboxes like the EU DLT scheme [23] and the UK Digital Securities Sandbox [29] envisage such an approach, which tends to reflect a cautious approach to adopting innovative technologies.

Interestingly, Project Khokha 2, which is the first POC in Africa and pioneered by the South African Reserve Board (SARB), also offers similar cautionary approach in the use of DLT in capital markets. However, while the project demonstrated blockchain's potential to disrupt the chain of market infrastructures involved in financial market trades, governance remained centralised under SARB and a consortium of existing market institutions under the supervisory umbrella of Khokha hub – a DLT-based token trading platform (TTP) [19].

While this hybrid approach gives a sense of direction for other emerging capital markets in the region seeking to explore such technology, the argument here is that such arrangement still creates tension for markets like Nigeria since governance roles would be placed in key market institutions that has arguably been plagued by accountability gaps, cybersecurity vulnerabilities and regulatory inertia. The infamous *CSCS & Anor v. Bonkolans Investment Ltd & 5 Ors* case [6], where the market CSD failed to prevent fraudulent share transactions through wilful collusion with other market intermediaries, exemplifies such worry. Similarly, Nigeria's cybersecurity frailties, which are reflected in its low ranking as 81st in the global cybersecurity index [30] raise alarm about entrusting sensitive blockchain networks to institutions with histories of digital mismanagement and cybersecurity attacks [31].

The OECD warns that over-reliance on centralised validators could undermine blockchain's resilience [18]. This is more worrisome in low-trusting markets such as in Africa.

For Nigeria, the quest to deploy such innovation demands a dual focus, which is leveraging blockchain's efficiency while reforming the institutions that govern it. A number of possible recommendations can guide its market towards ensuring an effective governance framework. First, decentralised governance models could dilute centralised power by integrating independent validators – such as auditors or fintech firms – into blockchain consortia. Second, real-time audits and stringent penalties for governance failures must be mandated to enhance accountability.

Third, market regulators would require investments in regulatory technology (RegTech) to monitor smart contracts and decentralised systems effectively in order to prevent bad actors from exploiting gaps in the technology. This should be complemented with training of the staff of the regulators in blockchain forensics and smart contract auditing to bridge technical knowledge gaps.

Fourth, there is the need to strengthen the country's weak digital environment through an enhanced framework for data protection and a coordinated cybersecurity regime. The proposition is that regulators of the Nigerian capital market should capitalise on the recent data protection Act to ensure that customers data are well protected. This is essential because findings from Project Khokha 2 cautions that while DLTs provide data transparency, it also highlights privacy concerns [19]. It is also noted that the current cybersecurity regime in Nigeria appears to be staggered with different institutions left to develop their own cybersecurity strategy. To address this, there should be an overarching and coordinated cybersecurity framework similar to what is prevalent in the UK [32]. This would guarantee standards of operation across all parastatals and relevant bodies that engages with relevant market operators since market institutions would remain key players under the blockchain. This should also be supported with an effective implementation by relevant stakeholders.

It is submitted that blockchain's success in Nigeria hinges on reconciling its disruptive potential with the realities of institutional frailty. While permissioned ledgers offer stability, their viability depends on addressing cybersecurity weaknesses, regulatory inertia and accountability deficits. For Nigeria, blockchain adoption must be paired with institutional reforms – transparent governance, robust cybersecurity frameworks and agile regulation – to avoid digitising dysfunction. Without this, blockchain risks becoming another layer of fragility in a market already grappling with systemic trust deficits.

9. Custody implications of blockchain adoption in Nigeria's capital market

The integration of blockchain technology into Nigeria's capital market could introduce complex custody challenges, particularly in reconciling the decentralised ideals of blockchain with the centralised realities of asset management. Tokenised securities – digital representations of real-world assets like equities or bonds – require a trusted intermediary to anchor these tokens to tangible off-chain assets [18]. While blockchain's promise of decentralisation suggests a future where investors self-custody assets through private wallets [18], the practical demands of regulatory compliance, legal enforceability and systemic stability necessitate reliance on centralised custodians [18].

This hybrid model where blockchain tracks ownership but legal custody remains with centralised institutions dominates global pilots [19, 28]. Their involvement in a blockchain environment is also borne out of the argument that centralised institutions like CSDs have expertise in the management and settlement of securities transactions. This was evident in the approach taken by the Bank of France experimentation of the settlement of government bonds in Central Bank Digital Currency with blockchain technology [33]. There, Euroclear France – (a legacy CSD) was selected to play a custodial role for the off-chain asset.

