



The Emergence of Innovative Payment Systems in Algeria:

A Case Study of CBDC

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Abstract

- ✓ Financial inclusion is a central issue insofar as it allows individuals to benefit from access to basic financial services, such as savings, loans, insurance and means of payment. The establishment of a digital currency directly issued by the central bank (CBDC) is attracting growing interest and can offer many potential benefits for financial inclusion. In this article, we will examine the characteristics of CBDC and the potential role it could play in improving financial inclusion, analyzing the workings, advantages and challenges of this technology. We will also discuss past experiences and current projects in this area, to better understand the future prospects of CBDC as a solution for the Algerian market.
- ✓ Central Bank Digital Currency, Digital Currency, CBDC, Financial inclusion, Banking

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1. INTRODUCTION

Financial inclusion is a matter of social justice and economic development (Beck et al., 2011). Despite the progress made in recent years, over two billion people worldwide still lack access to basic financial services. For these populations, obtaining bank accounts, means of payment, or loans poses a major challenge, limiting their ability to save, invest, and protect themselves against economic risksⁱ.

Algeria is currently experiencing a new growth dynamic, primarily driven by the accelerated economic development of the banking sector and the financial ecosystem. This marks the era of financial inclusion. However, one of the challenges faced by Algeria in this context is that a significant portion of the Algerian population is unbanked, with a banking rate not exceeding 44%ⁱⁱ. These individuals without bank accounts must manage their money using informal mechanisms. According to the Ministry of Finance, one-third of the money supply circulates in fiat currency, amounting to approximately 7,000 billion dinarsⁱⁱⁱ, roughly a third of the GDP (Gross Domestic Product). Informal mechanisms may be less secure, less reliable, and more costly than formal methods. In response to this low level of financial inclusion, the Algerian government has initiated the digital payments project by moving towards adopting a digital form of currency, with the Central Bank of Algeria overseeing issuance, management, and control under the name "Algerian Digital Dinar," considered a Central Bank Digital Currency (CBDC).

The implementation of a Central Bank Digital Currency (CBDC) appears to be an innovative and promising solution to enhance financial inclusion. Unlike private digital currencies, such as cryptocurrencies, a CBDC would be issued and backed by the central bank of a country, ensuring its security and stability. It could also offer benefits in terms of efficiency, transparency, and cost-effectiveness for financial transactions.

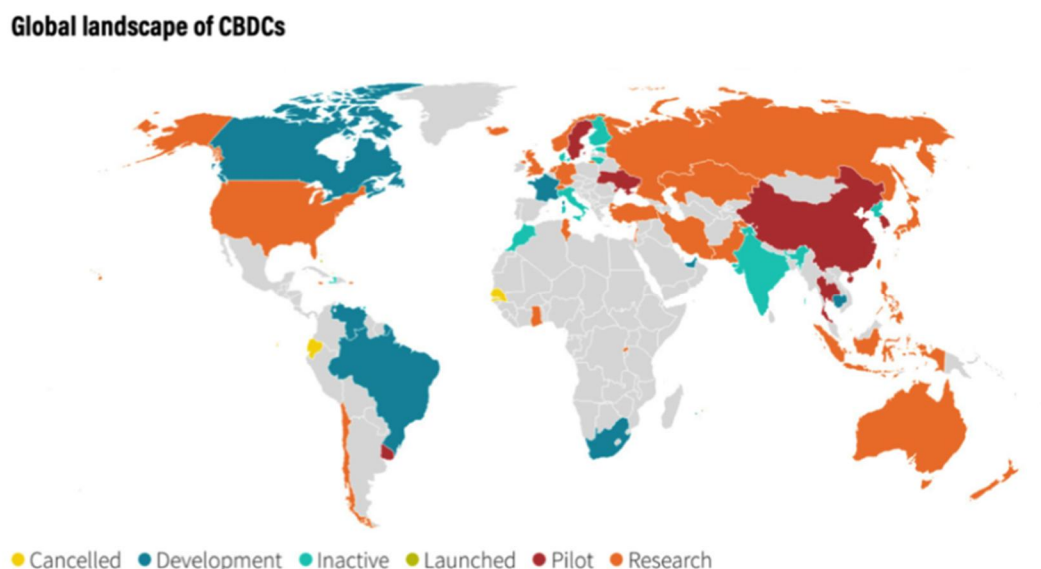
The CBDC could particularly facilitate access to financial services for people living in isolated regions or facing difficulties obtaining identification documents or permanent

