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Evaluating the evolution, implementation, and future prospects of central bank-based digital currencies: A case study of Nigeria's e-Naira

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Abstract

This research examines the development, implementation, and future prospects of central bank digital currencies (CBDCs), focusing on Nigeria's e-Naira. The rise of digital currencies and blockchain technology has provided new payment options worldwide. CBDCs are increasingly seen as faster and cheaper alternatives for transactions, with potential benefits for payment settlements, financial inclusion, and monetary policy effectiveness. The e-Naira was introduced to complement Nigeria's physical currency, representing a significant initiative by the Central Bank of Nigeria (CBN). As of March 2024, more than 130 countries were actively researching CBDCs, with three countries, territories, or currency unions having already launched CBDCs and 36 conducting pilot programs globally. This study delves into blockchain technology as a precursor to cryptocurrencies, analyzes recent trends in monetary policy, explores global factors driving CBDC emergence, and examines the e-Naira's future trajectory. It also discusses key policy considerations and proposes strategies to promote e-Naira adoption. By synthesizing these aspects, the research offers a comprehensive view of CBDCs within Nigeria's financial landscape, highlighting challenges and opportunities in digital currency adoption.

Keywords: Central Bank Based Digital Currencies; Nigeria; e-Naira; Blockchain; Cryptocurrency

1. Introduction

The contemporary monetary system comprises central bank money, such as banknotes (cash), known as "fiat currency," issued by a central bank and backed by government credibility, as well as private money (or private sector-issued money) like bank deposits [1]. In this system, the central bank is responsible for issuing money to maintain price stability. However, the Fintech-driven evolution in payment systems has significantly transformed the concept of currency [2]. This technological revolution, which introduced digital ledger, blockchain, and other innovations, along with the advent of private virtual currencies, has compelled central banks to explore the benefits of issuing "central bank-based digital currency (CBDC)" [3].

The use of digital currencies is rapidly increasing worldwide. According to Huang and Mayer [4], there are nearly ten thousand different digital currencies globally, with an estimated volume of over US\$1.90 trillion as of the first quarter

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of 2022. This mode of payment is growing quickly, as reflected in transaction volumes. Cryptocurrency is a promising digital payment and investment system. Its adoption as a medium of exchange is gaining momentum globally, including in Nigeria.

Cryptocurrency is an electronic or digital form of money that operates in real-time through peer-to-peer computer networks or on mobile phones with relevant apps. It is described as a digital asset designed to function as a medium of exchange, using cryptography to secure financial transactions, control unit creation, and verify asset transfers [5]. Unlike fiat currencies, cryptocurrencies lack a central bank to implement monetary policy to stabilize purchasing power, leading to potential price fluctuations driven by demand changes.

Cryptocurrency functions like any other currency intended as a medium of exchange but utilizes decentralized technology, allowing users to secure payments and store money anonymously without involving banks. According to Dierksmeier & Seele, as cited in [6], parties in cryptocurrency transactions do not need to know each other, ensuring anonymity. Cryptocurrencies are created through a process called mining, which involves using computer power to solve complex problems [7].

Several global trends and motivational factors have influenced central banks' interest in and accelerated their work on digital currency [8]. These trends include the growing interest in Bitcoin and other cryptocurrencies that compete with traditional money forms; private sector-issued stablecoins, distinct from other cryptocurrencies due to their stable value backed by major currencies; the impact of the COVID-19 pandemic; and the rise of big technology companies.

The emergence of cryptocurrencies has raised concerns among Nigerians and the government. This prompted the Central Bank of Nigeria (CBN) to caution citizens against using privately issued cryptocurrencies. Despite potential benefits for the Nigerian economy, the CBN remains wary. Among the many cryptocurrencies circulating globally, Bitcoin, Ethereum, and Ripple are the most widely used.

