

Relevance and Risks of Issuing a Central Bank Digital Currency in Colombia



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1. Introduction

The increasing digitalization of economies and technological advancements in financial markets have led central banks to review their role in the electronic payments ecosystem. Over the past two decades, significant innovations have emerged in the provision of payment services through Fintech, mobile payments, e-commerce, and cryptoassets¹ based on technologies like DLT (Distributed Ledger Technology)². These advances have introduced new financial, operational, and legal risks, as well as challenges related to affordability and potential market inefficiencies. In response, central banks have been updating regulations, promoting instant payment systems³ with successful examples like PIX in Brazil and UPI in India, and studying the structural and operational framework of central bank digital currencies (CBDCs) (BIS,2021).

A CBDC would be a liability to a Central Bank. It would be a new form of legal tender complementary to cash (banknotes and coins) and to the reserves of financial institutions in the central bank's deposit accounts.

International evidence suggests that a CBDC has the potential to benefit the payments ecosystem. However, the risks associated with its issuance, the identification of the use cases where its provision is essential, and the robustness and economic feasibility of its technological and operational implementation remain subjects of ongoing research (Annex 3).

This document presents the analysis that *Banco de la República* (the Central Bank of Colombia) has carried out on CBDCs, organized as follows: the second section describes what a CBDC is. The third and fourth sections analyze the possible benefits and risks of issuing a CBDC and its relevance in Colombia under the current conditions. The last section presents the conclusions.

¹ A cryptoasset is a digital representation of value or contractual rights that is cryptographically secured and can be transferred, stored, or traded electronically through programmable networks such as DLT. Among these are Bitcoin, Ether, Ripple, and Litecoin which are not backed by any asset and their market value is highly volatile, and stablecoins, such as Tether, Dai, or Binance, backed by assets such as national currencies or other assets, and which seek stability in their market value (BIS, 2013; Arango et al 2018).

² DLT (Distributed Ledger Technology) is a data storage technology that is shared and duplicated across various nodes or computers which can be found in different jurisdictions. When performing some type of operation, it will be executed on all nodes, to update the distributed information. Digital representations of value or cryptoassets can be issued, held, and transferred on DLT platforms.

³ Instant payment systems are characterized by allowing the funds from a transfer to be available to the recipient quickly (usually within seconds). These systems facilitate interoperability between participants and operate continuously 24/7, with very low costs for money transfers. They are available to households, companies, and government in various use cases through deposits at financial institutions, which differentiates them from CBDCs.

2. What does Central Bank Digital Currency stand for?

In Colombia, as in most economies, money primarily consists of (i) primary money issued by the Central Bank in the form of cash (banknotes and coins in circulation) and deposits of financial institutions in central bank accounts; and (ii) demand deposits by companies, households, and the government in financial institutions (bank money)⁴. Except for cash, all these forms of money are currently digital, transferable between agents electronically⁵.

For the purposes of this document, a CBDC would constitute a new form of legal tender and would be classified as a liability to the Central Bank along with the cash and reserves of financial institutions in deposit accounts with the Central Bank (monetary base). This option would require amending Law 31 of 1992. On the one hand, retail CBDC would allow central bank money to be accessible in digital form by the public. On the other, wholesale CBDC would give access to central bank money to eligible institutions in the financial system that require digital representations of central bank money as an alternative to the traditional accounts currently available, such as a tokenized CBDC (Annex 1).

The CBDC is considered a means of payment (legal tender issued by the Central Bank) with its own access, corporate governance, and operational rules. These aspects correspond to decisions in the design of a CBDC that must consider the impact that it may have on the monetary and financial system and on the operation and reputation of the Central Bank to preserve confidence in the currency. This includes the roles of the Central Bank and the private sector; issuance and distribution technology; interoperability and scalability; incentives and promotion; privacy aspects; and the mitigation of financial, operational, and legal risks (Annex 2).

3. What are the potential benefits and risks of a CBDC?

3.1. Potential benefits

Central banks have considered several motivations for exploring the possible issuance of a CBDC. These can be grouped into three categories: i) promoting access to electronic payments and financial inclusion; ii) facilitating the competition, efficiency, and resilience of the payment

⁴ Almost without exception, central bank money (the monetary base) is the safest means of payment in the economy because it does not present the credit and liquidity risks faced by other forms of money. However, bank money in Colombia has an institutional arrangement that ensures levels of security and liquidity similar to those of money issued by the central bank. Balances in deposit accounts are insured by the state up to certain amounts, and the institutions that issue these accounts are subject to rigorous supervision regimes and are supported by the central bank as the monetary authority and lender of last resort.