addresses. However, the implementation of a CBDC also poses significant challenges, including regulatory, security, and governance aspects. Therefore, it is crucial to carefully assess the benefits and risks associated with this technology and work closely with financial sector stakeholders to ensure its success.

2. What is Central Bank Digital Currency (CBDC) ?

A Central Bank Digital Currency (CBDC), also known as a digital fiat currency or digital base money, is a new form of digital fiat currency developed, issued, managed, and controlled by the central banks of a country or monetary zone. Like fiat currencies, central bank digital currencies will be used for secure and rapid transactions. A 2021 study by the Bank for International Settlements (BIS) shows that 86% of central banks worldwide are actively studying the potential of CBDCs, with 60% already in the experimentation stage, and 14% deploying pilot projects. PwC's audit firm further reveals that since 2014, over 60 central banks have explored various forms of central bank digital currencies^{iv}.

Fig.1. Development of CBDC worldwide



Source: Reuters Research, Harvard Kennedy School Belfer Center & Atlantic Council

3. Are CBDCs Cryptocurrencies?

CBDCs are exclusively proposed in digital form through a shared ledger, prompting the question of whether they qualify as cryptocurrencies. Cryptocurrencies are decentralized digital currencies that use distributed ledger technology (blockchain) to record all transactions and create new units of currency. Well-known cryptocurrencies include Bitcoin, Ethereum, and Ripple. Digital currencies are forms of currency that exist solely in electronic form and are not physically issued as banknotes or coins. CBDCs are also forms of digital currencies in the sense that they are both digital forms of money. However, CBDCs are issued and regulated by central banks. A centralized currency cannot, by nature, be considered a cryptocurrency^v.

4. Characteristics of Central Bank Digital Currencies (CBDC)

Central bank digital currencies exhibit all the characteristics of fiat currencies except the physical aspect. They are considered a digital representation of the physical currency issued by a central bank^{vi}.

The rise of private cryptocurrencies, such as Libra, Bitcoin, Ethereum, etc., developed by private companies and certain social media giants like GAFAM^{vii} in the West or BATX^{viii} in China, has led some governments to instruct their central banks to consider how to develop a publicly usable digital currency.

Cryptocurrencies, which emerged in 2009 with the famous "Bitcoin," are entirely virtual digital currencies used for online transactions, relying on blockchain technology^{ix}. These currencies, stored in digital wallets, are not issued by any central bank of a sovereign state. They pose a real threat to the sovereignty and financial stability of countries because their money supply is regulated by a computer mechanism owned by private companies^x.

According to a study published by the University of Cambridge, the percentage of cryptocurrency users increased by 189% in the first quarter of 2020 compared to the

same period in 2019. The world has around 191 million active accounts on various cryptocurrency platforms, excluding holders of private digital or physical wallets^{xi}.

5. Operation of CBDC

Currently, in all countries worldwide, central currency circulates in two forms^{xii}:

- ☞ Coins and banknotes, forming what is known as fiat currency.
- ☞ Sums deposited by commercial banks in the accounts they hold with the central bank. Each commercial bank has an account with its country's central bank to obtain banknotes and also because the central bank requires it to leave reserves (mandatory reserves). This account also serves for lending operations that the central bank grants to commercial banks as part of its monetary policy.