Unlike traditional payment systems in Nigeria, which typically involve the Naira for transferring value, cryptocurrencies have their own value metrics. Cryptocurrencies function as electronic tokens without reference to any physical item or sovereign currency. Their use threatens central banks' exclusive rights to issue money and control the money supply through various monetary policies. As demand for cryptocurrencies increases, it creates a parallel system that fragments the monetary system, causing issues for the CBN. This problem is exacerbated by the potential financial and consumer risks in the cryptocurrency environment, necessitating the government's development of policy and regulatory responses to crypto asset activities.

On February 5, 2021, the CBN declared that dealing in cryptocurrencies and facilitating cryptocurrency exchanges were prohibited, effective immediately. Months later, on October 25, 2021, the Nigerian apex bank unveiled its digital currency, the "e-Naira," an electronic equivalent of the local paper Naira currency it issues [9].

The aim of this study is to evaluate the evolution, implementation, and future prospects of central bank-based digital currencies (CBDCs), using Nigeria's e-Naira as a case study. The specific objectives are to: examine the blockchain technology that paved the way for cryptocurrencies; assess recent trends in monetary policy; analyze the global trends leading to the creation of CBDCs; identify Nigeria's central bank-based digital currency, the e-Naira; assess the operation, risks, and benefits of the e-Naira; explore the future of the e-Naira and its policy concerns; and suggest actionable policies to encourage the adoption of the e-Naira.

1.1. The Blockchain Technology

Blockchain is essentially a distributed database and open-source platform where anyone can modify the underlying code and view the status of an operation. It operates as a peer-to-peer network with a massive global database running on countless computers. This system does not require intermediaries to authenticate transactions [10]. Blockchain represents the decentralization and distribution of data that records financial ledger entries or various transactions [11]. Each transaction is digitally signed to ensure authenticity and integrity, making the ledger and its transactions highly reliable. The digital ledger records transactions across numerous computers, preventing any involved records from being altered retroactively without changing all subsequent blocks [8].

Since its creation in 2008, numerous cryptocurrencies have operated on blockchain networks. According to Okpalaojiego [12], blockchain has proven useful in governance, cybersecurity, industrial processes, the financial sector, entertainment, education, and many other fields. Ateniese et al. [13] argue that blockchain could become the foundation of global recordkeeping systems. Its scope has the potential to disrupt critical barriers to efficiency, commitment, and

growth by recording any structured data from start to finish. Blockchain also supports settlement systems, facilitating trillions of real-time transactions in banks.

1.2. The Crypto-currency

Cryptocurrency is a decentralized digital payment system that uses cryptography for security and anti-counterfeiting measures, often maintaining user anonymity [5]. This digital money is a financial instrument typically issued by companies or groups to attract financial resources for promising projects or asset capitalization [14]; [15]. Cryptocurrencies serve as tools that verify the identity of their owners and ensure that issuers fulfill their obligations to holders [16].

Mandeng [17] describes cryptocurrencies as private, de-nationalized, unreserved, floating, and convertible forms of money. Public circulation of cryptocurrencies began in 2009 with Bitcoin, created by an unknown inventor under the pseudonym Satoshi Nakamoto. Bitcoin introduced a decentralized digital currency built on peer-to-peer transactions facilitated by blockchain technology, eliminating the need for intermediaries [18].

Bitcoin, the first and most popular cryptocurrency, paved the way for other digital currencies such as Ethereum, Ripple, Dash, Monero, Classic, and Litecoin. Known as digital currency, digital cash, virtual currency, and electronic currency, cryptocurrencies can be used as a medium of exchange and a store of value. Unlike traditional currencies, cryptocurrencies operate without a central bank or single administrator, enabling peer-to-peer transactions over the blockchain network without intermediaries [7].

Mishkin [19] identified several characteristics of fiat money that apply to cryptocurrencies as well: ease of standardization, wide acceptability, divisibility, ease of carrying, and resistance to deterioration. Cryptocurrencies also share these characteristics: they are easy to transport, difficult to counterfeit, and highly secure. They are scarce and limited in supply, can be exchanged with local currencies regardless of physical entity, location, or time, and are liquid due to their exchangeability with major currencies like the Naira or the Dollar [8]. However, Weber [20] cautioned that widespread adoption of cryptocurrencies could lead to counterfeiting and erosion of their safety.

