

Central Bank Digital Currencies Adoption: Threat or Opportunity?

1st Mounir KHATOUI ^{1(*)}

¹PHD, Lecturer professor, University of Ghardaia, The Laboratory of Quantitative and Qualitative Applications for the Economic, Social, and Environmental Promotion of Algerian Enterprises, Algeria

✉ KHATOUI.Mounir@univ-ghardaia.dz

ORCID  <http://orcid.org/0009-0000-1859-5311>

Received: 04-03-2024.

Accepted: 01-04-2024.

Published: 01-06-2024.

Abstract:

The emergence of Central Bank Digital Currencies (CBDCs) represents a major shift in the global financial landscape. This study examines the dual nature of CBDCs within the global financial system as a potential threat and opportunity. This study aims to study the benefits and risks of adopting digital currencies for central banks and their possible effects on global financial systems. The results revealed that CBDCs can enhance payment systems, financial inclusion, and monetary policy effectiveness. However, they also pose financial stability, privacy, and cybersecurity risks.

This study concluded that CBDCs represent an important innovation in digital finance and offer significant advantages. Still, their successful integration requires careful consideration of various challenges and balancing benefits and risks to lay strong foundations to counter these risks and take advantage of CBDCs' potential to promote a more inclusive and efficient financial system.

Keywords: CBDCs, benefits, risks, financial system, digital finance.

JEL Classification Codes : E42 ; E52 ; E58 ; O33

اعتماد العملة الرقمية للبنك المركزي: تهديد أم فرصة؟

منير خطوي¹ (*)

¹ الدكتوراه، أستاذ محاضر، جامعة غرداية، مخبر التطبيقات الكمية والنوعية للارتقاء الاقتصادي، الاجتماعي والبيئي

بالمؤسسات الجزائرية، الجزائر

KHATOULMounir@univ-ghardaia.dz



رابط ORCID : <http://orcid.org/0009-0000-1859-5311>

تاريخ النشر: 01-06-2024

تاريخ القبول: 01-04-2024

تاريخ الاستلام: 04-03-2024

ملخص:

يمثل ظهور العملات الرقمية للبنك المركزي تحولاً كبيراً في المشهد المالي العالمي، حيث تبحث هذه الدراسة في الطبيعة المزدوجة للعملات الرقمية للبنك المركزي داخل النظام المالي العالمي باعتبارها تهديداً وفرصة محتملة، إذ تهدف هذه الدراسة إلى دراسة الفوائد والمخاطر المرتبطة باعتماد العملات الرقمية للبنوك المركزية، وتأثيراتها المحتملة على الأنظمة المالية على مستوى العالم، حيث كشفت النتائج أن العملات الرقمية للبنوك المركزية يمكن أن تعزز أنظمة الدفع والشمول المالي وفعالية السياسة النقدية، ومع ذلك فإنها تشكل أيضاً مخاطر تتعلق بالاستقرار المالي والخصوصية والأمن السيبراني.

وقد خلصت هذه الدراسة إلى أن العملات الرقمية للبنوك المركزية تمثل ابتكاراً مهماً في التمويل الرقمي وتقدم مزايا كبيرة، لكن تكاملها الناجح يتطلب دراسة متأنية لمختلف التحديات وعمل موازنة دقيقة بين الفوائد والمخاطر بهدف وضع أسس قوية لمواجهة هذه المخاطر والاستفادة من إمكانات العملات الرقمية للبنوك المركزية لتعزيز نظام مالي أكثر شمولاً وكفاءة.

الكلمات المفتاحية: عملة رقمية للبنك المركزي؛ فوائد؛ مخاطر؛ نظام مالي؛ ابتكار؛ تمويل رقمي.

تصنيف JEL: E42 ; E52 ; E58 ; O33

1. INTRODUCTION

In the wake of the 21st century, the global economic landscape has been affected by many transformational forces, including digital transformation, financial crises, and shifts in consumer behavior. These changes have been accelerated by the Coronavirus pandemic 2019 (COVID-19), which emphasised the need for efficient, safe, and inclusive financial systems. Amid these developments, the emergence of CBDCs has emerged as a pivotal innovation in the monetary field by harnessing advances in computing and blockchain technologies and alternatives to traditional banknotes and coins to modernise payment systems, enhancing financial inclusion and enhancing the effectiveness of the monetary policy.

Despite the promising prospects for central banks' digital currencies, their adoption is fraught with challenges and complex uncertainties. Concerns about financial stability, privacy, cybersecurity, and the possibility of non-intermediation by commercial banks pose significant threats. In addition, the different methods of implementing CBDCs across other regions highlight the lack of consensus on the optimal design and operational frameworks for these currencies. Accordingly, this study aims to dissect these multifaceted issues and analyse CBDCs as a threat and opportunity to the global financial system.

This study also aims to explore the dual nature of CBDCs as a threat and opportunity to the financial ecosystem. It thus seeks to answer the following questions: What are the potential benefits and risks of adopting central banks' digital currencies? How could CBDCs affect monetary policy, financial stability, and financial inclusion? What lessons can be drawn from the historical precedents of financial innovations to guide the adoption of CBDCs?

