Central Bank Digital Currencies and the Future of Value Transfer: Developments, Challenges, and Strategic Implications

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ABSTRACT

The most recent development in digital currency and payments is Central Bank Digital Currencies (CBDCs). In an effort to regain monetary sovereignty, some central banks have either stated their intention to do so (such as the US Federal Reserve, the European Central Bank, and the Bank of England) or have already done so (such as the People's Bank of China). This may be the last chance for these central banks to do so. This paper hypothesises that CBDCs represent a last frontier in the field of digital money and digital payments.

However, there are a number of issues with CBDCs, including as their practical use and legal classification, as well as concerns about the technology that central banks would use to implement them in the economy. Legally speaking, CBDCs would be considered a central bank liability, or a claim on the central banks, and are intended to be a type of fiat currency.

Given the digitisation of international payments, which is dependent on the technology's connectivity, certain CBDCs may be utilised across borders in addition to domestically.

Keywords: Central Banks Digital Currencies, Financial Regulations, Crypto

INTRODUCTION

Central Bank Digital Currencies (CBDCs), as a financial services innovation, are probably going to be crucial in determining how value transfer develops in the future. The majority of central banks throughout the globe are now evaluating the possibility of introducing their own digital currencies at different stages. Due to the disruption brought on by COVID-19 and advancements in technology and payments, interest in CBDCs has skyrocketed in recent years. The increasing popularity and power of bitcoin as an asset class and as a medium of exchange has also contributed to this transition.

CBDCs might develop a Future of Value Transfer platform that supports a more robust, creative, and competitive payment system for individuals, companies, and economies as a result of the growing globalisation and digitisation of financial services.

Because they guarantee consumers have access to secure digital currency, CBDCs are expected to increase the efficacy and efficiency of a jurisdiction's payment system. Compared to other less secure digital instruments, which might result in less dependable payments, a more volatile store of value, and perhaps undermine monetary and financial stability, CBDCs will provide users a sovereign alternative. With the increasing usage of cash decreases and new "value transfer alternatives" in the payment cycle, it could become even more crucial in the future. Banks and other financial services companies must plan for this inevitable change and anticipate how it will affect their balance sheets, technological models, client propositions, and profit pools.

Rapid information and communication technology (ICT) growth in the twenty-first century had a significant impact on the financial system, resulting in the development of cutting-edge payment systems and creative financial services. This development gave rise to digital currencies, also known as programmable money, which are any payment systems that are only available electronically and do not require physical tools like coins, cheques, or notes. Similar to real, physical currencies, this type of money may be accessed through a variety of electronic devices and utilised for a variety of purposes, including the purchase of products and services. Digital

currency is a simple way to make payments, especially when conducting business across large distances. The network-based architecture of digital currencies makes payments quick and simple.

Digital currencies may be essentially divided into two categories: decentralised and centralised. Central Bank Digital Currency (CBDC) is a type of centralised digital currency that is issued by a central authority, typically the central bank. Decentralised digital currency, on the other hand, is issued by private entities without the need for a central depository. Globally, the usage of digital currencies is growing quickly.

Nearly 10,000 distinct digital currencies exist worldwide, with an expected value of approximately US$1.90 trillion as of March 1, 2022, according to Huang and Mayer (2022). The volume of transactions shows how quickly the usage of this form of payment or money is expanding around the world. The usage of digital currencies is simple, and transactions may be completed nearly instantly. Transaction costs are nil when they are between clients using the same platform, and they are very low when they are across separate platforms. Digital currencies are impervious to destruction or physical flaws. Digital currencies eliminate all of the expenses and hassles associated with producing or printing currency.

The adoption of digital currencies has many benefits, but there are also many significant obstacles to overcome. The substantial risk of hackers stealing from digital wallets is one of them. Another significant obstacle to the usage of digital currencies, especially in poor and emerging nations, is the lack of necessary infrastructure, such as secure internet access. Digital currencies are extremely volatile due to the exchange rates, especially those that are privately issued, typically vary significantly when compared to traditional cash.

This paper will focus on the nature, kinds, trends, opportunities, and drawbacks of digital currencies are covered along with the connection between them and the future framework of value transmission.

This will be structured into the following sections. Section 2 will focus on the research methodology, section 3 will examine the extant literatures on Digital Currency and its types, role of Central Bank Digital Currencies, Prospects and Benefits of Digital Currencies. Section 4 examined the recent developments, findings and discussions in Nigeria and Section 5 looks at the recommendations and conclusions.

RESEARCH METHODOLOGY

The systematic literature review (SLR) was used in this work. Owoeye (2023) argued that the SLR identifies, selects, and assesses research that addresses a given topic. Before beginning the systematic review, the criteria should be explicitly established. The author described the key sources of literature for each of the study subjects using SLR. The author conducted an SLR using a sample of 85 research publications. These articles were selected from a pool of 300 papers gathered from various relevant sources. The publications were chosen based on their citation count in Google Scholar, Scopus, and the journal's impact factor.