Despite their benefits, cryptocurrencies pose significant challenges for international financial institutions and governments. De Filippi [10] noted that the pseudonymity and ease of transactions make cryptocurrencies attractive to non-state and criminal networks seeking to evade taxes, governmental restrictions, and international penalties. Unlike traditional fiat transactions, which involve trusted third parties like banks and credit card firms that disclose transactions linked to criminal or terrorist organizations, cryptocurrencies bypass these safeguards, complicating efforts to deter unlawful activity [21]. Consequently, many countries struggle to fully regulate cryptocurrencies.

1.3. Recent Trends in the Conduct of Monetary Policy

Over the years, Nigeria's economic landscape has been shaped by various global and domestic challenges, influencing the country's monetary policies and economic performance. In 2015, Nigeria faced the dual challenges of managing an oil price shock and currency depreciation. Global economic conditions were weak, with falling oil prices and US policy normalization creating additional pressures. Domestically, the economy slowed to a growth rate of 2.79%, a significant drop from 6.22% in 2014. Inflation rose to 9.55% in December from 8% at the end of the previous year. The Central Bank responded by reducing the Monetary Policy Rate (MPR) from 13% to 11% and adjusting the Cash Reserve Ratio (CRR) to 20%, while maintaining the Liquidity Ratio at 30% [22].

In 2016, the focus was on addressing the recession and inflation pressures amid a global backdrop of slow growth and geopolitical tensions. Nigeria's economy contracted by 1.5% as it dealt with low reserves and naira depreciation. Inflation soared from 9.62% in January to 18.55% in December. The Central Bank raised the MPR from 11% to 14%, keeping other rates stable to manage the economic pressures [23].

In 2017, Nigeria aimed to stabilize its economy post-recession, navigating global challenges such as protectionist policies and US monetary policy normalization. The economy began to recover, evidenced by a GDP growth of 0.77%. Inflation moderated from a high of 18.72% in January to 15.37% in December. The Central Bank maintained its monetary policy stance with the MPR at 14%, CRR at 22.5%, and Liquidity Ratio at 30% [23].

The year 2018 was marked by managing liquidity amidst a slow economic recovery. Global issues included trade tensions and geopolitical uncertainties. Nigeria saw improvements from its recession, with fiscal receipts and real sector interventions contributing to GDP growth, although at a slower pace, peaking at 1.81% in the third quarter. Inflation

declined significantly from 15.13% in January to 11.44% in December. The monetary policy stance was steady, with the MPR maintained at 14%, the CRR at 22.5%, and the Liquidity Ratio at 30% [23].

In 2019, amidst global uncertainties such as rising external debt and trade tensions, Nigeria's economy experienced modest growth post-recession. This growth was driven by oil production and fiscal interventions, with GDP growing steadily from 2.10% in the first quarter to 2.55% in the fourth. Inflation saw a slight increase, ending the year at 11.98%. The Central Bank reduced the MPR by 50 basis points to 13.5% and retained other key rates [23].

In 2020, Nigeria's economy grappled with the severe impacts of COVID-19. Global lockdowns, declining demand, and trade disruptions were prevalent. Domestically, a recession hit in the third quarter due to lockdowns, but recovery was seen in the fourth quarter, aided by the Economic Sustainability Plan. GDP growth figures reflected this turbulence, with a sharp decline in the second quarter (-6.10%) but a positive turn by the end of the year (0.11%). Inflation rose significantly from 12.13% in January to 15.75% in December. The Central Bank of Nigeria responded with accommodative monetary policies, reducing the MPR from 13.5% to 11.5% while maintaining the CRR and Liquidity Ratio [23].

In 2021, the country faced significant disruptions due to the global pandemic, with supply chain issues and vaccine hesitancy compounding aggressive virus mutations. Domestically, rising public debt, insecurity, and energy price shocks further strained the economy. Despite these hurdles, Nigeria's GDP showed resilience, growing by 0.51% in the first quarter, peaking at 5.01% in the second, before moderating to 4.03% and 3.98% in the third and fourth quarters, respectively. Inflation persisted above the 11.5% policy rate throughout the year. The monetary policy remained broadly accommodative, maintaining key rates such as the MPR at 11.5%, the CRR at 27.5%, and the Liquidity Ratio at 30% [23].