By taking advantage of historical data and studying recent developments in digital finance, this research contributes to a deeper understanding of the potential economic effects of central banks' digital currencies. It seeks to explore optimal design options for CBDCs, considering the balance between benefits and risks to support a more inclusive and efficient financial system. The paper is organised as follows: The first section discusses the literary review of the economic effects of central banks' digital currencies. In contrast, the second section addresses the conceptual framework of central banks' digital currencies. The third section reviews the reality of the issuance of CBDCs globally, and the fourth section presents the potential benefits of central bank digital currencies. The section concludes by presenting the challenges and risks of the Central Bank's digital currency.

2. LITERATURE REVIEW

CBDCs have emerged as an important topic of discussion and research in recent years, as many central banks worldwide are considering issuing CBDCs due to the potential benefits and risks they represent. This literature review analyses this research on the opportunities and threats associated with adoption.

Research highlights several benefits of CBDC adoption and the potential for

CBDC issuance to reduce reliance on physical cash and expenses related to printing, storing, and transporting cash (Pelagidis & Kostika, 2022). CBDCs also promise to expand financial inclusion by facilitating access to central bank money for unbanked communities through digital wallets (Rehman et al., 2023). In addition, CBDCs can promote monetary policy transmission by directly influencing household and business investment decisions (Temperini et al., 2024). Cryptocurrencies also enable central banks to make convenient cross-border payments and convert currencies for global transactions (Cesaratto & Febrero, 2023).

However, adopting digital currencies for central banks is not without risks, financial stability concerns, and the possibility of non-intermediation in commercial banks. Points (Kovanen, 2019) out that CBDCs can improve oversight but pose risks to financial stability, and the intensive conversion of individual bank deposits into CBDCs can restrict the provision of private credit and necessitate changes in oversight (Nabilou, 2020). Operationally, complex cryptocurrency platforms increase vulnerabilities to cyberattacks, fraud, and money laundering, which central banks must control (Ozturkcan et al., 2022). CBDCs also raise important privacy questions that have been explored in research. (Ballaschk & Paulick, 2021) discuss the balance between privacy rights and financial oversight in CBDC design.

In conclusion, scientific analysis reveals that CBDCs carry promises and risks. They provide opportunities to enhance financial inclusion, payment efficiency, and monetary control. However, design options include many stability risks, technical barriers, and privacy. As CBDCs continue to advance, further research on managing these opportunities and challenges will remain vital.

3. Theoretical Framework for Central Bank Digital Currencies

CBDCs are an important development in digital cash and play an important role in combining the benefits of traditional cash with the advantages of digital technology to enhance the financial system and the financial environment.

3.1 The Definition of Central Bank Digital Currencies

It is digital money issued by the Central Bank denominated in the national unit of account. It is designed to be used as a medium of exchange, just like physical cash, but in digital form. It differs from cryptocurrencies such as Bitcoin and Ethereum because it is issued and supported by a central authority, ensuring its stability and trustworthiness. (Boar & Wehrli, 2021, p. 4)

In general, CBDCs can be defined as a form of digital money denominated in the national unit of account, which is a direct responsibility of the Central Bank that can be either for wholesale use (by financial institutions) or retail use (by households and businesses; and the general public). (Auer et al., 2022, p. 699)

3.2 Characteristics of CBDCs

CBDCs have several distinct characteristics compared to other types of money, and here we will address some of these important characteristics that distinguish CBDCs:

3.2.1 Issued by the Central Bank

The issuance of CBDCs means that the CBDC is issued and regulated by the Central Bank in the country so that it is considered an official means of payment recognised and supported by the government and financial authorities in the country, making it a means of payment with high legitimacy and trust, which increases its acceptance and use. In financial and economic transactions.

3.2.2 Digital form of currency

CBDCs are the digital version of a country's fiat currency and represent a new form of money that exists only in digital or fully electronic form, which means that they exist and circulate electronically only without the presence of paper or metal copies of them, which are stored and processed through computing systems and electronic networks. CBDCs refer to digital forms of central bank money that can be widely held and used. (Das, 2023, p. 6)

3.2.3 The value associated with the official currency

The value of the digital currency issued by the Central Bank is directly related to the value of the country's current fiat currency, which ensures the stability of the purchasing value of the digital currency and thus builds confidence in it as a reliable and stable means of payment and enhances confidence in the financial system as a whole.

3.2.4 Transparency and traceability

It means that all financial operations carried out using these currencies can be tracked and monitored accurately and transparently, allowing central banks and supervisory authorities to understand and monitor how money flows and moves in the financial system and to ensure that these operations comply with financial laws and regulations, enhance confidence in the financial system, and stimulate the adoption of digital technology in payment and financial transfer operations.