In addition, the author synthesised the literature using the QCA and applied it to provide answers to the research question. The author chose the most current papers from 2005 to 2025 that were cited by several academics since Central Bank Digital Currencies (CBDCs) has been a significant topic of research for the past 20 years. According to Okoli and Schabram (2010), the SLR is a methodical, transparent, exhaustive, and repeatable process for locating, evaluating, and synthesising recent academic, research, and practice literature. Finding pertinent articles, creating a screening strategy, evaluating the quality, extracting pertinent material, and analysing and synthesising the results are the next five phases in the SLR process. Lastly, a report and summary of the review's conclusions are provided (Xiao & Watson, 2017). One method for determining the factors that contribute to certain outcomes is qualitative comparative analysis, or QCA. This research technique aims to draw valid conclusions from contextual data in order to offer understanding, fresh concepts, fact interpretation, and advice for real-world application. Giving a comprehensive picture of the phenomena is the goal. Models, conceptual maps, conceptual systems, and categories are frequently developed using QCA ideas or categories.

There are two possible approaches to QCA: deductive and inductive. When prior knowledge of the subject is inadequate, inductive reasoning is employed. However, deductive content analysis was created to investigate new information or validate hypotheses (Elo & Kyngäs, 2008). In order to critically assess the work, the author employed an inductive approach. Three steps have to be considered. The author started by choosing passages from search articles that addressed the three study topics. The author then addressed the research questions of

the study by choosing sentences from each section. This research will examine the critical issues stated above. The next section will provide a comprehensive review of the Digital Currency and its types of Digital Currency.

What is Digital Currency and the versions of Digital Currencies

Digital currency is a virtual currency that is created electronically and stored on the distributed ledger technology's operational architecture. It can be used in a decentralised payment system and in a number of other distributed data systems, with uses ranging from certification to transaction monitoring (Foster et al., 2021). The three types of digital currencies are Central Bank Digital Currency (CBDC), Virtual Currency, and Cryptocurrency (Zhong, 2022). This has improved the global financial system and created new opportunities. But it also carried with its serious issues that hindered its widespread acceptance and uptake.

A radical shift away from the traditional system of value exchange and the development of new currencies that enable instantaneous peer-to-peer transfers of value in a previously impractical manner have resulted from the ongoing global expansion of the internet and technology, particularly FinTech (Brunnermeier et al., 2019). This supports the widely held belief that it makes value transfers via the internet possible without the need for traditional institutions.

Private Digital Currencies

These are digital products offered by companies that function similarly to currency, serving as a store of value, a unit of account, and a medium of exchange. Facebook Credits, Microsoft Points, and Amazon Coins are a few examples (Gans & Halaburda, 2013). Since they lack a tangible equivalent and do not constitute a claim on real assets, they are digital. A digital transaction involving a contractual agreement to move actual funds between accounts is not the same as this (Gans & Halaburda, 2013). Because it is issued by a group of developers or groups rather than the state's monetary authority, cryptocurrency is categorised as private. This may be the case, however certain cryptocurrencies, like Bitcoin, are open because they employ a publicly owned distributed ledger network.

Cryptocurrency

Since cryptocurrencies eliminate the inefficiencies and extra expenses of middlemen like commercial banks, central banks, and credit card companies, they seem to be revolutionising the payments system (Prasad, 2022). After its white paper was published in 2008, an unidentified programmer going by the name Satoshi Nakamoto created Bitcoin, the first cryptocurrency ever known to exist. Since then, cryptocurrencies have evolved from niche technological oddities to rapidly expanding financial instruments that are garnering a lot of public interest (Perkins, 2020). Ethereum, Litecoin, Solana, Cardano, and stablecoins (such as USDT, USDC, and BUSD) are more cryptocurrency types whose values are correlated with certain currencies.

However, the popularity of cryptocurrencies has sparked conjecture over whether they would replace fiat money or simply be a front for the current monetary system. Even while speculation is still running strong, it's crucial to remember that how well cryptocurrencies carry out the traditional roles of money in comparison to the existing financial systems will probably have a big impact on their future worth and relevance.

Virtual Currency

Virtual money is a type of means of exchange that works similarly to real money but lacks all of its features, underscoring the fact that it is not recognised as legal tender in any country (Dibrova, 2016). A founding agent or developing agent composed of several stakeholders oversees virtual money, which is an unregulated digital currency (Zhong, 2022). The European Central Bank (2012) states that "virtual currency is a type of unregulated digital money, which is issued and usually controlled by its developers, and used and accepted among the members of a specific virtual community." Virtual currency is employed when the currency utilised as the unit of account has no legal tender status and no physical equivalent.

Common Private Digital Currencies

The supply side is one of the most complicated problems with digital currencies (Dwyer, 2014). Major tech

companies are developing digital currencies that enable quick and simple transactions without the use of fiat money, undermining central banks' ability to maintain their monopoly on currency creation as the world grows more digitally connected and the use of physical money declines (Kriwoluzky & Kim, 2019).