The combination of "amounts placed by commercial banks in their accounts with the central bank" and "amount of coins and banknotes in circulation" equals the "total amount of central bank money." Central bank money represents a claim on the central bank. In concrete terms, when someone possesses a banknote, the central bank guarantees its nominal (or face) value; a banknote of 2000 dinars will always be redeemed, through a commercial bank, for a value of 2000 dinars.

On the other hand, the balances recorded on customers' accounts in commercial banks or payment institutions do not correspond to central bank money but rather to commercial bank money. Commercial banks create this money when they grant credits to their clients and credit their accounts with the amount of these credits. This also applies when they credit the accounts of clients who deposit banknotes or checks or receive wire transfers. In these situations, clients hold a claim against the commercial bank.

6. Opportunities of Central Bank Digital Currencies (CBDC)

The launch of CBDCs will lead to reduced transaction costs and improved profitability for banks, making the financial system more efficient and cost-effective. CBDCs can decrease transaction costs for consumers and businesses by eliminating transaction fees

associated with credit and debit card payments, potentially stimulating consumption and overall economic activity^{xiii}.

CBDCs, backed by central banks, offer reduced volatility and increased security for investors due to enhanced government oversight, contributing to preventing inflation and stabilizing the economy.

CBDCs can reduce dependence on foreign currencies, enhancing long-term financial and economic stability for countries.

Additionally, CBDCs can enhance financial inclusion by providing access to financial services such as digital payments, loans, and savings for unbanked individuals.

7. Limitations of Central Bank Digital Currencies (CBDC)

The success of CBDCs poses an immediate threat to certain sectors of the banking industry, particularly those involved in savings, investment funds, credit services, or shadow banking^{xiv}.

In the scenario of widespread adoption of CBDCs by the public, commercial banks may face competition from central banks. Central banks could attract deposits from savers, diminishing the commissions and intermediation role of commercial banks, as virtual currency would be perceived by many as a risk-free asset guaranteed by the central bank.

Less robust and reliable private banks may experience a loss of public trust, leading to more volatile bank deposits or massive withdrawals with detrimental effects on their profitability, solvency, and liquidity.

Commercial banks might lose crucial customer information if clients turn to electronic wallets for transactions, impacting credit risk management, credit approval decisions, and monetary policy.

CBDCs also entail regulatory risks. The regulation of CBDCs can be complex and challenging to implement. Central banks will need to collaborate with governments, regulators, and businesses to develop regulatory rules and standards for the use of CBDCs.

8. Impact of CBDC on the Economy

The implementation of Central Bank Digital Currency (CBDC) can have a significant impact on a country's economy. Here are some potential impacts :

- ☞ Reduced transaction costs : CBDCs can decrease transaction costs for consumers and businesses by eliminating fees associated with credit and debit card payments, potentially stimulating consumption and economic activity.
- ☞ Improved financial inclusion : CBDCs can enhance financial inclusion by providing access to digital payments, loans, and savings for unbanked individuals.
- ☞ Fraud reduction : CBDCs can be more secure than cash and other electronic payment forms, reducing fraud and associated losses.
- ☞ Increased control of monetary policy : CBDCs can allow central banks to monitor and control the money supply more effectively, contributing to preventing inflation and stabilizing the economy.
- ☞ Reduced dependence on foreign currencies : CBDCs can help reduce a country's dependence on foreign currencies, enhancing long-term financial and economic stability.

9. Financial Inclusion

Definitions and indicators of financial inclusion have been established by international organizations responsible for financial inclusion, reflecting its multidimensional nature.

The Global Partnership for Financial Inclusion (GPFI) and the Consultative Group to Assist the Poor (CGAP) define financial inclusion as the situation in which all workers

have effective access to financial services such as finance, savings, and insurance provided by formal institutions (CGAP and BM, 2010, cited in Kuet and Cherkaoui., 2021, p.4).