3.2.5 Programmability

Flexibly customise and modify their functions and policies according to specific needs. CBDCs can program them with AI and smart contracts to implement various policies and conditions. CBDCs can also be designed by issuing central banks to prevent or restrict their use outside the issuing country. (United Nations, 2023, p. 23)

3.3 Motives for issuing CBDCs

There are several motives behind the issuance of digital currencies to the Central Bank, the most important of which are summarised below:

3.3.1 Modernization of the financial system

It refers to the possibility of central banks being driven to issue their digital currencies (CBDCs) to modernise the current financial system and keep pace with technological developments in the digital economy, modernising the financial infrastructure and providing a safe and effective digital payment method. CBDCs could increase operational efficiency in the financial system, particularly in terms of payment processing and money transfers. (Das, 2023, p. 9)

3.3.2 Reducing transaction costs

It means reducing the expenses associated with printing and processing paper

money. Using paper money requires printing banknotes and coins and transportation, distribution, and storage costs. Using digital currencies can avoid paper money costs, saving costs for central banks and financial institutions that manage these digital currencies.

3.3.3 Implementing monetary policy

The central Bank's digital currencies can facilitate the implementation of monetary policy in real-time and automatically by the central Bank accurately tracking the movement of cash and implementing its monetary policies immediately and automatically. This allows accurate interventions to manage the monetary quantity and the amount of credit based on real-time economic and financial needs, enhancing monetary policy's effectiveness and contributing to economic stability.

3.3.4 Financial Stability

CBDCs can contribute to maintaining financial stability by providing a secure and reliable digital payment system, as the latter allows individuals and institutions to use it with confidence in payment and transfer transactions. This is achieved by establishing and improving a sound monetary risk monitoring mechanism and clarifying the list of regulatory responsibilities, ensuring the standardised application of the central bank's digital currency at its source, and formulating a prudent contingency plan for the risks of the central bank's digital currency helps improve awareness and ability for risk prevention. This bolsters confidence in the financial system overall and contributes to enhancing financial stability. (Zhang, 2020, p. 345)

3.3.5 promotion of competition

CBDCs can encourage competition and innovation in digital payment by providing new, safe, and effective payment methods that compete with existing payment methods such as cash, bank deposits, and private digital currencies. They also reduce transaction costs and increase efficiency using blockchain technology that provides a secure and transparent infrastructure for financial transactions, especially in border transactions and money transfers. This leads to lower costs and increased efficiency, encouraging competition and innovation in the financial sector. (Lannquist, 2023, p. 21)

4. The reality of issuing CBDCs globally

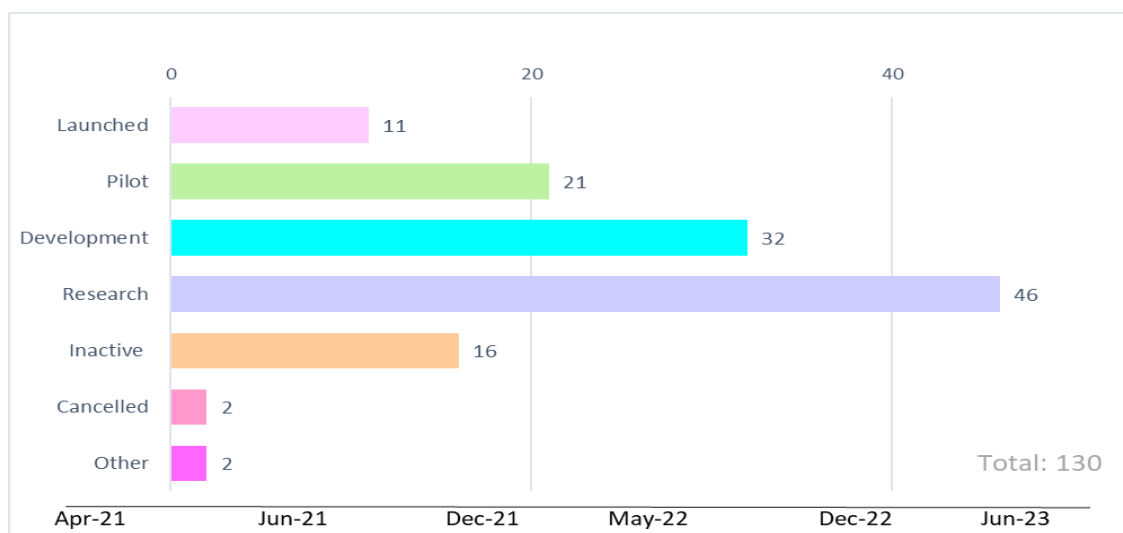
In recent years, CBDCs have witnessed increasing interest globally, as many countries are exploring the possibility of issuing them to modernise financial systems and enhance efficiency the majority of these countries are still in the stages of research and development, with the presence of some countries that have already launched their digital currencies, as this global trend towards CBDCs shows the need for a more sophisticated and comprehensive financial system, and the commitment of countries to keep pace with technological developments in the financial sector.

4.1 Overview of CBDC issuance projects around the world

According to the Atlantic Council¹ data, 130 countries will reveal projects to create digital currencies for their central banks, which account for 98% of global GDP. This data also shows that most countries are still in the research phase to explore digital currencies for central banks. Since June 2023, 46 countries have been in the research phase, followed by 32 countries in the development phase, most of which are advanced economies in Europe and North America, and 21 countries in the pilot phase, where they test CBDCs in controlled environments to assess their practical applicability before launching them on a large scale.