Throughout these years, Nigeria's economic strategy and monetary policy have been crucial in navigating both global and domestic challenges, aiming to stabilize and stimulate growth in a fluctuating economic environment.

1.4. Global Trend That Leads to the Creation of the Central Bank-Based Digital Currency

As of 2020, the value of cryptocurrency transactions in Nigeria exceeded US\$400 million, and by 2021, it was US\$316.90 million [24]. Despite this decline, the number of Nigerians engaging in cryptocurrency continues to grow. Factors driving this adoption include the continuous drop in the value of the naira, inflation, and new opportunities. However, the negative experiences of Nigerians with various Ponzi schemes have made the government skeptical of cryptocurrencies, viewing them similarly to such schemes. Consequently, the Nigerian government, through bodies like the Central Bank of Nigeria and the Securities and Exchange Commission, has attempted to restrict cryptocurrencies. Unlike countries such as Morocco and Algeria, which explicitly prohibit Bitcoin trading with high fines for violations, Nigeria's legal stance on cryptocurrencies remains ambiguous [25].

Ozili [26] describes how the creation of a central bank digital currency (CBDC) might lead to the collapse of digital currencies, including cryptocurrencies and Bitcoin. Ozili [26] argues that central banks will leverage their monetary powers and the trust citizens have in government-backed money, providing strong incentives to issue a CBDC. Scholars like Kiff et al. [27] and Mancini-Griffoli et al. [28] suggest that a CBDC could reduce the costs associated with cash usage and enhance the security of payment systems and consumer protection.

Other scholars, such as Nelson [29], agree that issuing and adopting a CBDC will ensure interest rates are no longer constrained by the zero lower bound, allowing central banks to reduce rates as needed in a deflationary spiral and use negative interest rates when necessary. Additionally, a CBDC could potentially reduce fraud and money laundering [30] [31], provide sovereign alternatives for digital payments [32], stimulate local payment innovation [33], complement current forms of money and financial services [34], and ensure efficient monetary policy transmission [35].

Four global trends have encouraged central banks to research the issuance of digital currencies. Firstly, the use of physical cash for business and payments has been declining. A Global Web Index survey found that 77% of South Koreans prefer cashless payments, compared to only 33% in the Philippines. In Nigeria, the minting of banknotes has steadily decreased from 3.3 billion pieces in 2008 to 2.5 billion in 2021 [36] ; [37].

Secondly, there has been an explosion in the adoption of electronic and digital payments worldwide. In Nigeria, the value of digital payments grew from about US\$324 billion in 2017 to US\$2.60 trillion in 2021. Thirdly, the lack of a swift and effective solution to the preference for cashless payments and misplaced fears of central banks causing

hyperinflation created space for non-government entities to establish new forms of “private currencies,” gaining popularity and acceptance globally, including in Nigeria.

The fourth trend is the growing expectation that central banks will issue state-controlled digital currencies in response to the rise of private digital currencies. A survey of over 1,600 financial leaders across 22 countries found that 85% of payment leaders at financial institutions globally believe their country’s apex bank will launch a digital currency within the next four years [38]. Boar et al. [39] found that about 86% of central banks are actively researching digital currency potential.

Common arguments against issuing and adopting a CBDC include potential disruptions to the traditional payment and financial systems [40];[41], loss of privacy for users [42]; [43], increased cybersecurity risks [44], and heightened risks of bank disintermediation [45]. Despite these concerns, Nigeria has embarked on developing digital currencies, as the optimal allocation of monetary policy can be more effectively implemented with digital currency than with cash, provided the cost of using digital currency is not too high [46].