Bitcoin and Ethereum are the most well-known private digital currencies that are now in use and have similar fundamental technologies. Their usefulness is firmly based on their supply and demand. Cardano, Solana, Binance Coin, Dogecoin, Bake, Cake, Ripple, Litecoin, and more are among the others. They all use blockchain technology as their foundation. Furthermore, Owoeye (2023) paper on the integration of Artificial Intelligence and Blockchain in the Banking Industry argued that currently 25% of all international remittances are based on blockchain technology. Given its capacity to induce a change in business paradigms, it undoubtedly represents a substantial element of digital transformation. By using the vast potential of its fundamental concepts, it is transforming several conventional banking practices. These ideas are described here to help you better understand the blockchain concept. The decentralised, transparent, and safe character of blockchain is what makes it valuable. A business always wants its database to be indestructible, transparent, safe, and impenetrable. And blockchain specifically tackles every issue that conventional database systems have. Furthermore, blockchain significantly reduces operating costs by doing away with third-party intermediaries from the system. Additionally, blockchain technology has improved transaction speeds. Because of these unique features, blockchain is now a practical and affordable alternative for all businesses, making it extremely important.

Central Bank Digital Currencies (CBDCs)

Egbuna (2022) argued that Central Bank Digital Currencies (CBDCs) is digital currency that is denominated in the national unit of account and it is directly linked to the central bank. They can be either account-based and rely on identification or token-based and enable anonymity in payments through the use of distributed ledger technology (DLT) or more conventional technological infrastructures (Auer et al., 2021). The public now has digital access to central bank reserves instead of just commercial banks thanks to this new kind of fiat money. It would establish a hybrid system by combining the digital aspect of deposits with the usefulness of currency in peer-to-peer transactions (Agur et al., 2019). Global conversations around CBDCs have been spurred by the rise of cryptocurrencies or private digital currencies like bitcoin (Ozili, 2022).

As people' use of cryptocurrencies developed, governments began thinking about issuing their own digital currency and assessing if there is a strong case for creating a central bank digital currency (Ozili, 2022).

Deloitte (2022) report emphasized that all players in the global financial services sector stand to gain significantly from Central Bank Digital Currencies (CBDCs), which have the potential to be the most widespread innovation in the digital and payments area. A central bank digital currency is a new kind of money that may be issued along with the supporting infrastructure for transactions. A digital payment instrument that is directly liable to the Central Bank and is valued in the country's unit of account is called a CBDC. It is the digital legal money that the Central Bank issues as a store of value, unit of account, and medium of exchange. It is a digital version of fiat money with the same value as the real thing.

Key Drivers, Economic Impact and Associated Risks of CBDCs.

The demand for quicker payments, quicker digitisation, and improved clearing and settlement risk reduction are driving the need for CBDCs globally. Financial inclusion and more effective local and international value transfers are also in demand. Many governments and central banks are now stepping up their efforts to investigate a digital counterpart of the fiat money as a result of these developments. According to a 2021 BIS poll of central banks, 14% have been implementing pilot programs, 60% have been experimenting with the technology, and 86% have been actively investigating the possibilities of CBDCs (Boar and Wehrli, 2021).

Based on the arguments provided in Delloitte (2022) four main factors that are influencing central banks to assess CBDCs in addition to using them to influence monetary and fiscal policy were identified.

Restoring central banks as the hub of trust and currency creation is necessary.

Central banks are starting to recognise the value of non-fiat cryptocurrencies and the emergence of new digital currency types. They are also becoming more conscious of the possibility that, rather than just being observers, each of them may need to take on a major role within the system. Digital currencies that offer the genuine

advantages of alternative private currencies without having an adverse economic impact must be made available to the general population. Although AML/CFT regulations are not essential to issuing CBDCs, most central banks would build their platforms to meet these regulations as well as data security standards in order to foster confidence.

The financial system might become much more efficient with the help of CBDCs.

CBDC payments are final, gross, and made in real time. Interbank settlement and reconciliation are no longer necessary as this lowers the settlement risk in the financial system. Additionally, real-time and economical globalisation of payment systems may be made possible via CBDCs. There would be no "Herstatt" danger, and time zone variations would no longer affect currency settlements. With the use of smart contracts, CBDCs can enable "programmable money" for "atomic" transactions, in which the transfer of one asset to another is dependent on the other asset's real-time transfer. This would allow Payment versus Payment (PvP) for cross-currency transactions in a multi-currency CBDC environment, or Delivery versus Payment (DvP) for domestic transactions where the other asset might be a financial or physical item.

According to estimates, the cost of cash ranges from 0.5% of GDP (gross domestic product) for nations like Sweden to 1.7% of GDP for India. Four parties bear the majority of this cost, which excludes the ESG cost of producing money: families, companies, banks, and the central bank. Another factor to consider is increasing tax efficiencies, which in the case of India are anticipated to represent 3.2% of GDP. Clearing, settlements, and post-market operations are all made more efficient by CBDCs. The majority of security clearing and settlement procedures currently take several days to complete. The use of this digital currency would result in a notable boost in efficiency and a decrease in related reconciliation expenses.