While 11 countries have already launched retail CBDCs, such as Nigeria, Bahamas, Eastern Caribbean countries, and Jamaica, only two have cancelled their CBDC projects, possibly due to unfavourable risk assessments or technological barriers, while two others were at other stages (Fig.1) which may include alternative CBDC projects or unique CBDC methods.

Fig.1. Number of countries and currency unions exploring CBDCs



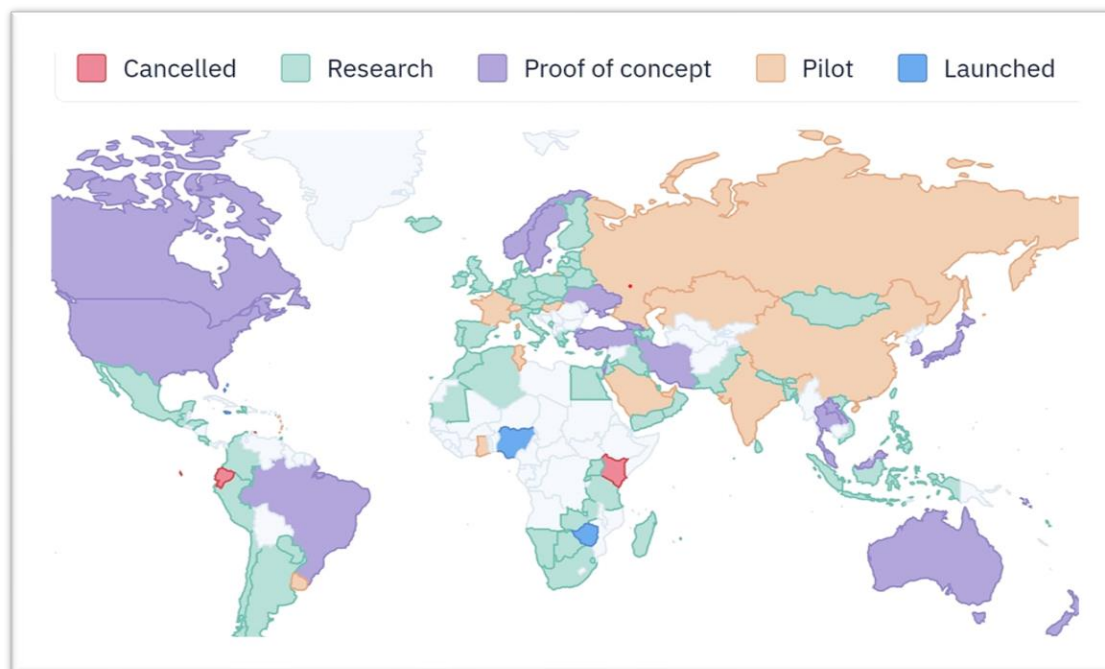
Source: Atlantic Council, Central Bank Digital Currency Tracker, <https://www.atlanticcouncil.org/cbdctracker/>.

These data indicate that CBDCs are still in the early stages of development and adoption. However, the growing number of countries and currency unions exploring CBDCs indicates an ever-increasing interest in CBDCs to modernise and digitise financial systems.

4.2 Geographical Distribution of CBDCs Issuance Projects

Many countries are studying or implementing projects to issue digital currencies to the Central Bank, as most of these countries are still in the early stages of research and development. Still, some of them have already launched currencies, and here are some examples of the distribution of CBDC projects by geographical regions (Fig.2):

¹Atlantic Council, Central Bank Digital Currency Tracker, <https://www.atlanticcouncil.org/cbdctracker/>.

Fig.2. Status of CBDCs issuance projects around the world – February 2024

Source: CBDC Tracker, Today's Central Bank Digital Currencies Status, <https://cbdctracker.org>

4.2.1 Europe

According to "CBDC Tracker²" data, many European countries are still in the research and development stages of exploring central Bank digital currencies. This includes exploring the feasibility, technology, and potential effects of CBDCs on economies. By 2024, 30 countries were in the research stage. 5 countries were in the "Proof of Concept" stage, and 04 were in the "Pilot" stage. Only two countries have cancelled their CBDCs projects, and the European Central Bank (ECB) is working with national central banks in the euro area to consider the possible issuance of a digital euro., which was marked by the start of the preparation phase on November 1, 2023, after completing the two-year investigation phase, and has now moved to the preparation phase. This phase follows a comprehensive two-year investigation into the design and distribution models of the digital euro. The European Central Bank will also conduct tests and experiments to develop the digital euro that meets the European system's requirements and users' needs. After two years, the Governing Council of the European Central Bank will decide whether to move to the next stage of preparations, paving the way for the possible issuance of a digital euro in the future. (European

² CBDC Tracker, Today's Central Bank Digital Currencies Status, <https://cbdctracker.org/>

Central Bank, 2023)