However, the case of Project Khokha 2 presented a unique opportunity for African markets to learn from. The POC sought to reimagine the custodial responsibilities of traditional central securities depositories (CSD) and the role of other financial market infrastructure (FMIs) in a blockchain-operated capital market. The POC developed a specialised decentralised DLT-based token trading platform (TTP) named the "Khokha hub" which sought to compose and combinedly perform key roles in the capital market, such as a trading platform, central securities depository (CSD), securities settlement system (SSS) and elements of the payment settlement system. However, while the POC showcased that various market intermediaries can be streamlined (which can reduce settlement times and errors) and custodial activities can be performed solely by the DLT, the practical realities as envisioned by SARB is that the TTP would still be controlled by a consortium of market institutions but with a more decentralised governance model [19]. This is a sensible approach that aligns with the hybrid approach on custody of assets.

For Nigeria, the possible reliance on market institutions would raise profound concerns about accountability and trust. The antecedent of legacy market institutions in handling and management of investors' assets has been fraught with transparency issues. The case of *CSCS & Anor v. Bonkolans Investment Ltd & 5 Ors* [6] starkly illustrates these concerns. The case revealed systemic negligence and collusion on the part of market institutions like the Central Securities Clearing System (a CSD) to syphon the asset of investors. In that case, the staff of the CSD colluded with stockbrokers to inject forged share certificates into its depository to enable unauthorised sales. The CSCS, which is tasked with safeguarding investor assets under Section 34 of *Nigeria's SEC Consolidated Rules and Regulations (2013)* failed to verify broker declarations, thereby violating its fiduciary duty. During litigation, the CSCS attempted to downplay its role by framing itself as a passive "complement" to market intermediaries. This evasion of accountability underscores a deeper institutional malaise.

Further examples can be drawn from market institutions like commercial banks in Nigeria which may likely take on custodial responsibilities in a blockchain-operated market. There have been a number of instances where customers have complained about unauthorised deductions of their deposits or investments [7]. There are also cases where staff of the bank have colluded to hack the bank's system and fraudulently convert customers' funds [8]. Insights from the legal and compliance officers of top commercial banks interviewed in this study noted how entrenched these issues were. This is coupled with a weak digital infrastructure which has been subject to incessant cyber-attacks [34]. Their perspective coincides with the data presented by the Nigeria Inter-Bank Settled System (NIBSS) which noted a +23% increase in the value of fraudulent transactions perpetuated in the Nigerian financial system from 2019 to 2023 [35]. All of these issues showcase the custodial fragility and integrity of market institutions in the country. It raises a logical concern that if market institutions cannot uphold integrity in the traditional market, entrusting it with blockchain-based custody risks digitising existing flaws with a tendency to erode investors' confidence and market integrity.

While blockchain technology is transformative, it does not replace existing infrastructures, rather it augments it. As noted by the Boston Consulting Group, CSDs in tokenised markets will likely retain governance roles by enforcing standards and resolving disputes [11]. However, this requires custodians to operate with unprecedented accountability. In Nigeria, reforms are critical for the successful implementation of the technology in its market. There may be a need to integrate independent validators into custody systems to audit transactions and asset holdings in real time to reduce opacity. Second, there is a need to develop standardised guidelines for hybrid custody models to address vulnerabilities, such as enabling third-party audits.

The tension for emerging markets in Africa is concerning as custody frameworks under a blockchain-operated market will likely remain tethered to the same institutions that have historically struggled with accountability. For Nigeria, this means that technological adoption must parallel institutional reform. Rebuilding trust in custodians like the CSCS, commercial banks and other market institutions demands not just an upgraded technology but a cultural shift towards transparency, rigorous enforcement of fiduciary duties and

participatory governance. Without these steps, blockchain risks becoming a digital veneer over systemic dysfunction, which may leave investors vulnerable in a new era of market infrastructure. Thus, the promise of blockchain lies not in its codes but in the integrity of those who govern it.

10. Enforcement framework and supervisory mechanisms: A critical pillar for blockchain adoption

The integration of blockchain technology into Nigeria's capital market will demand a supervisory and enforcement framework capable of operating at the speed of code. Prescriptive rules commanding market institutions to comply with transparency and accountability market rules without active enforcement will not suffice. Blockchain's promise of real-time settlements, 24/7 market operations and immutable transaction records [18] therefore hinges on regulators who can enforce rules with equal precision and agility. However, Nigeria's SEC has in some instances exhibited systemic inefficiencies that threaten to undermine this vision. An illustration of this challenge is the *Prof Anthony Asiwaju v. SEC & Anor* case [36], where the SEC imposed a four-year lien on shares during an investigation without resolving the underlying dispute. While the Investment and Securities Tribunal upheld the SEC's authority, it rebuked the regulator for its inertia. This case spotlights a culture of delayed enforcement that clashes with blockchain's instantaneous nature.