Increasing financial inclusion and accessibility

Many central banks rely on CBDCs to democratise financial access by removing all middlemen and physical barriers, hence providing last-mile financial reach. Achieving the CBDC ideal, however, could be hampered by low-income populations' preference for cash as well as the expenses and technological difficulties of a fully digital currency. According to a recent 2023, ADB research, CBDCs might be a very effective way to address the issues of high remittance costs and more general financial inclusion issues. It will also be easier for Participating Institutions to use Open Banking frameworks to develop more pertinent client value propositions by utilising a two-tier CBDCs architecture.

Improving fiscal and monetary policies

The implementation of CBDCs may act as a catalyst for central banks to enhance their monetary policies. Its structure and design may make it possible for people to get government benefits in a smooth and transparent manner, enhancing transaction control.

Through the management of liquidity constraints and the provision of cryptocurrency alternatives to the general public, CBDCs would strengthen and promote financial stability.

Because of improved security and traceability provided by the digital trail, CBDCs may lower the danger of identity theft. Central banks may be able to preserve the real worth of money in the economy by using CBDCs to safeguard buying power. For instance, the nominal value of a person's CBDC assets may be encouraged under an indexation program during times of higher-than-expected inflation (Deutsche Bank's Future of Payments, 2020)

Central banks will be able to access more detailed payment flow data across an economy thanks to the digital nature of CBDCs, which will improve macroeconomic data analytics and integrity. CBDCs are intended to give consumers a new digital currency and method of payment, not to totally replace cash.

The eNaira – Nigeria CBDC

Nigeria is the first African country to launch a CBDC called eNaira. In 2021, the Central Bank of Nigeria released the eNaira, a digital currency, in compliance with Section 19 of the CBN Act. It is a direct duty of the Bank, a legal tender, equal to the actual naira by design, and part of the currency-in-circulation (Central Bank of Nigeia,

2021a). As a more effective and safe form of payment, eNaira will be used in addition to traditional naira. Furthermore, it will boost monetary policy effectiveness, bolster the government's capacity to carry out certain social programs, and boost remittances via authorised channels (Central Bank of Nigeria, 2021a). One of its main tenets is that it is an account-based CBDC approach to expedite financial inclusion.

The design concepts summarise the eNaira's main objectives. They outline its core principles as a mode of exchange and payment that must follow the three guidelines established by the Bank for International Settlements: efficiency, innovation, coexistence, and do no damage. This outlined the architectural and operational framework in accordance with the World Economic Forum, Coalition of Central Banks, and Bank for International Settlement (BIS) guidelines (Central Bank of Nigeria, 2021b). The Central Bank of Nigeria, financial institutions, agents, and international money transfer operators (IMTOs) make up the operating framework.

The eNaira payments system will continue to be managed by the CBN, which will also continue to be in charge of issuing the digital currency, managing the wallet, and recording all transactions. The CBN will supply the framework for implementation, oversight, and encouraging more innovation. In addition to providing additional payment services that are built on top of the eNaira payment system, financial institutions and other payment service providers will handle and process retail payments (CBN, 2021a). To facilitate a range of eNaira use cases, they are conducted on a platform that allows financial institutions and payment service providers to develop and create layered payment services. Individuals and merchants make up the tiers of the know-your-customer (KYC) framework that underpins this open system.

Other Live CBDCs

China CBDC – (E-CNY)

The China CBDC was created in 2014 and its initiation was intended to enhance the efficiency of China's retail payment system. Based on the advancement in technology, the pilot programme was launched in 2021. The CBDC was utilized and aimed towards a retail based leveraging account-based technology for circulation. There is no transaction limit set for it and this gave it's a wider acceptability. This was anchored by the China's Central Bank. The E-CNY focussed on a centralized approach with the Central Bank and the various commercial banks within the China's financial landscape are responsible for its distribution for public use which can be for domestic payments and offline payments. As a result of the China CBDC, the People Republic of China were able to explore new application models for economic and social development.

Cambodia CBDC

This was the brainchild of the National Bank of Cambodia with the aim of improving financial inclusion among its citizens particularly the rural unbanked members of the society. The CBDC form and access technology adopted by the National Bank of Cambodia was a retail based CBDC leveraging DLT on a hyper ledger platform. There are transaction limits set on the different wallets depend on the different risk categories. The CBDC was designed and distributed by the National Bank and only 16 banks are providing support for its distributions through its system (Deloitte 2022). Furthermore, Deloitte (2022) paper emphasized that early adoption of the CBDC was encouraging because over 10,000 users adopted it and retail transactions of over 2000 per second. The Cambodia CBDC can be used for domestic payments and cross border transactions. Due to the reasonable results from the CBDC, the Central Bank as proposed an extension of the business case for the financial market with the view of enable the features such ATM withdrawals, term deposits and traditional settlements.