4.2.2 Asia

China launched a pilot project for the digital yuan (e-CNY) in 2019 and expanded to 23 cities in 2022. India plans to launch a retail CBDC called the "digital rupee" in 2023. Thailand aimed to establish a retail Central Bank pilot project in 2023. Another 12 Asian economies, such as Japan, Korea, Malaysia, and Singapore, have experimented with central bank digital currencies. Meanwhile, 12 other countries, such as Bhutan, the Lao People's Democratic Republic, and Nepal, are in the research phase. Pacific Island countries are also showing interest in CBDCs or stablecoins. These countries have taken great strides in utilising technology and have seen an uptick in the adoption of digital financial services to promote financial inclusion despite gaps in infrastructure and capabilities. (Loukoianova et al., 2018, p. 5)

4.2.3 The Americas

Latin America and the Caribbean (LAC) holds a leading position in the adoption of digital money, with the Bahamas pioneering the introduction of the CBDC with the sand dollar in 2020, followed by the Eastern Caribbean Currency Union (ECCU) and Jamaica (Figure 4), and four Latin American countries – Brazil, Argentina, Colombia, and Ecuador – ranked in 2022 among the top 20 countries in the adoption of crypto assets globally. (Rina Bhattacharya, Dmitry Vasilyev, 2023)

The Federal Reserve is actively researching and experimenting with digital currencies and exploring the potential benefits and risks of issuing a CBDC in the United States. The Fed has not yet decided whether to issue a CBDC. The Bank of Canada's research focuses on delving deeper into designing future digital payment products and services and the potential issuance of a CBDC to uncover more of the challenges and opportunities associated with these new technologies. (Sutton-lalani & Hernandez, 2023, p. 15)

4.2.4 Africa

Nigeria launched the e-Naira in October 2021, and many central banks in Africa and sub-Saharan Africa are considering the possibility of creating a digital currency, as in Rwanda and Kenya, or piloting, as in South Africa and Ghana (Fig.2). The South African Reserve Bank (Otaviano Canuto, 2022) is piloting a wholesale CBDC, which can only be used by financial institutions for interbank transfers, as part of the second phase of the Al-Khokha project. The country is also involved in a cross-border pilot project with central banks in Australia, Malaysia, and Singapore, while the Bank of Ghana is testing a general-purpose or retail CBDC, e-Cedi, and in North Africa, (Fuje et al., 2022) two central banks are currently studying the possibilities of digital currency: Morocco and Tunisia.

4.3 Cross-border CBDC projects

According to data from the Atlantic Council, there are currently 16 cross-border CBDC projects for wholesale and retail purposes. These projects involve central banks from different countries working together to develop CBDCs that can be used for cross-border payments. The goal of these projects is to make payments cross-border. Frontiers are faster, cheaper, and more efficient.

According to a report issued by Juniper Research, "the value of digital currency payments to central banks will reach \$213 billion annually by 2030, up from just \$100 million in 2023". (Payments, 2023, p. 13) This reflects the radical growth of digital currency payments to banks. Domestic and cross-border centralisation: The following table includes the various cross-border CBDC projects currently being implemented:

Table 1. Central Bank Digital Currency Cross-Border Projects

Project	Countries Involved	Use Case	Status	Expected Completion
Project mBridge	China, Hong Kong, Thailand, UAE	Wholesale	Pilot phase	2023
Project Dunbar	Australia, Singapore, Malaysia, South Africa	Wholesale	Building prototypes	Mar-2022
Project Sela	Hong Kong, BIS	Retail	Development	End of 2022
Project Icebreaker	Norway, Sweden, BIS	Retail	Development	2023
Project Mariana	France, Switzerland, Singapore, BIS	Wholesale	Development	Oct-2023
Project Jura	France, Switzerland	Wholesale	Experimentation	-
Onyx/Multiple wCBDC	France, Singapore	Wholesale	Completed	2021
Project Rosalind	United Kingdom, BIS	Retail	Prototype development	-
Project Aurum	Hong Kong, BIS	Retail and Wholesale	Prototype released	2021
Project Helvetia	Switzerland, BIS	Wholesale	Integrated to banking system	Jan-2022
Project Jasper	Canada, UK, Singapore	Wholesale	Concluded	-
Project Aber	Saudi Arabia, UAE	Wholesale	Pilot concluded	2019

Source: By the author from CBDCs Tracker data (Atlantic Council) –Jan. 2024

The above table provides an overview of the various CBDCs cross-border initiatives comprising 16 projects between 09 projects for wholesale purposes, 04 for retail purposes, and 03 for wholesale and retail purposes. These projects, led by

different countries and central banks, focus primarily on developing and piloting digital currency platforms for wholesale and retail purposes for various uses such as cross-border payments, cybersecurity impacts, and wholesale currency exchange. This indicates global interest and cooperation in developing and exploring CBDCs for efficient and secure financial transactions.

For example, the mBridge and Dunbar projects focus on wholesale applications, indicating a focus on large-scale cross-border financial transactions. The participation of multiple countries in these projects, such as China, Hong Kong, Thailand, the United Arab Emirates, Australia, Singapore, Malaysia, and South Africa, reflects a global collaborative effort to revolutionise traditional financial systems. The Sela project and the Icebreaker project highlight the retail aspect of CBDCs and showcase the potential of these digital currencies in daily consumer transactions.