The term "workers" refers to all working-age adults, and "effective access" implies convenient and responsible service delivery at an affordable cost for the client and sustainable for the provider, enabling financially excluded clients to use formal financial services rather than existing informal options (Kuet and Cherkaoui, 2021)..

According to the Organisation for Economic Co-operation and Development (OECD), financial inclusion is the process aimed at promoting affordable, timely, and adequate access to a wide range of regulated financial products and services and expanding their use by all segments of society through innovative and adapted approaches, including financial awareness and education to promote financial well-being and economic and social inclusion (García and al. 2013, cited in Kuet and Cherkaoui, 2021, p.4).

For the Bank of Algeria, financial inclusion is the availability and use of all financial services by different segments of society, including institutions and individuals, especially those marginalized, through official channels, namely current and savings accounts, insurance services, payment and transfer services, financing and credit services, and more suitable financial services innovations with competitive and reasonable prices^{xv}.

In summary, financial inclusion covers three main dimensions : access (availability), usage, and the quality of available financial services. It is of undeniable importance for governments, financial regulators, and especially central banks, as it directly impacts financial stability, which, in turn, affects economic growth. On a social level, financial inclusion focuses on low-income populations, giving special attention to women, accessibility for individuals, small, medium, and micro-enterprises, and their integration into the official financial sector through the provision of financial services available for marginalized categories, with a public interest in job creation to reduce

poverty and improve living standards^{xvi}. On an economic level, financial inclusion promotes competition among financial institutions, pushing them to continually improve the quality of their products, increasing the number of clients, and promoting formal channels.

10. Financial Inclusion Pillars

Financial inclusion measures must be implemented "responsibly" while establishing a robust framework for consumer protection and enhancing the financial capabilities of the population:

- a. Legal and Regulatory Framework : Regulation should include transparent and accessible mechanisms for recourse and dispute resolution, strengthened by market practice surveillance devices.

To consolidate financial inclusion, central banks formulate regulations to facilitate all forms of banking transactions, ensure access to financial services for users, legalize and supervise informal channels, promote the use of modern technologies in developing alternative channels to conventional financial services, enhance financial infrastructure through the establishment of credit information bureaus and the development of payment and settlement systems and financial intermediation, and finally, focus on financial education for citizens in the financial sector^{xvii}

- b. Availability of a Strong Financial Infrastructure and Financial Services. To meet the requirements of financial inclusion, the availability of a strong financial infrastructure involves prioritizing^{xviii}:

✂ Legislative environment, as explained above.

✂ Geographical distribution of the network of agencies of financial service providers, facilitated and complemented by the creation of small offices for service providers, especially for microfinance. It also involves encouraging the establishment of access points for financial services such as banking agents,

points of sale, ATMs, insurance, securities, etc., in accordance with state legislation.

- ✧ Development of national payment and settlement systems to facilitate the implementation of financial transactions between service providers in a timely manner.
- ✧ Expansion of digital financial services and payment through technological means to facilitate efficient access to financial services.
- ✧ Creation of comprehensive databases recording credit history for individuals and small and medium enterprises as well as movable property, made available to service providers and clients to ensure transparency and protection of rights.

c. Consumer Financial Protection

In the context of developing the financial sector and expanding electronic financial instruments, consumer financial protection is of great importance. This aims to increase trust in the banking and financial sector, thereby promoting financial inclusion and stability. It is necessary to offer clients fair and transparent treatment of quality financial products and services, easy to use and at a reasonable cost. This includes providing necessary and accurate information at all stages of the client's relationship with financial service providers, protecting clients' financial data, addressing their complaints promptly, and raising awareness among clients and marginalized categories, especially, and financial service providers about consumer financial protection principles^{xix}.

d. Financial Education

Financial education aims to inform and sensitize the population through targeted programs derived from an integrated financial education system. This enables consumers to fully benefit from financial services and products, better assess associated risks, and build a financially literate society^{xx}.