Bahamas CBDC

This was introduced by the Central Bank of Bahamas to enhance financial inclusion and interoperability of payments. The technology adopted was also retail based CBDC leveraging DLT. There was a cap of 500 dollars and the monthly transfer limit was set at 1500 dollars. The currency distribution was mainly by the Central Bank, Commercial Banks, Credit Unions, PSPs or MTBs. The Bahamas CBDC can be used for domestic payments and offline payments. As a result of this, there is a high level of effective collaboration between the Central Bank of Bahamas and other stakeholders such as Banks, Credit Unions, PSPs and MTBs on issues like designing the required legal framework and data protection which needed to support the payment system.

Eastern Caribbean CBDC

Due to the special nature of the Eastern Caribbean, it launched its CBDC. This involved 4 of the 8-member countries (Deloitte 2022). The purpose of this strategy was mainly to reduce cost of transactions and make transactions possible to individuals without bank accounts, thus enhancing financial inclusion. The technology adopted was also retail based CBDC leveraging DLT. There was no transaction limit set for the Eastern Caribbean CBDC. However, this created some credibility issues here. The distribution was done by the Central Bank via its licensed banks and non-banks in the region. This CBDC is suitable for domestic payments and cross-border transactions. The adoption should reduce the usage of cash by 50%, enhance financial inclusion and for citizen in the eastern Caribbean to use CBDC as an alternative means

Opportunities and Advantages of Digital Currencies

For individual users, the monetary authority, and the nation as a whole, the usage of digital currencies offers a variety of options. Consumers benefit from continual operation, user anonymity, and 24-hour access to transaction services. The transaction pace is constant throughout without restrictions. The simplicity of use offers a chance to significantly lower the number of non-account owners, especially in Africa, hence advancing financial inclusion. The elimination of transaction fees, cheap conversion costs, speedy transfers to any location in the world, and increased protection against counterfeiting are all advantages to the financial system. Digital currencies offer a useful tool for crowdfunding, which is another financial advantage. Younger people are drawn to digital currencies because of all these advantages.

In particular, Ozili (2022) enumerated a number of benefits that the Nigerian economy will get from the CBN eNaira. Among them are the:

• promotion of the cashless policy;

• improvement of the monetary policy transmission system;

• the availability of alternatives to currency and a decreased reliance on it;

• making it possible for the government to pay residents directly;

• guaranteeing that the nation has a variety of payment alternatives;

• making cross-border payments easier, quicker, and less expensive;

• Increasing financial inclusion because holding CBDC does not need bank accounts

• an increase in confidence and effectiveness in Nigerian currency management;

• reducing the cost of managing currency, producing cash, and regulating the cost of destroying cash, all of which save the government money;

• reducing the danger of settlement;

• a decrease in illicit activities including money laundering and fraud. This is due to the fact that digital payments and transfers made using the eNaira will be simpler to recognise and link to the originator's unique ID, lowering the risk of fraud and money laundering. Additionally, it will stop money from being moved and concealed outside of the financial system;

• facilitating access to financial services in isolated locations that have long experienced financial marginalisation;

• preventing tax evasion in Nigeria by enforcing transparency in the taxation system and making taxable assets traceable, which would raise tax income for the government; and

• creating safer and more affordable diaspora payments.

Digital Currencies' Drawbacks and Difficulties

Although the emergence of digital currencies has transformed the global monetary system with several advantages, there are drawbacks and difficulties as well. Macroeconomic instability, a loss of monetary authority, systemic concerns, a danger to environmental sustainability, cybersecurity risk, an acceleration of digital bank runs, and a barrier to innovation in bank infrastructure are just a few of the drawbacks of digital currencies.

Macroeconomic instability:

The vulnerability of the economy to volatility is one of the difficulties and drawbacks of digital money. An economy may be prone to indeterminacy and lack a distinct equilibrium to sustain stable pricing if all payments are made using privately issued digital currencies (Fernández-Villaverde & Sanches, 2017). Nicolaisen (2017), who spoke about the dangers of a situation in which the Norwegian economy lacks any working legal currency, also confirmed the submission's accuracy.

Loss of monetary control:

Loss of monetary control might result from privately created digital currencies without a regulated framework. Interest rates for virtual currencies that aren't backed by any sovereign currencies are zero. Usually, interest on reserves (IOR) is used by central banks to direct monetary policy. The central bank's use of interest rates to regulate the supply of digital money within the economy becomes unfeasible as the monetary base in the current system is connected to the amount of reserve at the central bank (where the IOR acts as a floor for the market interest rate). In an effort to change this, CBDCs with an interest-bearing structure that anyone may own were introduced. This business improves the central bank's capacity to control market interest rates over time. Traditional monetary policy would not have an impact on economic activity involving crypto-assets as it only affects the supply and interest rates of sovereign currencies.

Systemic risks:

Digital currencies that are not regulated pose systemic threats to the economy. In general, the payments networks show growing returns to scale and significant externalities. In this regard, there is a danger of ongoing operational issues because the market values of digital currencies have shown extreme volatility and swings in recent years. The entire payment system might turn into a quasi-monopoly because it is privately denominated. In these situations, any major operational issue with the payments network might put the macroeconomy and the whole financial system at serious danger.