The diverse cases of these projects, from pilot to development stages, illustrate the exploratory nature of this financial technology. These projects are important steps toward the future of digital finance and are likely to reshape how cross-border payments and financial transactions are conducted globally.

5. Potential Benefits of CBDCs

CBDCs offer a range of potential benefits and impacts on various aspects of the financial system and monetary policy. Here are some of the key benefits and impacts of CBDCs:

5.1 Enhancing the efficiency of the payment system

CBDCs enhance the efficiency of the payment system by providing a secure payment method using blockchain technologies, which ensures the safety of financial transactions and makes it difficult for fraud or manipulation to occur. CBDCs also simplify the payment process by eliminating the need for intermediaries such as banks and simplify cross-border payments, which reduces complexity and transaction costs and makes them faster and low-cost by reducing dependence on cash and abandoning the cost of printing, storing, and transporting physical currencies (Karam, 2023). This is what the head of the International Monetary Fund (IMF), Kristalina Georgieva, stated at the Singapore Fintech Festival: CBDCs can replace cash, but their adoption may take some time, so digital currencies provide central banks with a safe and less expensive alternative to money (IMF, 2023). CBDCs generally improve the efficiency and security of payment systems by providing a secure, fast, low-cost payment method and improving cross-border transactions.

5.2 Promoting financial inclusion

According to the 2021 Global Financial Inclusion Survey, 1.4 billion people worldwide still do not have a bank account and are outside the formal financial system. Access to digital payments is a gateway to other financial services such as savings, credit, and insurance and a major first step towards financial inclusion on a larger scale. People with access to digital payments can send and receive money from other digital financial service providers more efficiently, enabling them to expand their access to a wide range of formal financial products and services, which can meet their own needs

and improve financial safety. (Lannquist, 2023, p. 2)

CBDCs generally have the potential to bridge the gap between unbanked and underbanked populations, promote financial inclusion, and enable individuals to access high-quality and affordable digital financial services.

5.3 Strengthening monetary policy

CBDCs enhance the effectiveness of monetary policy by providing central banks with more direct control over the money supply and interest rates and enable central banks to implement and transfer monetary policy more efficiently, as they can directly affect the circulation and availability of digital currency by reducing brokerage costs and increasing the speed of transactions, allowing central banks to manage liquidity more effectively and respond to economic conditions, in addition to supporting the implementation of unconventional monetary policy measures by allowing differentiated interest rate schemes based on the size of deposit balances and incentivising consumers to maintain effective liquidity levels and reduce alternative opportunity costs. Additionally, a CBDC's substitutability with deposits could improve the transmission of monetary policy. (Dionysopoulos et al., 2024, p. 10)

In general, the issuance of CBDCs is important in strengthening monetary policy by strengthening control over the money supply, improving the transmission mechanism, enabling more efficient implementation of policy measures, and providing better monitoring capabilities for central banks.

5.4 Reducing transaction costs

It refers to the possibility of using CBDCs to reduce the costs associated with dealing with paper money and paper bank accounts and the costs of cross-border payments by providing an effective digital payment method. CBDCs can also contribute to reducing the costs associated with cash exchange and traditional bank accounts, as well as the costs of international payments, which benefits individuals and companies by reducing the costs associated with financial operations and improving the efficiency of the financial system in general.

5.5 Enhancing Safety and Reducing Risk

CBDCs can enhance security and reduce the risk of fraud by adopting advanced encryption measures and strong authentication that help verify the identity of users and ensure that transactions are carried out legitimately and securely. CBDCs also provide a safe and risk-free way to store value as a direct responsibility of the Central Bank, unlike traditional bank deposits subject to credit and liquidity risks (Lannquist, 2023, p. 15). CBDCs provide a safe and reliable environment for storing value and carrying out financial operations safely and effectively, reducing the risk of fraud and enhancing confidence in the financial system.

6. Challenges and Risks of the CBDCs

Challenges and risks associated with CBDCs include:

6.1 Regulatory and legal challenges

The introduction of centralised digital currencies may require changes to existing regulatory frameworks and legal structures, as strict legal and regulatory regulations must be enacted to ensure compliance with financial laws, protect

consumers' rights, and combat financial crime. A diverse array of laws, measures, and requirements are already in existence to safeguard the traditional banking sector and consumers against cyber-attacks. These legal frameworks and initiatives aim to enhance cybersecurity and protect the financial and personal data of individuals and institutions. (Gault, 2019, p. 33)

6.2 Operational Risks

Centralised digital currencies face operational risks such as system reliability and cybersecurity threats that can cause system disruption, manipulation, or theft of data or funds, which requires continuous updating of security technologies and periodic system monitoring to detect any security vulnerabilities.