1.5. The Nigerian Central Bank Based Digital Currency (The e-Naira)

The central bank digital currency (CBDC) represents the digital form of traditional paper money and constitutes a liability of the issuing central bank [47]. It serves as an electronic substitute for physical cash, fulfilling all functions associated with conventional money. Initially, the CBN prohibited regulated institutions from engaging in any transactions involving virtual currencies in January 2017 [48]. This stance was reinforced on February 5, 2021, with a complete prohibition on dealing in cryptocurrencies and facilitating their exchange due to concerns over anonymity, lack of Know-Your-Customer (KYC) compliance, and the potential for illicit activities [9]. The CBN emphasized the need to safeguard Nigerians from fraud, investment risks, money laundering, terrorism financing, and other criminal activities associated with unregulated entities.

In 2022, the CBN imposed fines totaling 1.314 billion Naira on six commercial banks for failing to comply with the cryptocurrency ban and directives related to the closure of accounts involved in cryptocurrency trading [49]. This ban has sparked considerable controversy and resentment among Nigerians, many of whom view cryptocurrencies as a refuge in a struggling economy, where Nigeria ranks as the world’s second-largest Bitcoin market after the United States, with over \$500 million in Bitcoin trading in recent years [50].

Following months of the cryptocurrency ban, the CBN introduced its digital currency, the e-Naira, on October 25, 2021. Designed as an electronic equivalent of Nigeria’s fiat currency, the e-Naira is backed by law and the sovereignty of Nigeria [22]. Unlike its intention to replace physical cash, e-Naira aims to provide a secure and efficient digital payment alternative. Similar to China’s digital renminbi and Sweden’s ECC-krona, it can be purchased by the public and transferred to users’ e-wallets, maintaining parity with the value of physical naira notes [51].

1.6. Operation, Risks, and Benefits of the Nigeria Digital Currency (The e-Naira)

Cryptocurrency is a decentralized, encrypted digital currency that relies on blockchain technology, whereas e-Naira is a government-controlled digital currency designed to maintain parity with Nigeria’s official currency. Similar to coins or cash, the e-Naira is a liability of the CBN. Although it uses the same blockchain technology as Bitcoin or Ethereum, the e-Naira is distinguished by strict access controls enforced by the central bank. Unlike these cryptocurrencies, the e-Naira is not an independent financial asset but a digital representation of the national currency, maintaining its value by pegging it to the physical naira.

To use e-Naira, individuals must first create an e-Naira wallet, a digital storage system leveraging blockchain technology. Initially, only the government’s Speed Wallet is available, but financial institutions will eventually develop their own versions. Creating an e-Naira wallet involves downloading the e-Naira app from the Google Play Store or Apple Store and registering. Users with feature phones can use USSD codes to register. Once set up, users can transfer money from bank accounts or credit cards to the e-Naira wallet and send and receive payments in digital currency.

A primary objective of the e-Naira is to enhance financial inclusion by integrating millions of unbanked Nigerians into the financial system. In 2020, about 58 million adult Nigerians were unbanked, with 35 million of them owning mobile phones, potentially reachable via mobile money. Additionally, digital currency could reduce the substantial cost of printing physical currency, which amounted to N307 billion (\$747 million) from 2014 to 2019, according to a CBN report [52]. Unlike digital banking, which involves transacting with money held in a bank, the e-Naira represents actual money earned and stored by customers in their e-wallets. This setup allows users to handle it like fiat cash without

intermediaries, reducing transaction costs and time and enabling unbanked Nigerians to transact in e-Naira without needing private bank accounts [51].

The CBN has highlighted several significant benefits of the e-Naira for Nigeria and its citizens, including promoting rapid financial inclusion, lowering cash processing costs, enabling direct welfare disbursements, reducing the informal economy, enhancing tax collection, boosting cross-border trade and remittances, improving payment efficiency, fostering economic growth, establishing credit history, and advancing the Central Bank's cash-less policy by eliminating multiple clearing and settlement steps in domestic digital payments [53].