In this work, we focus on one of the key pillars in promoting financial inclusion: the emergence of innovative payment systems and means, specifically the implementation of a central bank digital currency (CBDC): the E-Dinar.

11. Exploratory Qualitative Study

The objective of this study is to explore the potential impact of introducing a central bank digital currency on financial inclusion in Algeria.

a. Research Methodology

To achieve this goal, a qualitative study based on semi-structured interviews will be conducted with ten (10) stakeholders in the financial sector in Algeria, including representatives from the central bank, commercial banks, and financial technology companies. Participants will be selected based on their experience and expertise in the financial sector in Algeria, and their ability to provide diverse and complementary perspectives on financial inclusion and digital currency.

Interviews will be conducted in person or online, depending on the participants' preference. Questions will focus on their understanding of financial inclusion and how a central bank digital currency could potentially influence individuals' and businesses' access to financial services. Questions will also address the benefits and challenges of introducing such a currency in Algeria.

The collected data will be analyzed qualitatively using a thematic analysis approach. Emerging themes will be identified and used to address the study's objective. It's important to note that this study will not allow for generalizing results to the entire Algerian population, but it will provide an in-depth understanding of perspectives and challenges related to the introduction of a central bank digital currency and its impact on financial inclusion in Algeria.

b. Results Analysis

The central bank's project to implement a Central Bank Digital Currency (CBDC) called E-Dinar is not unfamiliar to our respondents, as they have all been aware of this project through statements from officials and senior officials of the central bank or as part of the project to revise the law on currency and credit.

As of now, the E-Dinar has not been implemented in Algeria, making it challenging to predict its short-term or long-term impact on financial inclusion. However, based on our reflection on the potential impacts of implementing a CBDC on financial inclusion in general, and according to our respondents' answers, we have arrived at the following:

- Opportunities of the CBDC for the Algerian economy:
- According to our respondents, the CBDC could, in the short term, provide people without access to traditional banking services, such as bank accounts, credit cards, or loans, with easy and quick access to financial services via their mobile phones. This could particularly benefit individuals in rural or remote areas. Additionally, the CBDC could potentially reduce costs associated with financial transactions, including money transfer fees and costs related to the use of credit or debit cards. This could make financial services more affordable for low-income individuals.

The CBDC can also enhance the efficiency of fund transfers and social aid distribution by reducing costs and speeding up transactions. Furthermore, the introduction of this currency can decrease the use of cash, especially in e-commerce transactions, and also reduce hoarding. Finally, if the technological platform improves, the CBDC could enable the emergence of many ancillary activities related to the E-Dinar.

- In the long term, the implementation of a CBDC will boost the financial sector by providing more liquidity and improving the transmission channels of monetary policy. It can thus encourage financial inclusion by helping to enhance the transparency and security of financial transactions, potentially reducing the

risks of fraud and corruption and serving as a radical solution against tax evasion. This, in turn, could improve consumer confidence in the financial system and encourage more people to use it.

- Additionally, digital currency is an important element in the country's integration into potential multilateral cross-border payment systems. Finally, the CBDC could potentially stimulate the economy by facilitating commercial transactions and encouraging financial innovation. This could help businesses grow and create jobs, having a positive impact on financial inclusion in the long run.
- Current constraints for the implementation of E-Dinar:

To succeed in implementing the CBDC, a relevant strategy with an effective action plan and a comprehensive preparatory study, including a testing phase, is necessary. The implementation of a Central Bank Digital Currency (CBDC) in Algeria may face several obstacles:

- Archaic legislation: Legislation regarding financial technologies in Algeria is outdated and poorly adapted to recent technological developments. This can make the adoption of the CBDC difficult, as existing legislation may not be clear or flexible enough to allow for the use of this new financial technology.
- Insufficient technological infrastructure: Implementing a CBDC requires a strong technological infrastructure, including secure data storage and processing systems. In Algeria, technological infrastructure may be limited due to various factors such as low internet connectivity, a shortage of technical skills, and insufficient investment in information and communication technologies.
- High implementation costs: Implementing a CBDC can be costly, requiring significant investments in technological infrastructure, staff training, and the establishment of security mechanisms. This can be a significant obstacle for developing economies like Algeria.