Threat to Environmental sustainability:

The potential for disastrous repercussions on the environment is one of the problems with digital currency. Central banks have often been advocates for environmental sustainability through the adoption of green monetary policies. Along with price and financial stability, the central bank's role in certain nations also includes ensuring environmental stability (Bank of England, 2021). According to Stoll et al. (2019), as of November 2018, Bitcoin consumed around 45.8 TWh (terawatt hours) of power per year, or 22–22.9 million metric tonnes of CO2 emissions.

Due in part to the "proof-of work" aspect of cryptocurrency mining, emissions related to all cryptocurrencies are expected to increase significantly. For example, according to Jiang et al. (2021), China's yearly energy consumption of the Bitcoin blockchain would peak at 296.59 TWh in 2024 and result in about 130.50 million metric tonnes of CO2 emissions. According to Mora et al. (2018), digital currencies might be a major factor in nations' inability to achieve the objectives of the Paris Agreement.

Encouragement of Money Laundering:

As the word "crypto" might imply, cryptocurrencies avoid official oversight and regulation. Peer-to-peer systems increase the risk of money laundering and financial fraud, including theft from digital wallets and other financial

crimes, because they assist avoid central bank regulation.

Accelerating Digital Bank Runs:

One of the characteristics of uncontrolled digital currencies, such as bitcoin, is that anybody may use them on computers and cell phones at anytime, anywhere, for free. They might facilitate bank runs if they have a smooth interface with financial applications. In this sense, depositors would quickly transfer their money from deposits to digital currencies if rumours or other events caused financial markets to become unstable. Such digital bank runs might be far faster than traditional bank runs since depositors don't need to be physically present at the bank or ATM to collect money. Digital bank runs may therefore accelerate the global spread of liquidity problems in a difficult climate. This implies that it will be challenging for financial markets or central banks to conceal the cause of a liquidity crisis in a short amount of time.

The Central Bank roles, the Digital Currencies and its impacts on the Financial System.

The role of Central banks in the management of monetary system is critical to the financial system. The ability to effectively manage the digital currencies in the 21st century cannot be overemphasized. Owoeye (2023) argued Central Banks should make financial regulation that enables development of major payment infrastructure and cutting-edge goods like credit cards, debit cards, ATMs, and wire transfers that were developed through private initiatives share traits with the current payment and settlement systems. In this sense, the predominance of digital currencies, which do away with middlemen in the financial system may impede private sector innovation, particularly in the area of payment and settlement infrastructure.

Additionally, this research made the case that, as a financial innovation, digital currencies are anticipated to do away with intermediaries in the payment system, which might cause disruptions. The system has undergone a number of significant developments as a result of recent digital innovation, which evolved into crypto-assets and the entry of large internet corporations into payment services. The growth of the financial system should result from Central Bank policy requirements for the efficient functioning of digital currencies. There are in-depth explanations of this in the next section.

Payments System Efficiency

The major function and mandate of the Central Bank in any economy is the attainment of efficiency in the financial system. The digital revolution in the currency architecture has implications for the efficiency of the payments system, depending on its design. Digital currencies contribute to enhancing the efficiency of economic transactions by making use of digital technologies while securing inter-operability of various payment platforms. Furthermore, Digital currencies should put competitive pressure on contemporary intermediaries, pushing for more efficiency, lower costs and better service in payment markets.

Central Bank Digital currencies that are regulated, for instance, would be particularly beneficial for lower-income households, who tend to rely heavily on cash, and for small businesses, which incur substantial costs for handling cash or substantial interchange fees for taking payments via debit and credit cards. The efficiency gains from establishing account-based digital currencies such as the case of CBDC will be substantial in this regard. This should stabilise the financial system particularly through systematic and transparent conduct of with the financial system.

Confidence and Trust in the Nigeria Monetary System

Traditionally, the institutional structure that supports the confidence and legitimacy of the contemporary monetary system is based on national laws, banking regulations, and deposit insurance monitoring. The foundation of countries remained the trust engine supporting the contemporary monetary system which Nigeria is not an exception. The current monetary system is typified by situations in which commercial banks provide deposits as handy private money while the central bank is the only issuer of the sovereign currency. This implies that in the absence of technical innovation to ensure trust, digital currency would erode faith in the monetary system of the future. The study made the case that the stability of digital currencies depended on national currencies' credibility. In this sense, Libra, stable coins, and CBDCs might be thought of as a hybrid of crypto-

assets and sovereign currencies schemes that use national frameworks to establish credibility and confidence. The future monetary system is unlikely to function outside of country states with such arrangements in place. It could be challenging for crypto-assets to displace sovereign currencies as long as nation states retain legitimacy and confidence. In this sense, the DLT underlying cryptocurrency assets like blockchain may be quite promising. These technologies have the potential to improve the efficiency of payments, settlements, and the economy if they are properly integrated with the legitimacy and confidence of current currencies. This is the foundation of the two-layered digital currency that the Japanese Digital Currency Forum envisioned as a means of accomplishing these objectives.