However, the implementation of e-Naira also presents several risks: operational risk, cybersecurity risk, internet disruptions, and low penetration, financial exclusion and illiteracy, and banking sector disintermediation. With internet penetration in Africa averaging 43.1% compared to the global average of 66.2% in 2021 [54], Nigeria's internet penetration stands at 55.4% in 2023. Additionally, with around 92 million people lacking access to electricity out of a population of 200 million, Nigeria has one of the lowest electricity access rates globally, according to Tracking SDG 7, Energy Progress Report 2022.

Macroeconomic instability is another challenge associated with digital currency, as it can render the economy susceptible to instability [55]. Nicolaisen [56] warned of the risks of an economy lacking functional legal tender. Furthermore, Wadsworth [57] and Ozili [58] found that the pros and cons of a central bank-issued digital currency vary across different central bank functions.

1.7. The Future of the eNaira

The evolution of blockchain technology has led to the development of alternative payment systems in the form of digital currencies, marking a significant milestone in the payment landscape. The CBN's launch of the eNaira as a digital form of the naira exemplifies this progression. It serves as an example for other central banks to consider issuing their own central bank digital currencies (CBDCs). In Nigeria, the implementation of the eNaira has demonstrated its potential as a powerful tool for enhancing monetary policy effectiveness, improving the payments system, and increasing financial inclusion, among numerous other benefits.

As the CBN actively works to build consumer confidence in digital currency, a gradual shift from cash to digital currency is anticipated in the near future. Projections indicate that the number of eNaira wallets and transaction volumes will rise significantly over the next five years. By 2026, the CBN expects over 20 million eNaira wallet downloads and a projected transaction volume of 300 million [2]. This transition presents numerous opportunities for investment and innovation, including the creation of jobs for onboarding agents and the development of wallet designs and hardware tokens.

Foreign investors are encouraged to seize these opportunities, fostering innovation and enhancing competition within Nigeria's digital space. While some countries have experimented with digital currencies, the CBN's eNaira stands out due to its scalability, interoperability, flexibility, and adaptability. The eNaira is designed to accommodate future expansion, interact with private sector digital banking payment innovations, support multi-digital currency initiatives by central banks, and adapt to changing government policies. With extensive public awareness campaigns planned for the second and third phases of its implementation, the CBN expects more users to adopt the eNaira, bringing significant potential benefits to the economy.

1.8. Policy Concerns

While many central banks are actively exploring the potential of central bank digital currencies (CBDCs), only two countries, the Bahamas with the Sand Dollar and Nigeria with the e-Naira, have actually launched such initiatives. Despite this, some influential policymakers argue that CBDCs are "a solution in search of a problem." Although central bankers increasingly view CBDCs as a realistic option [59], questions arise as to whether similar objectives could be achieved through alternative means. Current regulations do not adequately address the transition to a digital age, particularly concerning physical cash's limitations.

Efforts to maintain widespread cash usage may incur substantial economic costs without clear benefits, making the introduction of CBDCs appear essential for ensuring the continuity of the monetary system. The threat to monetary sovereignty is significant, particularly given the intersection of BigTech and cryptocurrencies, along with the strong network effects in digital services and payments. Inaction on regulatory fronts could expose CBDCs to financial stability risks akin to those faced by banknotes during the free banking era and money-market mutual funds before the 2008 financial crisis [60].

In Nigeria, the successful implementation of the e-Naira hinges on critical prerequisites such as seamless internet connectivity and reliable power access. However, a major obstacle remains the lack of trust in digital currencies. Nigeria's reputation for high risks associated with money laundering and terrorist financing has been underscored by global assessments. For instance, in February 2023, Nigeria was placed on the Financial Action Task Force's (FATF) grey list due to insufficient measures to combat these activities. Similarly, the Basel Institute of Governance ranked Nigeria 17th out of 128 countries in terms of money laundering and terrorist financing risks in 2022.

The design of Nigeria's CBDC, the e-Naira, allows the CBN to monitor all transactions, potentially enabling it to detect and mitigate money laundering and terrorist financing activities, thereby improving Nigeria's global risk ranking. However, this level of transaction oversight has raised concerns among potential users in Nigeria. Many believe that the e-Naira was developed primarily for government surveillance of financial transactions, compromising privacy rights and potentially facilitating governmental control. This lack of trust significantly impedes the adoption of the CBDC in Nigeria. A survey conducted in Europe and the United States also highlighted widespread concerns about privacy [61].

Although CBDCs may present opportunities for enhancing monetary policy effectiveness and modernizing the payment system, addressing issues of trust and privacy is crucial for their successful adoption and implementation in Nigeria and globally. Regulatory frameworks must strike a balance between ensuring financial stability and preserving individual privacy rights to foster public confidence in CBDCs.

1.9. Actionable Policies to Encourage the Adoption of eNaira

Addressing the array of challenges hindering widespread adoption of the eNaira is complex and not swiftly resolved. Among the primary infrastructural hurdles, inadequate power and internet access must be prioritized for improvement. One proposed solution involves enabling offline access to the eNaira platform, a step initiated by the CBN through the introduction of the Unstructured Supplementary Service Data (USSD) code. This initiative allows Nigerians without internet-enabled phones to conduct transactions using eNaira. To expedite and enhance eNaira adoption, the CBN should ensure accessibility for all mobile phone users. Incentives such as rebates during income tax payments or discounts for using eNaira to pay for services like cabs (as seen in October 2022) could encourage broader usage.

Zamora-Perez et al. [62] argue that central banks often face challenging decisions regarding prioritizing policy goals, designing strategies to boost adoption, and selecting designs that mitigate negative economic impacts. Carstens [61] emphasizes that CBDCs represent a collaboration between the public and private sectors, suggesting they should capitalize on private sector innovation while defining roles for both sectors. This could involve adopting either "Intermediated" or "Hybrid" CBDC architectures. Well-designed and widely adopted CBDCs, Carstens argues, could function as complementary payment methods addressing various use cases, correcting market failures, and stimulating ongoing innovation and competition across payments, finance, and commerce.

The risks posed by eNaira to commercial banks, such as increased funding source volatility, bank runs, and potential disintermediation, could be mitigated by imposing limits on eNaira holdings or implementing variable interest rates to discourage large holdings. The International Monetary Fund [63] suggests rapid liquidity intervention to support commercial banks should depositors temporarily shift funds from bank deposits to eNaira during crises. Additionally, CBDCs could be made interest-bearing, with rates consistently lower than policy rates, not only to support effective monetary policy but also to enhance their attractiveness as stores of value.

Regarding the international monetary system, CBDCs like the eNaira may challenge international currency competition. It is suggested that the issuance of foreign CBDCs could facilitate the adoption of alternative digital currencies. While there are speculations that China's digital currency could rival the US dollar as a global reserve currency [64]; [4], Carstens [61] argues that the dominance of a reserve currency depends on macroeconomic factors such as low inflation, ample supply of safe assets, and the credibility of economic and legal systems. Thus, the US dollar's status as the world's primary reserve currency is likely to persist due to its deep and efficient capital markets and the absence of capital controls, which are crucial factors driving global confidence.

2. Conclusion

Amidst a global shift towards digital currencies, the eNaira aims to enhance monetary policy effectiveness and reduce reliance on physical cash through secure and efficient digital transactions. Despite initial challenges related to trust and regulatory frameworks, the eNaira has made notable advancements since its inception. With over 130 countries actively researching CBDCs and several already implementing pilot programs, the eNaira exemplifies Nigeria's proactive stance in embracing digital innovations to stimulate economic growth and strengthen financial stability. The achievements

within its first year of launch are promising, affirming it as a positive step forward and a response by central banks to the growing influence of cryptocurrencies. Insights gained from its implementation highlight the importance of stakeholder engagement, regulatory readiness, and ongoing innovation to maximize the eNaira's potential impact on Nigeria's financial landscape. Recognizing associated challenges, proactive measures have been implemented to mitigate vulnerabilities and prevent potential setbacks. Crucially, lessons learned emphasize the necessity of raising awareness and building trust among stakeholders during the design and launch of the eNaira.

Compliance with ethical standards

Disclosure of conflict of interest

There is no conflict of interest.

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