This enforcement laxity is not an isolated flaw but a symptom of institutional inertia. Under Section 304 of the Investment and Securities Act, the SEC collaborates with law enforcement agencies like the police to address criminal market activities. However, cases involving fraud or asset mismanagement often languish in bureaucratic limbo. Furthermore, the illegal dissolution of the Investment Securities Tribunal (IST) – the arbiter for entertaining securities dispute in the Nigerian capital market – in 2015 contrary to the provisions of Sections 277 and 278 of the Investment and Securities Act, mirrors the institutional fragility in the system, and if repeated, could affects the ability of the regulators to effectively exercise their powers using judicial pathways. In a blockchain-driven market where transactions settle irrevocably in minutes, such delays could render enforcement actions obsolete, leaving investors with irreversible losses.

The stakes are further heightened by blockchain's automated architecture. Features like smart contracts are capable of executing transactions without human intervention, thereby leaving regulators with no room for post-hoc corrections. If a fraudulent transaction occurs on-chain – say, a manipulated tokenised bond sale – the regulator must be able to act instantly to freeze assets or reverse actions. However, it would appear that the market regulators lack the institutional culture to meet this demand. Traditional enforcement timelines, measured in months or years, are incompatible with blockchain's real-time ecosystem. This mismatch risks would erode investor confidence in the ability of the regulators to protect them in a digitised environment.

These enforcement gaps compound Nigeria's preexisting governance and custody challenges. As explored earlier, entrusting blockchain governance to its traditional CSD, as already criticised for negligence in the *Bonkolans* case, creates vulnerabilities. Consider a scenario where the CSD, acting as a blockchain validator, approves a fraudulent transaction. The SEC's ability to investigate and remediate such an incident in real time becomes critical. In a hybrid custody model where blockchain tracks ownership but assets are held by market institutions like the CSDs, such an arrangement would demand rigorous oversight by regulators to prevent collusion. Without agile enforcement, blockchain's transparency becomes a façade and runs the risk of digitising corruption rather than deterring it.

The path towards a successful adoption of blockchain in Nigeria's capital market would likely involve a radical reimagining of Nigeria's regulatory framework. First, as earlier suggested, regulators must integrate regulatory technology (RegTech) tools – AI-driven surveillance systems and blockchain analytics platforms to monitor transactions in real time and flag anomalies. Second, there may be a need to introduce statutory timelines for resolving blockchain-related disputes to avoid enforcement inertia. Finally, collaborative oversight models, such as fintech sandboxes (similar to initiatives like the FCA digital sandbox [37]) or POCs such as that in Project Guardian (led by the Monetary Authority of Singapore (MAS) and a consortium of market institutions) [38] could be developed to foster innovation while allowing regulators to co-develop enforcement protocols with market participants.

Furthermore, there should be protection and independence of the adjudicatory body that entertains securities disputes such as the IST. The reason for this is because resolution of disputes that occur on-chain would still have to be entertained off-chain, and a dissolution of the IST as was seen in 2015 by the executive arm would threaten systemic stability under a blockchain-operated capital market. The proposal is to remove the IST from the appendage of the executive arm and place it under the judiciary to be overseen by the National Judicial Council (NJC) and also specifically capture it under the Constitution of the Federal Republic of Nigeria. This would give it the protection, stability and independence it needs to resolve market disputes without undue interference.

11. Conclusion: The pathway forward and the role of strong institutions

The quest to adopt blockchain in capital markets in emerging economies in Africa presents tension between balancing innovation and systemic stability due to institutional fragility in the region.

Blockchain's promise of transparency, efficiency and reduced costs is undeniable, but its potential remains shackled in markets where weak governance, lax enforcement and cultural tolerance for opacity persist. For emerging markets in Africa, the path forward demands more than adopting blockchain – it requires rebuilding the very systems that sustain trust. Douglass North's institutional theory underscores this position by positing that economic progress depends on formal institutions (laws, regulations) and informal norms (trust, transparency) that reduce transaction costs and uncertainty [13]. For blockchain, this translates to a foundational need for robust institutions capable of enforcing contracts, protecting property rights and fostering trust – prerequisites that appear to be deficient within markets in the region.

Advanced economies appear to exemplify North's thesis with the presence of strong institutions like regulators who enforce stringent transparency norms, such as transaction reporting and strict anti-money laundering (AML) protocols, amongst others. It is stated that these frameworks can only thrive on cultural norms of accountability, and as Elinor Ostrom's work on collective governance emphasises, trust is not legislated but cultivated through consistent, transparent practices [39]. The various recommendations offered in this article can help douse the tension that blockchain adoption would create in the capital market in Nigeria and within the region.

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