6.3 Privacy Policy

Centralised digital currencies raise privacy concerns related to the collection and use of personal data related to the right of users to maintain the confidentiality of their data and transactions, as it must be ensured that transactions in digital currency are confidential and protected without leakage or violation of personal data, and this can be achieved through the application of strict privacy and protection policies including encryption techniques and specific access procedures. The design of CBDCs is expected to require balancing public privacy, especially with the continued evolution of data protection legislation and reducing illegal activity. (ECB & BIS, 2020, p. 6)

6.4 Transferring monetary policy

Technical errors, cyber-attacks, and violations of user data can pose risks to the reputation of the Central Bank, and during periods of financial stress, the risk of individuals transferring their money from commercial bank deposits to central digital currencies can occur, which may lead to disruptions in the banking system and the impact of monetary policy transfer.

6.5 Financial Stability

Centralised digital currencies can affect the financial system's stability by individuals withdrawing their money from banks without effectively limiting centralised digital currency holdings. Central banks must manage these risks to maintain stability in the financial system

6.6 Cross-border effects

The introduction of centralised digital currencies can have cross-border effects, including challenges related to international cooperation, exchange rate stability, and capital flows, as central banks must consider these effects when designing and implementing centralised digital currencies. Currently, central banks are focused on employing CBDCs for domestic use within the borders of the issuing jurisdiction. However, it may be possible in the future to design CBDCs that could be utilised across international borders. This international dimension could be important for bolstering international trade and facilitating cross-border payments and settlements more efficiently. (Das, 2023, p. 7)

7. CONCLUSION

The analysis presented in this study highlights the dual nature of CBDCs as a threat and an opportunity within the global financial system, as the emergence of CBDCs represents an important monetary innovation and a revolution in the financial landscape by modernising payment systems, enhancing financial inclusion, and improving the effectiveness of monetary policy. However, the adoption of CBDCs is not without challenges and risks; their successful adoption requires continued research and study to address these complexities to ensure that the full potential of CBDCs in promoting a more inclusive, efficient, and resilient financial system is realised.

Through this study, the following results were reached:

- CBDC projects are advancing rapidly, with more than 130 countries exploring retail, wholesale, or cross-border central bank digital currencies. However, most initiatives are still in early or experimental research stages, indicating increasing interest in this type of currency, but with caution.
- CBDCs present significant opportunities to modernise payment systems, expand financial inclusion, promote monetary policy transition, drive innovation, reduce transaction costs, promote competition, and provide central banks with more oversight and control.
- Cryptocurrencies provide central banks with many potential benefits but threaten financial stability, cybersecurity, privacy rights, and lack of banking intermediation.
- The optimal design of CBDC involves carefully balancing the benefits and risks of financial stability, user privacy, cybersecurity, and its effects on the banking system.
- Although CBDCs are still evolving, they represent a pivotal innovation in developing digital finance.
- Cross-border CBDC projects between central banks indicate increased cooperation in leveraging CBDCs for efficient global transactions.

While CBDCs present major efficiency opportunities, central banks should take an incremental, collaborative, and cautious approach centred on managing risks. With prudent advancements in research, based on this study, I recommend four key areas as they evaluate CBDCs:

- Ensure financial stability and cybersecurity by rigorously testing CBDCs to safeguard monetary and financial stability while investing heavily in cybersecurity measures to protect the system's financial infrastructure;
- Preserve privacy rights by designing CBDC systems to preserve user privacy and prevent excessive government oversight, which could undermine public trust. Strict data governance policies should be implemented;
- Support the banking system by closely coordinating with commercial banks to understand how CBDCs could impact their intermediation and lending capacities. Implement policies to mitigate risks of disintermediation;
- Foster global cooperation by partner with other central banks and international economic organisations to share research, align standards and policies, and enable efficient cross-border CBDCs transactions. Cooperation will facilitate broader adoption.

8. Bibliography List:

1. Books:

- United Nations. (2023). *Crypto Assets and Central Bank Digital Currencies: Potential Implications for Developing Countries*. In *Crypto Assets and Central Bank Digital Currencies: Potential Implications for Developing Countries*. United Nations. <https://doi.org/10.18356/9789210026178>