Transnational Transactions

Card networks, which rely on the correspondent banking system to settle cross-border payments, dominate the present payments system. Each transaction necessitates the issuing bank of the payer and the acquiring bank of the payee. Correspondent banking networks are also used by remittance service providers to transfer money to their destination, particularly when the destination is an associated organisation. Peer-to-peer payments in particular are seeing an increase in the number of financial technology businesses joining the cross-border payment market. Financial technology companies, for instance, are joining the remittance sector, enabling customers to send money directly to overseas mobile wallets and fund "mobile wallets" online using their bank accounts and credit or debit cards. The pace at which foreign currency and cross-border payments settle might be accelerated by digital currencies. Appropriately constructed currencies, like stable coin arrangements, may also provide comparable cross-border payment benefits by lowering the number of middlemen involved. However, there may be operational and cyber dangers. Therefore, regulatory bodies must restrict the degree to which such systems are exposed to operational and cyber hazards.

Additionally, they could have destabilising cross-border consequences by permitting significant and abrupt money transfers across countries. Digital payments require identity in order to address this. Furthermore, regulated digital currency, like CBDCs, may improve cross-border payment efficiency. The frictions in the current correspondent banking system, such as disparities in operating hours, different communication standards, and a lack of transparency on exchange rates or fees, might be addressed by such digital currency architecture. This was confirmed by the IMF in a recent research that demonstrated how the implementation of a regulated digital currency in this example, CBDC would speed up and securely settle cross-border financial transactions.

Data and Privacy Issues in the Financial Market

Monetary authorities will probably have more access to data related to everyday transactions made by anonymous customers with digital currency. They have arguments that countries or other persons who have access to the transaction history may utilise the digital currency payment system to spy on users, influence or coerce political opponents, or regulate economic activities.

Due of the ease with which their transactions may be monitored, political activists are more likely to be significantly impacted by such arrangements. However, this is dependent on how well monetary authorities can incorporate digital advancements into their platform. Without this, private individuals would still be the primary users of data. Financial and non-financial data are becoming more interconnected due to the digital transactions that e-commerce entails. As digital payment methods advance, they become increasingly important in gathering and handling a wide range of data related to payments and settlements. Financial and non-financial data will inevitably become increasingly interconnected due to the rapid acquisition and use of client data. For this reason, digital payment systems are being breached by several large technological companies.

However, a multilevel monetary system setup involving the central bank, private companies, and other regulatory bodies might help solve this. The ability of the monetary system to enable the secure and efficient use of data will have a significant impact on the economy's efficiency in such a setting. A cautious approach is necessary due to the risk of data breaches or exploitation by governmental bodies.

In this sense, it is necessary to enable technical solutions that restrict consumers' access to retail transaction data and prevent the central bank from discovering their identities. Therefore, if the design of the ideal style and role

allocation for the usage of the data related to economic transactions are taken into consideration, the future monetary system will not be badly impacted.

Private Money's Dominance in the Financial System

Even with technical innovation by monetary authorities, private money is more likely to dominate future payment systems than public money. Fiat currencies, or public money, are now exclusively available to the general public as coins or paper money. The public may find it more easy to make payments with private funds. The safety and liquidity of public and private money are different, even though they are frequently used interchangeably (enabling customers to pay for products and services using cash or bank deposits with similar ease). There is no credit or liquidity risk associated with central bank money.

As a result, settlement in central bank currency removes transactional uncertainty, promoting financial stability and economic activity. On the other hand, depending on the issuer's solvency and liquidity as well as the existence of a government backup (such as a central bank lender of last resort or deposit insurance), private money may pose credit or liquidity risk.

On demand, private money often guarantees a one-to-one conversion into public money. This characteristic makes private money vulnerable to runs, which can occur when holders of private money want to convert to public money and the solvency or liquidity of the underlying assets or obligations of the private money issuer are questioned. Federal deposit insurance, eligibility for the discount window, and prudential supervision and regulation significantly reduce the danger of runs at federally and state-chartered insured depository institutions. However, not every private money has the same protections, therefore certain private money issuers can be more vulnerable to runs.

Equity and Financial Inclusion

The goal of financial inclusion is to reduce knowledge asymmetry in order to overcome inequality. By increasing equitable access to financial services, especially for those underserved by the traditional banking system, encouraging greater and more cost-effective access to financial products and services, guaranteeing that everyone benefits equally from financial innovation, and reducing any undermining effects of financial innovation, digital currencies may promote financial inclusion and equity. The introduction of regulated digital currencies, such as CBDCs, is necessary to preserve public access to a secure sovereign-issued alternative to physical cash in light of the declining use of cash and the lack of universal access to the banking system brought about by the introduction of first-generation digital currencies.

Financial inclusion will be improved and promoted by utilising digital technology. Connecting the digital currency to a government-issued form of identity might improve inclusiveness. Authentication can assist long-term inclusion and formalise the informal economy by providing digital identification to the unbanked. There may be long-term benefits from overcoming this, even if there seem to be trade-offs because citizens also respect their privacy and like the anonymity of currency. Financial inclusion will not be greatly aided by digital currencies that lack identity, such as virtual currencies or token-based CBDCs. They may, in fact, undermine efforts to enhance it, which are based on good identification and building up an information trail for access to other financial services.