- **Dominance of the informal market:** The adoption of a CBDC could be hindered by reluctance from informal market players to abandon their current mode of operation. They may see the CBDC as a threat to their business or consider the costs associated with using the CBDC too high. Moreover, the existence of an informal market can pose regulatory and control problems for financial authorities. Monitoring and regulating transactions outside the traditional banking system can be challenging, leading to illegal practices such as money laundering and terrorism financing.
- **Population's reluctance to trust the financial system:** Trust in the financial system is a key element for the success of any new initiative in this field. Trust in the financial system in Algeria may be low due to factors such as financial scandals, past economic crises, and corruption. This reluctance can affect the adoption of the CBDC in Algeria, as users may be hesitant to use new financial technology, especially if they are not convinced of its reliability and security. Concerns about privacy and surveillance could also be a concern for some.
- **High level of financial illiteracy:** In Algeria, many people have a limited understanding of financial products and the use of financial technologies. It is possible that citizens may encounter difficulties in using the CBDC, which could hinder its adoption.
- **Cybersecurity:** The security of the CBDC is a crucial aspect for protecting the money of Algerian citizens. The risks of cyber-attacks can be high, leading to significant financial losses for CBDC users.
- **Conflicts with the financial sector:** The implementation of a CBDC may conflict with the existing financial sector. Commercial banks may view the CBDC as a threat to their business and oppose its implementation.

According to the analysis of the obtained responses, it is difficult to identify the most important determinant for promoting financial inclusion in Algeria without a more

detailed analysis of the economic, social, and cultural situation of the country. However, some factors have been unanimously considered as important by our experts:

- ✓ Geographic accessibility: The ability of populations living in rural or remote areas to access financial services is essential to promote financial inclusion in Algeria. It is important to establish infrastructure to allow populations easy access to financial services.
- ✓ Trust in financial institutions: A large portion of the Algerian population is wary of financial institutions. It is essential to establish strict regulations to protect consumers and implement control mechanisms to strengthen trust in these institutions.
- ✓ Availability of suitable financial products: It is important to provide financial products tailored to the needs and financial capabilities of the population. This can include products such as basic banking services, microcredits, mobile money transfers, etc.
- ✓ Quality of financial and technological infrastructure, including payment and telecommunication networks, data processing services, digital security, and distribution platforms.
- ✓ Training and awareness programs that enhance the understanding of target populations of financial products and services, teaching them how to use them effectively.
- ✓ Government policies and regulations that facilitate access to financial services for target populations while protecting consumers and ensuring financial stability.

Therefore, it is understood that the implementation is indeed an important factor in promoting financial inclusion in Algeria, but it is crucial to focus, in parallel, on other equally important factors as mentioned above.

12. Conclusion

The implementation of a CBDC can contribute to financial inclusion by providing secure and cost-effective electronic payment options to people who do not have access to traditional banking services. This requires a robust digital infrastructure, public adherence, coordination with the financial sector, international cooperation, and an appropriate regulatory framework to ensure its success and adoption by the population.

However, the implementation may face obstacles such as insufficient technological infrastructure, high costs, financial illiteracy, digital security, and conflicts with the financial sector. It is important that these obstacles are considered, and appropriate solutions are found to ensure the successful implementation of the CBDC, such as reforming legislation regarding financial technologies in Algeria, working with financial sector stakeholders, and developing clear and flexible legislation that allows the use of the CBDC while ensuring the security and regulation of the financial system.

Financial authorities must actively work to strengthen public trust in the financial system and educate users about the benefits of the CBDC, while providing security guarantees and data protection.

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