2. Journal article:

- Auer, R., Frost, J., Gambacorta, L., Monnet, C., Rice, T., & Shin, H. S. (2022). Central Bank Digital Currencies: Motives, Economic Implications, and the Research Frontier. *Annual Review of Economics*, 14, 697–721. <https://doi.org/10.1146/annurev-economics-051420-020324>
- Ballaschk, D., & Paulick, J. (2021). The public, the private and the secret: Thoughts on privacy in central bank digital currencies. *Journal of Payments Strategy & Systems*, 15(3), 277–286.
- Boar, C., & Wehrli, A. (2021). Ready, steady, go?-Results of the third BIS survey on central bank digital currency. *BIS Papers*, 114, 77–82.
- Cesaratto, S., & Febrero, E. (2023). Central Bank Digital Currencies: a proper reaction to private digital money? *Review of Keynesian Economics*, 11(4), 529–553. <https://doi.org/10.4337/roke.2023.04.05>
- Das, M. (2023). Implications of Central Bank Digital Currencies for Monetary Policy Transmission. *Fintech Notes*, 2023(010), 1. <https://doi.org/10.5089/9798400252792.063>
- Dionysopoulos, L., Marra, M., & Urquhart, A. (2024). Central bank digital currencies: A critical review. *International Review of Financial Analysis*, 91(March 2023), 103031. <https://doi.org/10.1016/j.irfa.2023.103031>
- ECB, & BIS. (2020). Central bank digital currencies: foundational principles and core features report no. 1 in a series of collaborations from a group of central banks. *Bank of International Settlements*, 1. <https://www.bis.org/publ/othp33.pdf>
- Fuje, H., Quayyum, S., & Ouattara, F. (2022). More African Central Banks Are Exploring Digital Currencies. *IMFBLOG*. June, 23.
- Gault, B. P. (2019). Missing Key: In *Body as Landscape, Love as Intoxication*. <https://doi.org/10.2307/j.ctvpwhfs4.6>
- Kovanen, A. (2019). Competing With Bitcoin - Some Policy Considerations for Issuing Digitalized Legal Tenders. *International Journal of Financial Research*, 10(4), 1. <https://doi.org/10.5430/ijfr.v10n4p1>
- Lannquist, A. (2023). Central Bank Digital Currency's Role in Promoting Financial Inclusion. *Fintech Notes*, 2023(011), 1. <https://doi.org/10.5089/9798400253331.063>
- Loukoianova, E., Yang, Y., Guo, S., Hunter, L., Jahan, S., Jamaludin, F., & Schauer, J. (2018). Financial Inclusion in Asia-Pacific. *Departmental Papers / Policy Papers*, 18(17), 1. <https://doi.org/10.5089/9781484371015.087>
- Nabilou, H. (2020). Testing the waters of the Rubicon: the European Central Bank and central bank digital currencies. *Journal of Banking Regulation*, 21(4), 299–314. <https://doi.org/10.1057/s41261-019-00112-1>
- Ozturkcan, S., Senel, K., & Ozdinc, M. (2022). Framing the Central Bank Digital Currency (CBDC) revolution. *Technology Analysis & Strategic Management*, 1–18. <https://doi.org/10.1080/09537325.2022.2099261>

- Payments, F. O. F. (2023). *FUTURE OF PAYMENTS 2023 CHARTING THE COURSE TO SEAMLESS GLOBAL PAYMENTS*.
- Pelagidis, T., & Kostika, E. (2022). Investigating the role of central banks in the interconnection between financial markets and cryptoassets. *Journal of Industrial and Business Economics*, 49(3), 481–507. <https://doi.org/10.1007/s40812-022-00227-z>
- Rehman, M. A., Irfan, M., Naeem, M. A., Lucey, B. M., & Karim, S. (2023). Macro-financial implications of central bank digital currencies. *Research in International Business and Finance*, 64, 101892. <https://doi.org/10.1016/j.ribaf.2023.101892>
- Rina Bhattacharya, Dmitry Vasilyev, and M. V. (2023). *Interest in Central Bank Digital Currencies Picks Up in Latin America and the Caribbean While Crypto Use Varies*. International Monetary Fund.
<https://www.imf.org/en/News/Articles/2023/06/22/cf-interest-in-cb-digital-currencies-picks-up-in-latam-the-caribbean-while-crypto-use-varies>
- Sutton-lalani, A., & Hernandez, S. (2023). *Redefining Financial Inclusion for a Digital Age : Implications for a Central Bank Digital Currency*.
<https://doi.org/https://doi.org/10.34989/sdp-2023-22>
- Temperini, J., D’Ippoliti, C., & Gobbi, L. (2024). Is the time ripe for helicopter money? Growth impact and financial stability risks of outright monetary transfers. *Structural Change and Economic Dynamics*, 69, 24–36.
<https://doi.org/10.1016/j.strueco.2023.11.003>
- Zhang, X. (2020). Opportunities, challenges and promotion countermeasures of central bank digital currency. *Proceedings - 2020 Management Science Informatization and Economic Innovation Development Conference, MSIEID 2020*, 343–346.
<https://doi.org/10.1109/MSIEID52046.2020.00072>

3. Internet websites:

- Atlantic Council (2023), Central Bank Digital Currency Tracker, Geoeconomics Center, <https://www.atlanticcouncil.org/cbdctracker/> (consulted on 07/01/2024).
- CBDC Tracker(2023), Today's Central Bank Digital Currencies Status, <https://cbdctracker.org/> (consulted on 19/02/2024).
- European Central Bank. (2023). *Eurosystem proceeds to next phase of digital euro project*.
<https://www.ecb.europa.eu/press/pr/date/2023/html/ecb.pr231018~111a014ae7.en.htm>
[1](#) (consulted on 09/01/2024).
- IMF. (2023). *The Digital Finance Voyage: A Case for Public Sector Involvement*. IMF.
<https://www.imf.org/en/News/Articles/2023/11/15/sp-111423-the-digital-finance-voyage-a-case-for-public-sector-involvement> (consulted on 29/11/2024).
- Karam, A. A. (2023). *Central Bank Digital Currency (CBDC) and blockchain enable the future of payments*. <https://www.ibm.com/blog/central-bank-digital-currency-cbdc-and-blockchain-enable-the-future-of-payments/> (consulted on 03/12/2024).