The currency's uniqueness

Future advancements in the field of digital currencies may weaken the currency's uniqueness. Significant amounts of risk might be introduced into the payments system by the advent of private forms of money, particularly digital assets that are not adequately supervised by prudential authorities. The emergence of non-interoperable private forms of money may potentially lead to the fragmentation of the payment system. Because banks must convert deposits and other short-term obligations into cash, this might undermine trust in money and the regulated financial system. Monetary inconvertibility has been shown to intensify shocks during emergencies.

Although well-designed and controlled sovereign-issued digital currencies might sustain the currency's

uniqueness, they are susceptible to runs since they are not subject to the proper regulation and inspection on a thorough and regular basis. These dangers would be reduced and their long-term stability would be ensured by legislation establishing such a framework.

Creation of Credit

Banks are important sources of credit for both individuals and companies. Although nonbank entities can use a bank to participate in immediate payment systems, their capacity to give direct access may offer further advantages in terms of access or competition. Since certain digital currencies are now created privately, how they are issued and the degree to which the assets supporting them contain loans or other private credit will determine how they affect financial intermediation. In addition to possibly raising banks' liquidity risk, digital currencies will limit banks' capacity to provide credit by decreasing bank deposits.

The impact of digital currencies on financial intermediation is contingent upon the kinds of organisations that provide access to these systems, i.e., whether banks or non-bank organisations are allowed to use the service. As is now the case, restricting participation primarily to banks might avoid disturbance to the production of credit, but it would also reduce the potential advantages of increased competition or access to payment systems, notably for underprivileged groups. However, for digital currencies intended as wholesale CBDCs, the potential impact on credit creation may be restricted. This is due to the fact that only institutions with reserve balances are able to employ these digital currencies. The implication is that there may be uncertainty about the long-term implications on banking intermediation.

Transfer of Illegal Funds

The absence of identity is one of the features of digital currency. First-generation digital currencies' anonymity may come with a greater danger of money laundering, funding of arms proliferation, and financing of terrorism than physical currency in the present monetary system. The nature of a digital currency arrangement (usage of permissioned blockchain in the case of stable coin) and the liquidity of widely used digital currencies may potentially attract criminal activity. An identity-verified system, in which middlemen gather and validate consumer data, might readily reduce these dangers.

Money laundering concerns may also be reduced by implementing international AML/CFT rules for digital assets. In order to improve the security of the payment system, stop fraud, aid in anti-money laundering initiatives, and stop the funding of terrorists, some kind of identity might also be useful.

Financial Stability

The influence of digital currencies on the monetary system's future might also be evaluated in terms of how this innovation impacts the central bank's ability to continue serving as the lender of last resort. A central bank's function as the lender of last resort is compromised when all payments are conducted with privately issued money, including virtual currencies, and it does not issue its own digital currency. This is because transactions occur outside of its regulatory purview. As a result, it has little capacity to stabilise systemic liquidity.

A recent research by Fernández-Villaverde and Sanches (2017) detailed the implications of such design on financial stability, demonstrating that an economy with digital money exclusively produced by private non-banks may be susceptible to an indeterminate equilibrium with unstable pricing. However, their statement made clear that the creation of controlled digital currency (such CBDCs) in conjunction with a suitable monetary policy framework can guarantee stability.

Final Thoughts and Policy Suggestions

The story of the financial system, particularly the payments system, is being altered by the technological revolution. One significant development in the financial system is the rise of digital currencies. Researchers, monetary authorities, and other policymakers are interested in the rate of expansion in the usage of digital currencies in terms of platforms, participants, and transaction volume. The banking system, the economy overall, and individual customers have all benefited from digital currencies, according to research.

The advantages include the ability to access transaction services around-the-clock, continuous operations, the lack of intermediaries and the financial rent they entail, a quick transfer system, cheap exchange costs, a useful tool for crowdfunding, and the possibility of reducing the gap in financial inclusion.

However, using digital currency comes with a number of difficulties and drawbacks. The difficulties include the monetary authorities' loss of control over money, systemic hazards, money laundering, threats to the sustainability of the environment, an increase in digital bank runs, and obstacles to innovation in bank infrastructure that might result in macroeconomic instability. The traditional monetary system will be significantly impacted by the rise and expansion of digital currencies.

The monetary authority may face significant challenges because the majority of digital currencies are issued by private companies with no oversight from any central body. As a result, central banks have to encourage research on how to carry out their customary roles in the modern financial system. With the rise of digital currencies, the fundamental role of financial institutions financial intermediation becomes more obsolete. The traditional two-tier structure and the existence of banks and non-bank financial entities are seriously threatened by this.

Another major obstacle to the innovation is the high rate of volatility of digital currency. Various models have been proposed and tested for the functioning of digital currency. Future studies should concentrate on determining the best technology for using digital currency. Among other things, research should focus on ways to preserve monetary sovereignty, secure financial assets, and effective domestic payments.

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