⁵ However, checks are still used to make transfers of funds in certain contexts, but their use is low. Currently, the value of checks drawn in a year amounts to about COP 300 trillion, only 0.28% of electronic transfers between bank accounts.

system; and iii) maintaining access to central bank money in the digital age to safeguard the monetary and financial system (Kosse & Mattei, 2023; Araujo, 2022).

A CBDC could improve financial inclusion in countries with limited financial systems, offering a safe and accessible alternative for making payments and transfers. This could reduce the costs and risks associated with cash and increase the traceability of transactions, promoting access to financial services such as credit. It could also protect the public's ability to make payments by overcoming challenges such as reduced cash acceptance, and, with an appropriate design, enable segments excluded from the digital economy⁶.

A CBDC could be complementary to other electronic payment instruments, improving the resilience of the payment system. Since payment systems benefit from economies of scale and network effects⁷, a CBDC could prevent market concentration, promote competition, reduce fees, and mitigate the social impact of service disruptions. Particularly, in emerging markets, it could also reduce the costs associated with cash. In addition, designed as an open platform, a CBDC could stimulate innovation and competition, and facilitate the standardization and interoperability of domestic and cross-border payments.

A CBDC could ensure that central banks strengthen their roles by harnessing emerging technologies. With the decline in cash usage, CBDCs could ensure the public provision of money and payments in the digital economy, becoming a confidence anchor in the monetary system. They would serve as a reference and backing for other types of money, guaranteeing monetary and financial stability. CBDCs could also maintain the importance of domestic currencies against foreign cryptoassets and other CBDCs, ensuring the effectiveness of monetary policy and limiting currency substitution. However, credibility in the national currency's value is crucial to prevent its substitution.

3.2 Potential risks

3.2.1 Retail CBDC

The literature suggests that the risks of a retail CBDC **on the monetary and financial system** can be mitigated through appropriate design. Poor design can lead to financial disintermediation, reduce credit provision, higher interest rates, more unstable or expensive sources of funding, and increased concentration and risk-taking. It may also undermine the effectiveness of monetary policy by shifting loanable funds to the CBDC, requiring a more active lender-of-last-resort policy

⁶ In offline digital payments, money can be transferred without needing to validate the availability of funds online, and, in some applications, the identity of the parties to the transaction. This functionality has been identified as an essential aspect of the design of a retail CBDC that seeks wide availability even in contexts where telecommunications are of limited access (see Annex 2).

⁷ Economies of scale are the lower unit costs of production that occur as the quantity produced increases. Network effects arise from the fact that the benefits of being part of a network increase with the number of users. These two characteristics are typical of the payment services industry.

in stressful situations, as it may increase the risk of bank runs.⁸ Conversely, a well-designed CBDC can be neutral or beneficial for financial stability, monetary policy, and welfare (Martínez-Ventura et al, 2023; Richards, 2020; MAS, 2021; BRI, 2022).

One of the most studied risks is that of **possible financial disintermediation** due to the substitution between bank deposits and the CBDC. This risk depends on whether the public's CBDC holdings earn interest. If a non-interest-bearing CBDC is introduced or if it offers lower interest rates than deposits or bank accounts, there would be no pressure towards financial disintermediation. Conversely, if the CBDC's interest rate is high, the degree of disintermediation will depend on the degree of bank competition. With sufficient market power, banks can adjust their interest rates upwards and avoid the transfer of deposits to the CBDC.

Associated with the **financial risks** is the uncertainty about the degree of retail CBDC adoption. High adoption can jeopardize financial stability and affect monetary policy transmission channels, while low adoption could prevent the achievement of set policy objectives (Das et al., 2023). Some jurisdictions, like the European Union and Canada, focus on providing a CBDC with similar properties to cash. Others, like Brazil, aim for innovations that promote greater financial inclusion.

Central banks would have several **mechanisms to mitigate the financial risks** of introducing a retail CBDC. These would include implementing non-interest-bearing CBDC, setting limits on holdings or usage, and impose fees for high holdings to limit its demand as store of value (Cipollone, 2023). Central banks in Europe, Canada, and Chile, and the few countries that have issued CBDCs like the Bahamas, Jamaica, and Nigeria),⁹ have expressed a preference for non-interest-bearing CBDCs. Another option for the central bank is to increase the liquidity for commercial banks to offset potential reductions in bank deposits, though this could lead to unwanted behaviors, and complicate central bank functions.

The issuance of a retail CBDC would represent significant commitment by the central bank to the public regarding its provisioning and integrity. **Implementation risks** regarding service interruption, cybersecurity, fraud, information protection, outsourcing in issuance or distribution, competition, and reputational risks are of special consideration for central banks. On the other hand, evidence on the robustness and economic feasibility of different architectures for the development of retail CBDC in practice is still limited.

Financial regulation and the central bank's functions and powers may not be robust enough to mitigate the **legal risks associated with the issuance of the CBDC**. Issuing a CBDC (wholesale or retail) requires a careful legal analysis of the powers and responsibilities of each actor in the

⁸ As some authors have argued, the greatest risk of bank runs would be contained by public deposit insurance schemes.

⁹ Atlantic Council, available at: <https://www.atlanticcouncil.org/cbdctracker/>

ecosystem. Key aspects to consider include the legal basis for issuing new forms of central bank money, the rights and obligations related to user and participant information privacy, access rules to the central bank's infrastructure and other value chain links, obligations regarding financial fraud, and the protection of end-users and their resources, as well as competition law considerations.

3.2.2 Wholesale CBDC

The implementation of wholesale CBDC entails risks comparable to those faced by central banks when managing traditional high-value payment systems. These include the need for a robust financial, technological, and operational architecture. Risks are associated with the financial, operational, and legal soundness of the participants, the systemic instability (of several participants) that may arise from operational failures or financial fragility of the participants, the operability of monetary policy, and the corporate governance structure.

The implementation of a wholesale CBDC may require **changes in the technological and operational architecture** as well as rules governing the provision of wholesale financial infrastructures. New business models and financial infrastructures might need restructuring of the central bank's service offerings and could grant new participants access to central bank money and monetary policy mechanisms. Some aspects of wholesale CBDC design may involve third parties in its provision and governance. Additionally, systemic risk can be exacerbated or mitigated depending on the financial innovation and functionalities that can be implemented in a wholesale CBDC.

4. Relevance of the issuance of a CBDC in Colombia

4.1 Retail CBDC in Colombia

***Banco de la República's* analysis indicates that for now there are currently no reasons to justify issuing a retail CBDC in Colombia.** The potential benefits of this can be achieved with alternative policies. Particularly, Colombia has updated regulations to promote competition and enhance transparency in the payment services market (Decreets 1692 of 2020 and 1297 of 2022). Additionally, *Banco de la República* has taken on the responsibility of promoting interoperability in instant electronic payments through regulation and the development of centralized infrastructures (Article 104 of Law 2294 of 2023).

Instant electronic payments have the potential to reduce reliance on cash and reach broad sectors of the population at low cost. In the future, as is already happening in some regions of the world, it will be feasible to interconnect national instant payment infrastructures with those of other jurisdictions, thereby improving cross-border payments¹⁰.

¹⁰ See Annex 3 on international instant payments.

Implementing a retail CBDC would imply that the Central Bank and the Colombian Government develop a strategy similar to the one currently being applied to instant payments. This strategy would need the support of the private sector, ensure interoperability with existing payment systems, guarantee convertibility between the CBDC and bank money, and comply with operational and service delivery standards. In addition, it would face challenges related to competition, technological accessibility and communications similar to those of the instant payment scheme. In fact, in the future, the CBDC could circulate through the infrastructure that supports instant payments if its issuance is deemed relevant.

The introduction of a retail CBDC in Colombia could have significant implications for the financial system and *Banco de la República's* functions. It would place a substantial responsibility on the Bank to design a CBDC that meets policy objectives without adversely affecting the monetary and financial systems. This could impact and require significant capital and human resources, potentially competing with other strategic projects. Additionally, it might require changes in how the financial system and the state provide infrastructure and guide monetary policy.

The issuance of a retail CBDC is unlikely to address the risks posed by cryptoassets, such as foreign or private digital currencies, in terms of financial stability and monetary sovereignty. To address recent innovation in the cryptoasset sector, central banks, in collaboration with other authorities, have been studying the introduction of regulations and assessing how to accommodate this sector's needs and contain potential risks (FSB-IMF, 2024; Adrian, 2024).

Banco de la República would consider issuing a retail CBDC only if the benefits to the economy outweigh the implementation costs, including adverse risks. Additionally, its issuance must be superior to other strategies in addressing the challenges of the payment ecosystem.

4.2 Wholesale CBDC in Colombia

The relevance of a wholesale CBDC will depend on the innovation of business models for providing financial and payment services that require non-traditional forms of central money. Currently, financial platforms leveraging technologies such as Distributed Ledger Technology (DLT) offer digital payments, credit and issuance, custody, negotiation, and transfer of digital assets, among other services¹¹, using cryptoassets or stablecoins. Depending on the size and importance of these platforms, there may come a time when it is advisable for the central bank to make use of a wholesale CBDC. A wholesale CBDC is a superior asset to cryptocurrencies in terms of risk management and its contribution to payment efficiency (Barth et al., 2023). This would be consistent with the Principles for Financial Market Infrastructure (BIS-CPSS, 2012).

¹¹ Many of these developments have been coined under the term “decentralized finance” (or DeFi) (See Aramonte et al., 2021).

The BIS, several central banks, and private institutions are studying unified platforms where wholesale CBDC coexists with stablecoins and other digital assets in a tokenized manner (Annex 1). These developments seek greater process automation, reduce the number of intermediaries and operational mistakes, and enhance transparency and resilience. One of the most promising use cases in such experimentation is cross-border payments based on platforms where CBDCs from multiple countries coexist (BIS-CPMI, 2022; BIS-CPMI, 2023).

International advances have yielded mixed results regarding the advantages of a wholesale CBDC compared to other alternatives to provide access to central bank money¹². Switzerland is currently studying the benefits of adjusting the functionalities of its high-value system SIC – Swiss Interbank Clearing, compared to the issuance of the wholesale CBDC. Similarly, the central banks of England and Germany, as well as the European Central Bank are exploring alternatives that do not require the issuance of a CBDC¹³. Likewise, solutions like RTGS. Global aim to integrate traditional wholesale payment systems to address cross-border payment issues.

In Colombia, the development of wholesale financial business models based on new technologies such as DLT is still incipient in some niche markets. Together with other financial institutions, the stock exchange has hired DLT solution providers to experiment with automating derivatives market processes¹⁴. Other DLT projects include the issuance of a digital bond with the alliance of the IDB and *Davivienda*, and the *Davivienda*'s project for issuing bank guarantees. Moreover, 59% of startups affiliated with Colombia Fintech claim to have adopted DLT (Colombia Fintech, 2022). However, the demand for a wholesale CBDC to support such developments has yet to materialize.

Although there are currently no specific use cases in Colombia that justify the issuance of a wholesale CBDC, *Banco de la República* is advancing in an experimentation agenda that aligns with international trends in this area¹⁵. It should be noted that *Banco de la República*'s infrastructures supporting the electronic settlement of obligations in the wholesale financial market are efficient, automated, and secure.

¹² See Durfee, Leigh-Maniff, and Slattery (2023) and WEF (2024) for a discussion of the relevance of a wholesale CBDC.

¹³ More information at: <https://www.bankofengland.co.uk/-/media/boe/files/paper/2023/the-digital-pound-consultation-working-paper.pdf>, <https://www.ecb.europa.eu/press/key/date/2022/html/ecb.sp220926~5f9b85685a.en.html> and <https://www.ledgerinsights.com/bundesbank-why-it-prefers-trigger-payments-to-token-based-wholesale-cbdc/>

¹⁴ More information at: <https://www.ledgerinsights.com/colombian-stock-market-blockchain-otc-derivatives-margins/>

¹⁵ Since 2018, *Banco de la República* has been experimenting with DLT technologies. It is currently conducting proofs of concept with a wholesale CBDC and digitized public securities. Additionally, it is participating in the study of solutions for cross-border payments based on multiple CBDCs.

5. Conclusion

Private advances and public actions are well aligned to address the main challenges facing the retail payments ecosystem. The challenges are not related to the nature of the digital payment method (CBDC versus bank money), but to frictions in service provision. Issuing a retail CBDC represents significant operational and reputational risks without clear use cases that guarantee its contribution to welfare or demonstrate its efficiency over *Banco de la República's* current strategy to strengthen instant payments.

On the other hand, a wholesale CBDC could be superior to cryptocurrencies as a settlement asset in a new financial infrastructure where, for example, the payment method is required to be tokenized (e.g., on DLT platforms) and settlements are recommended to be made in central bank money. Additionally, a wholesale CBDC could help resolve frictions in cross-border payments. Multi-CBDC platforms could reduce intermediation, automate processes, enhance transparency, and reduce risks in the settlement of obligations. However, there are currently no use cases or functionalities that require the implementation of wholesale CBDC developments in the short term.

This allows us to conclude that there are currently no compelling reasons to issue a CBDC, whether retail or wholesale, in Colombia. Moreover, any potential issuance of a CBDC would require a careful study of the regulatory requirements, along with the necessary legal adjustments to enable it to be legal tender.

***Banco de la República* will continue to study developments regarding CBDCs and their potential for the economy.** It will assess the trends that may warrant its issuance, such as reduced cash acceptance, national or international financial and digital innovations, or market failures in the provision of electronic payment services. The Bank will also continue to develop its experimentation agenda with new technologies such as DLT, assessing the potential benefits and risks of issuing a CBDC in controlled environments. In addition, it will continue to participate in initiatives by multilateral entities such as the BIS, the World Bank, and the Inter-American Development Bank in this area.

Annex 1: Asset tokenization, stable currencies, and unified BIS platform

Recent technological advances have created alternatives that can bring benefits to the monetary and financial systems, including asset tokenization. Asset tokenization refers to representing an asset's value and property rights as a digital token on a programmable platform such as those based on DLT.

Programmable platforms allow for process automation, reducing the need for intermediaries and the separation of processes such as messaging, reconciliation, and payment settlement¹⁶. Additionally, programmable assets have features such as asset fractionation and composability¹⁷, which enhance accessibility and liquidity and enable the construction of more complex portfolios or assets.

Bank deposits and stablecoins are among the assets with the greatest potential for tokenization. Stablecoins are private digital currencies that promise to maintain their value over time by being backed by assets, such as currency reserves, including the US dollar, or other backing assets.

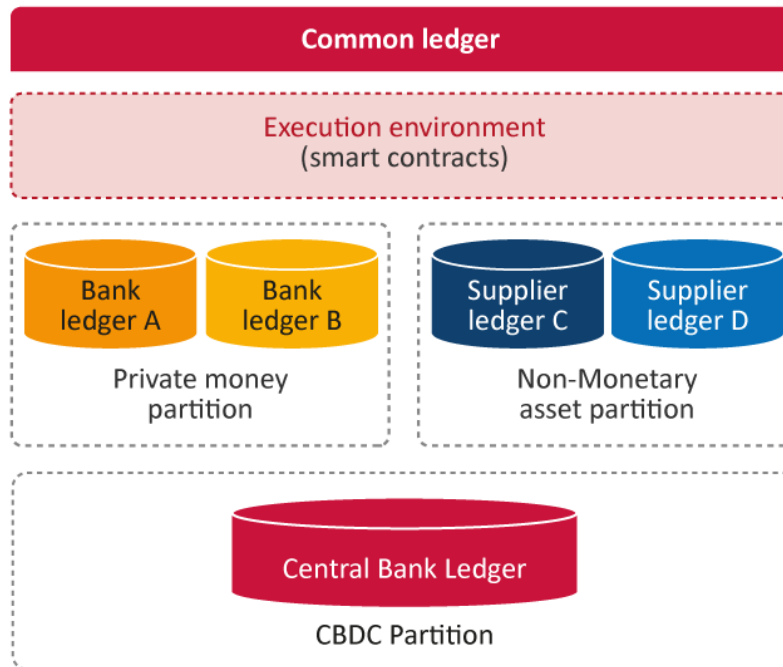
The BIS has emphasized that the success of tokenization relies on having a solid means of payment for transactions. It recognizes that central bank money, due to its security and liquidity, would provide a strong foundation for the development of tokenization and the uniqueness of money¹⁸. In this context, a CBDC is more resilient than private digital currencies like stablecoins, which have shown deficiencies such as lack of a value anchor, risk of runs, limited interoperability, and failures in custody and exchange platforms (BIS, 2022 and 2023).

In line with this, the BIS has presented a proposal for a new financial market infrastructure: a common platform in which private (tokenized) and public (wholesale CBDC) assets coexist to improve the monetary and financial system.

¹⁶ In DLT environments, programmability is achieved through smart contracts (contractual rules developed in code) and other computational protocols.

¹⁷ Composability is a design feature that allows systems to disassemble their parts and reassemble them according to user needs. In other words, it is the ability of smart contracts to combine different components in a system.

¹⁸ The uniqueness of money is a property that allows payments in the national unit of account to be settled at par with their value, even though users use different forms of privately and publicly issued money (e.g., bank deposits or coins and banknotes) (BIS 2023).

Graph A1.1. Common Ledger¹⁹

Note: Complete unification example. The BIS is explicit in mentioning that multiple interconnected infrastructures can operate in an economy through programmable interfaces or APIs²⁰. This detail is not included here.

This platform allows CBDC, private money, and other tokenized assets to coexist. The wholesale CBDC can be provided as a central bank liability issued directly in the general ledger, or the reserves in central bank accounts can be tokenized using an API (application programming interface)²¹ that connects them to the unified ledger, ensuring finality and atomic settlement²² for CBDC transactions, private money, and tokenized assets (Graph A1.1).

The creation of a unified platform does not constitute a single general ledger but rather the integration of different asset digitization and payment systems in the economy. Particularly, with the use of APIs, the new programmable platform can be connected to various existing systems, offering an intermediate solution. This could allow some operations to be automated, resulting in lower costs and less need for coordination between system participants than the creation of a unified ledger.

¹⁹ The general ledger refers to the digital scheme that maintains the record of accounts and transactions of participants in the asset digitization platform.

²⁰ APIs are programming codes that act as intermediaries between two or more systems and enable communication between them.

²¹ See footnote 20.

²² Atomic settlement enables the simultaneous and irreversible transfer of assets or money between agents in a transaction, eliminating the risk of incomplete or partial transactions.

The BIS proposal is in line with similar proposals by the Central Bank of Brazil and the US Federal Reserve, as well as some private initiatives²³ (for more details on the BIS proposal, see BIS, 2023).

²³ See, for example, the initiative by several financial institutions at <https://regulatedliabilitynetwork.org/>

Annex 2: Architecture and design of a retail CBDC

The design of a retail CBDC depends on its architecture, which defines its provision and related payment services. Recent literature (Auer, Cornelli, and Frost, 2020; Auer and Böhme, 2021) has highlighted several architectural options²⁴:

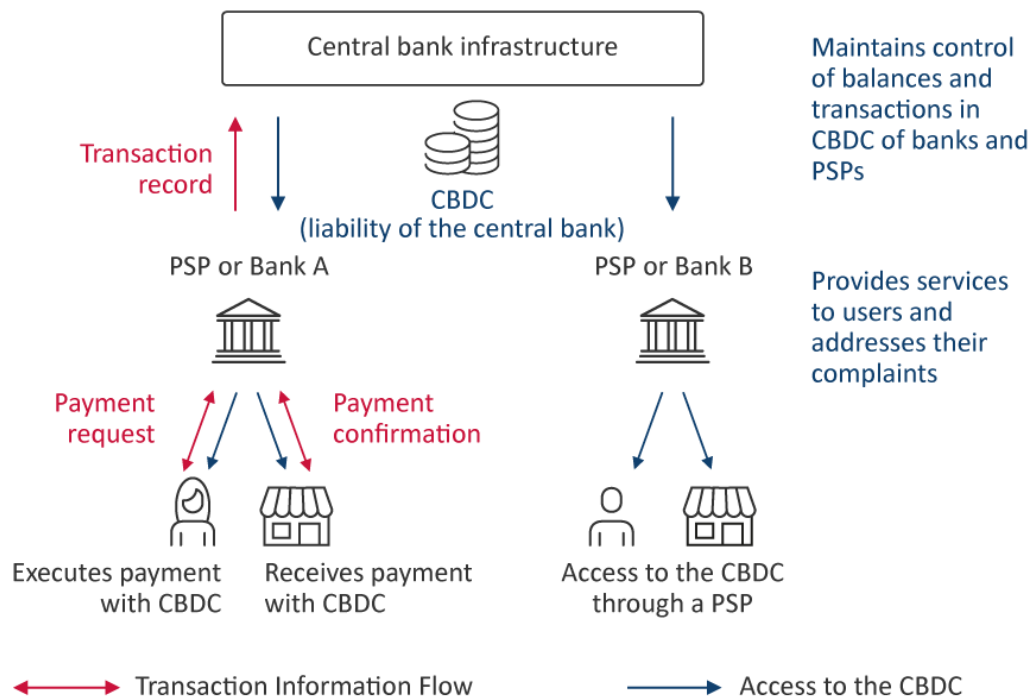
Direct: The central bank performs all functions, from the issuance of the currency and its distribution to its transfer for redemption into other forms of central bank money, such as cash.

Hybrid: This is an intermediate two-level solution. Financial intermediaries handle retail payments, but the central bank maintains the record of all transactions and a technical backup infrastructure that allows the payment system to restart in case of intermediary failures.

Intermediated: This architecture is similar to the hybrid one, but the central bank maintains the record of wholesale payments instead of a central record of all retail transactions, with financial intermediaries executing the payments (Graph A2.1).

The hybrid and intermediated architectures are preferred by most economies interested in a retail CBDC and require close collaboration between the central bank and private payment service providers (PSPs) (Kosse and Mattei, 2023).

Graph A2.1 Intermediated Architecture of a CBDC



²⁴ Indirect or hybrid architectures are also recognized in which digital currency would be a liability of intermediary financial institutions, which must fully back it with their reserves in central banks while the public accesses the money from commercial banks.

As shown in the graph, in an intermediated architecture, the Central Bank issues the CBDC and manages an infrastructure where balances and transactions with banks and payment service providers (PSPs) are recorded. These intermediaries provide the public with access to the CBDC and interfaces for making payments and transfers, in addition to processing these payments. Given their importance in the system, intermediary entities are expected to be supervised and/or regulated or receive authorization from the Central Bank.

Other aspects of the design of a retail digital currency may have relevant implications for the central bank's objectives, public attractiveness, and adoption (IMF, 2023). These include potential remuneration or interest payments on its holdings, the user's access model, the technological infrastructure, as well as functionalities such as offline use and cross-border payment interconnections.

A non-interest-bearing retail CBDC would resemble cash, while an interest-bearing one would be similar to savings instruments or bank deposits, competing with commercial banks. However, interest remuneration would make the digital currency a better reserve asset than cash.

Regarding user access to the currency, account-based models or tokenized currency models can be implemented. The latter would allow for more universal access (such as cash). The choice between these models depends on priorities regarding privacy and transparency. The tokenized model could offer greater anonymity in transactions, while the account-based model requires user identification. Alternatively, anonymity could be offered for low-value transactions, with transparency or information recording required for high-value transactions exceeding a defined limit. This data could potentially aid financial inclusion and address financial fraud risks.

Central banks are also considering the option of imposing limits on retail CBDC holdings or transaction values to discourage their use as a store-of-value asset. This could moderate the demand for CBDCs and mitigate the risks of financial disintermediation and possible bank runs.

Additionally, the implementation of offline functionalities for the digital currency is being studied. This could facilitate access in countries with connectivity issues due to limited infrastructure, geographical barriers, or a lack of smartphones among the population. Such functionality would increase access to digital payments and enhance financial inclusion in these countries.

Finally, decisions must also be made on the technological infrastructure for operating the payment system and recording transactions and data. Central banks are considering both traditional and innovative technologies, such as DLT, for implementing a retail CBDC. The choice depends on the type of operational architecture and design decisions (Auer and Böhme, 2020).

In the case of the DLT, the general ledger is jointly managed by different institutions in a decentralized manner. A central element of DLT architectures is governance over access and

roles in processing and validation of transactions by various actors within the system. General ledger updates must be harmonized among the institutions' nodes through consensus mechanisms.

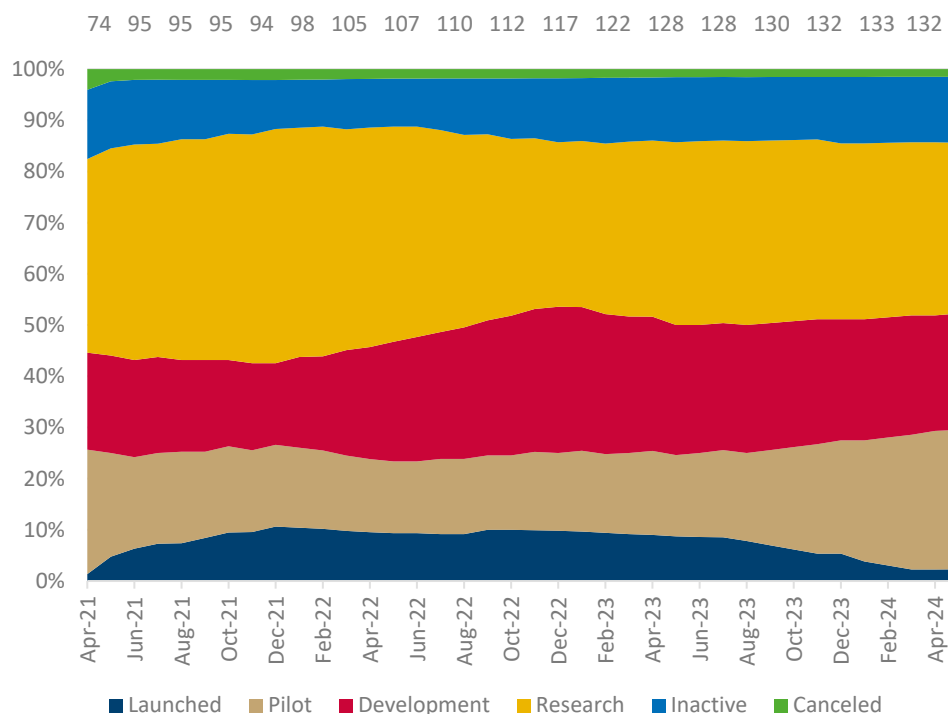
Annex 3. The international context of CBDC and cryptoassets

Central banks have various motivations for considering the potential issuance of a CBDC. These motivations can be grouped into three categories: promoting access to payments and financial inclusion; facilitating competition, efficiency, and resilience within the payment system; and maintaining access to central bank money in the digital age to safeguard the monetary and financial system (Kosse, A., I. Mattei. 2023; Araujo 2022).

A significant number of countries (132), representing 98% of global GDP, are assessing the possibility of having CBDCs, with progress in pilot and development stages; however, few have issued them. Information compiled by the Atlantic Council (2024) highlights that, out of 132 countries, 67 are actively analyzing retail CBDC, with 52 in more advanced stages of development (31 pilots and 21 in proof of concept), while only three have already launched one (Nigeria, Bahamas, and Jamaica). Meanwhile, 40 countries are analyzing wholesale CBDC, 36 of which are in advanced stages of experimentation (19 with pilots and 17 in proof of concept) (Graph A3.1).

Graph A3.1 Evolution in stages of work in CBDC

(Percentage and number of countries)



Source: Authors' elaboration with information from Atlantic Council (2024).

Note: On the upper axis is the total number of countries working on CBDC for each date.

The most significant advances in retail CBDC have occurred in developed economies with greater innovative capacity, adoption of digital payments, and financial deepening, as well as in

developing economies with less financial inclusion, higher commercial and financial closure, and greater informality. In the case of wholesale CBDC, greater interest and progress have been observed in countries with developed financial markets, higher digitization of the economy (e-commerce), robust legal systems, and greater economic openness (Maryaningsih et al., 2022).

The BIS, through the Innovation Hub (BISIH), has been one of the leaders in the CBDC experimentation agenda in alliance with several central banks (BISIH, 2023). Experimentation with wholesale CBDCs has shown potential in cross-border payments and digital asset DLT platforms; however, their efficiency compared to other alternatives remains unclear²⁵.

Countries with pilots or retail CBDCs have faced low adoption by the public²⁶. Their implementation has experienced technical challenges, causing interruptions and delays in key services such as offline payments. In addition, although the technology can accommodate various design needs, there is no single solution that meets all requirements, highlighting scalability issues and operational risks.

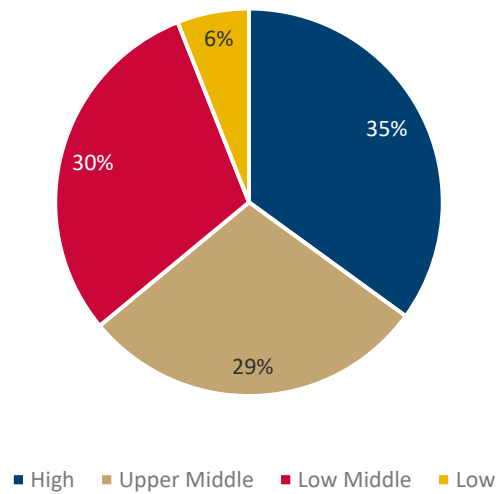
Among the motivations for studying CBDCs are the challenges posed by the world of cryptoassets, particularly stablecoins²⁷, for the monetary and financial system. The use of cryptoassets has permeated both emerging and developed economies (Graph A3.2). In Latin America, adoption is growing at 40%, with Colombia ranking 32nd among the countries with the highest adoption worldwide, while Brazil is 9th, