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Abstract

Nigeria is the first African country to issue a central bank digital currency (CBDC) also known as a fiat digital currency. The eNaira CBDC was issued as a money equivalent to be used alongside with paper Naira. This paper identifies the features, opportunities and risks of the central bank digital currency (CBDC) in Nigeria, also known as the eNaira. The opportunities which CBDC present to Nigeria include improved monetary policy transmission, convenience, efficient payments, increase in the level of financial inclusion, and higher remittance inflow. Some identified risks include digital illiteracy, increased propensity for cyber-attacks, data theft, and the changing role of banks in a full-fledged CBDC economy.

Keywords: central bank digital currency, eNaira, blockchain, cryptocurrency, CBDC, Nigeria, financial inclusion, remittance, monetary policy, payments, cybersecurity risk.

JEL code: E51, E58, N17, O55.

1. Introduction

A central bank digital currency (CBDC) is a fiat currency in electronic form issued by a central bank. Debates about CBDC emerged in the global scene during the meteoric rise of private digital currencies or cryptocurrencies such as bitcoin in 2019. Increased use of cryptocurrencies by citizens led governments to begin to think about a government-issued digital currency and determine whether there is a strong case for creating a central bank digital currency.

Some central banks have reached an advanced stage in testing CBDC. Countries like Sweden, Bahamas, France, Philippines, Japan, Turkey, Switzerland and Ghana are testing their capability to issue a CBDC. Meanwhile, other countries, like the US, have not found a compelling need to issue a CBDC.

Some central banks, such as the People's Bank of China and the Central Bank of the Bahamas, have issued a CBDC as a counter-reaction to cryptocurrencies while other central banks, such as the Central Bank of Nigeria, issued a CBDC to be used as an alternative payment solution.

In Nigeria, the central bank barred financial institutions from facilitating cryptocurrency transactions on the 5th of February 2021. The central bank instructed all regulated financial institutions to close all cryptocurrency-related accounts. Soon after, the central bank in mid-2021 announced that it will issue a pilot central bank digital currency in October, 2021. The digital currency project was tagged ‘Project Giant’ by the Nigerian central bank. The central bank’s move to create a CBDC arose from four sources: (i) the issuance of CBDC by other central banks, (ii) the embrace of cryptocurrencies by Nigerian citizens, (iii) the potential for increased criminal activity when cryptocurrencies are used to make payments, and (iv) the need to harness the numerous benefits of a trusted, government-issued digital currency for the Nigerian economy.

Given the local circumstances in Nigeria, and the widespread interest in cryptocurrencies by economic agents especially by individuals and businesses, questions have begun to arise about the risks and opportunities of CBDC in Nigeria, how the Nigeria CBDC or the eNaira will be used in Nigeria, whether it will be well-received by citizens, and how it can

solve some of the problems associated with paper money in Nigeria. In this paper, I address the first question about the opportunities and risks of CBDC. This is the first paper to explore CBDC in Nigeria.

This paper contributes to the emerging literature on central bank digital currencies. It contextualizes the Nigerian CBDC experiment, and offer arguments in support of a CBDC while identifying potential risks associated with the Nigeria CBDC or the eNaira. This paper also contributes to the monetary economics literature by presenting CBDC as an alternative to paper money. This paper contributes to the literature by showing that CBDC is a distinct type of fiat money, which is different from the historical forms of money in terms of its design and use. This article also contributes to the literature by evaluating the pros and cons of a fiat digital currency.

The rest of the paper is organized as follows. Section 2 presents a review of the existing CBDC literature. Section 3 describes some features of Nigeria's CBDC. Section 4 highlights the opportunities or benefits of the Nigeria central bank digital currency. Section 5 highlights the risks of the Nigeria central bank digital currency. Section 6 concludes.

2. Literature review

Ozili (2019) states that blockchain is a ledger that record transactions involving digital currencies including cryptocurrencies and central bank digital currency. Bordo and Levin (2017) show that CBDCs are useful for transparent conduct of monetary policy. They show that CBDC can serve as a costless medium of exchange, secure store of value, and stable unit of account. Engert and Fung (2017) show that the relevance of CBDC in facilitating retail payments depends on the specific attributes of the CBDC such as whether the CBDC bears interest or is non-interest bearing. Barontini and Holden (2019), in a survey of studies on CBDC show that many central banks are progressing from conceptual work into experimentation, proofs-of-concept, and are in cooperation with other central banks. Only few central banks are proceeding to the pilot stage with CBDC, and even fewer central banks see the issuance of a CBDC as a short or medium term goal. Ozili (2022a), in a survey of CBDC adoption in Africa, shows that over 70 per cent

of African countries have not shown any interest in adopting a central bank digital currency. Only three African countries have a robust payments infrastructure to support a CBDC. Grym et al (2017) show that CBDC will not only enable the general public to hold CBDC, it will also have significant implications for other areas of central bank policy. Andolfatto (2021) investigates the impact of CBDC on banks, and find that interest-bearing CBDC will increase financial inclusion, diminish the demand for cash and expand the depositor base of banks if the added competition compels banks to raise their deposit rates. Davoodalhosseini (2021) investigates the optimal monetary policy when only cash, only CBDC, or both cash and CBDC are available to agents in Canada. He finds that a more efficient allocation can be implemented by using CBDC than with cash if the cost of using CBDC is not too high. Wadsworth (2018) and Ozili (2022c) find that the pros and cons of a central bank issued digital currency are mixed across each of the different central bank functions. Ozili (2022b) describes how the creation of a central bank digital currency might lead to the collapse of digital currencies including cryptocurrencies and bitcoins. Ozili (2022b) show that central banks will leverage on their monetary powers and the trust that citizens have in government-backed money. This will give central banks strong incentives to issue a central bank digital currency. He further stressed that the issuance of a central bank digital currency can erode trust in cryptocurrencies, and can lead to the collapse of cryptocurrencies although not immediately. Náñez Alonso et al (2021) analyse CBDC status in countries like the Bahamas, China and Uruguay. They find that these countries are at different stages of CBDC development. Bjerg (2017) argues that a monetary system that has two competing money creators – the central bank and the commercial banking sector – can simultaneously only pursue two out of the following three policy objectives: (i) free convertibility between CBDC and bank money, (ii) parity between CBDC and bank money, and (iii) central bank monetary sovereignty. Ward and Rochemont (2019) shows that many central banks have a negative view on cryptocurrencies and they promote CBDC even though the international community has divided opinions on the potential benefits of CBDC itself.

3. Features of the Nigeria central bank digital currency – the eNaira

3.1. Design of the Nigeria central bank digital currency, the eNaira

Below are some of the design features of the eNaira at inception.

- The eNaira is designed to be the same Naira with more possibilities
- The eNaira platform can be found at: https://enaira.gov.ng/
- Nigeria operates a two-tier retail CBDC model.
- The eNaira is designed to enhance the structure of participating financial institutions instead of replacing them. The Nigeria CBDC model retains financial institutions as intermediaries between the central bank and customers.
- The eNaira is designed to be a legal tender in Nigeria.
- The eNaira is designed to have a non-interest-bearing status at inception.
- The eNaira is designed to have a transaction limit for customers.
- The eNaira is designed to have a value-based transaction limit.
- The eNaira data is stored locally and securely, making it difficult to be hacked remotely by a foreign entity.
- The eNaira is held in an account-based wallet commonly known as the eNaira speed wallet.
- All data and personal information are not stored on the blockchain ledger for security reasons.
- The eNaira technology leaves behind an audit trail to trace all financial transactions.
- The eNaira is offered via a tiered AML/KYC approach. It uses the National Identification Number (NIN) and the Bank Verification Number (BVN) as unique identifiers.
- The eNaira can be used without an internet-enabled phone.
- The eNaira is designed to offer settlement finality.
- The eNaira is designed to be delivered through a collaboration between the central bank and participating financial institutions. Financial Institutions will act as the bridge between customers and the Central Bank so that financial institutions can offer customer support services on inquiries about the eNaira.

3.2. Consumer Wallet Tier Structure

Tier	Category	Transaction limit	Requirement to make payment	Regulatory validation
0	Non-Account Holders	Daily Transaction Limit: ₦20,000 Cumulative total: ₦120,000	Telephone Number (whose National Identification Number (NIN) is yet to be validated by NIMC)	Must provide passport photograph, name, place and date of birth, gender, address and telephone number
1	Non-Account Holders	Daily Transaction Limit: ₦50,000 Cumulative total: ₦300,000	Telephone Number (whose NIN is already validated by NIMC)	Must provide passport photograph, name, place and date of birth, gender, address and telephone number
2	Account Holders	Daily Transaction Limit: ₦200,000 Cumulative total: ₦500,000	Bank Verification Number (BVN)	Must provide BVN, Tier 1 requirement plus evidence of ID
3	Account Holders	Daily Transaction Limit N1,000,000 Cumulative total: ₦5,000,000	Bank Verification Number (BVN)	Full KYC requirement as stipulated in the CBN AML/CFT regulations

3.3. Participants in the digital currency program

1. The Central Bank: As the sole monetary authority, the Central Bank of Nigeria will oversee the issuance, distribution, re-distribution, monitoring and destruction of the first product component of the central bank digital currency or the eNaira. This means that, at the initial stages of the digital currency program, only the central bank will issue, redeem, distribute, monitor or destroy the eNaira.

2. Licensed financial institutions: Another participant in the Nigerian digital currency program is licensed financial institutions. They will be allowed to request specific quantities of the central bank digital currency. They will manage the central bank digital currency across their bank branches in different parts of the country. Licensed banks in

Nigeria will invite their customers to register for the eNaira. They will provide reporting and accountability to the central bank for the distribution and use of the eNaira. Licensed financial institutions will also be required to maintain high levels of know-your-customer (KYC) identity checks and anti-money laundering (AML) capabilities using sophisticated monitoring software or tools.

3. Government agencies: Government agencies will be able to enroll into the central bank digital currency program. This will allow government agencies to process all digital currency payments received or sent to other government agencies, citizens and businesses in an efficient and convenient manner.

4. Merchants: Merchants will be allowed to provide remote payment solutions at low cost for digital currency transactions. The eNaira speed wallet issued to merchants will have online transfer capabilities, transactions analyses and reconciliation features for customers.

5. Retail Consumers: Retail customers will have an eNaira speed wallet and a security token. The eNaira speed wallet architecture has innovative features, including user-friendly designs and advanced privacy and security features. Users will be able to pay for goods and utilities with the tap of a button or by using the QR barcode, thereby, providing convenience to users. Retail customers will be able to purchase specific quantities of the eNaira using the Naira they already have in their bank accounts. After purchase, the Naira account of customers will be debited while the eNaira wallet of customers will be credited with the value purchased. Also, the Naira will be exchanged for the eNaira at a rate of 1:1. In other words, one Naira will be equal to one eNaira.

3.4. Policy objectives of the eNaira

The policy objectives of the eNaira are:

- To facilitate micro-payment
- To offer a low-cost transactional platform, and
- To become a catalyst for the digital economy in Nigeria

4. Opportunities or benefits of the eNaira

A central bank issued digital currency (CBDC) has several opportunities for the Nigerian economy. They include the following:

- it will enhance the transmission of monetary policy
- the government will be able to send direct payments to citizens using the eNaira
- it can improve the drive towards cashless policy
- it will offer cash alternatives and reduce the dependence on cash
- it will promote diversified payment options in the country
- it can increase remittance inflows by making diaspora remittance transfers faster and cheaper
- it will increase financial inclusion because consumers do not need to have a bank account to hold a CBDC or the eNaira.
- it will improve trust and efficiency in the management of the Nigerian currency
- it will reduce the cost of cash management by reducing the cost of handling cash, reducing the cost of printing cash, and reducing the cost of cash destruction, thereby saving cost for the government.
- it will reduce settlement risk
- it will simplify cross-border transactions
- it will reduce illegal activities such as fraud and money laundering. This is because digital payments and transfers using the eNaira will be easier to identify and trace back to the unique ID of the originator, thereby reducing fraud risk and money laundering risk. It will also prevent funds from being hidden and transferred outside the financial system.
- the eNaira will create easy access to financial services at remote areas that have suffered from financial exclusion for many years
- tax evasion will become difficult in Nigeria when eNaira is used to make payments for goods and services. The eNaira will make taxable assets traceable and will enforce transparency in the taxation system, thereby increasing tax revenue to the government.
- eNaira will make cross border payments cheap and safe.

5. Risks

It will become necessary for the central bank to address some challenges, monitor CBDC risks on a real-time basis, and mitigate risks as they emerge.

Some areas to focus on include:

1. **Rising digital illiteracy**: There is need to increase the level of digital literacy among the old and young population. These segments of the population, especially in the rural North, do not fully understand digital technologies, and may find it difficult to understand what digital currencies are. This will limit their ability to use the eNaira to the fullest to improve their welfare. To address this issue, there is need to introduce an extensive digital literacy program in the country, and also introduce an awareness program on how individuals can use the eNaira to improve their welfare.

2. **Protecting users**: The central bank should ensure that the eNaira CBDC platform is able to: (i) protect the mobile data of all users of the eNaira, (ii) protect the bank application that users use to manage their eNaira holdings, and (iii) protect the mobile application and the backend server connectivity.

3. **The propensity for cyber-attacks**: The central bank should encourage users to adopt additional state-of-the-art mobile security tools to protect their mobile data and application in order to avoid becoming targets of criminal organizations.

4. **Data theft risks**: On the blockchain and CBDC platform, the central bank will need to adopt a multilayer defense system to avoid data breaches and hacking problems. The eNaira applications should have in-built systems that guard against malicious keyloggers, mobile malware, remote screen capturing, and careless screen sharing that can be used by organized crime networks to steal the eNaira.

5. **The changing role of banks in a full-fledged CBDC economy**: In the future, digital currencies will encourage peer to peer (P2P) transactions that do not require

a financial intermediary. This means that the significance of financial institutions in a full-fledged CBDC economy may diminish and can lead to loss of income for financial institutions. In the case of Nigeria, the central bank may need to review the operationalization of the eNaira to ensure that a CBDC economy does not have an adverse effect on licensed financial intermediaries in Nigeria.

6. Conclusion

This paper discussed the opportunities and risks of central bank digital currency in Nigeria. The opportunities which CBDC present to Nigeria include improved monetary policy transmission, efficient payments, convenience, increased remittance inflows, and increase in the level of financial inclusion. Some identified risks include digital illiteracy, increased propensity for cyber-attacks, data theft, and the changing role of banks in a full-fledged CBDC economy. Despite these risks, CBDC may solve many problems than it creates. The risks it poses will provide an opportunity for the Central Bank of Nigeria to learn, and improve the design of the CBDC and also improve the security features of the eNaira. Policy makers in Nigeria should harness the benefits of CBDC, and develop a regulatory framework for digital assets in Nigeria. This will help to address some of the risks associated with the eNaira. Future studies can explore the ways in which CBDC leads to higher financial inclusion in Nigeria. Future studies can also examine the state of CBDC adoption in other African countries.

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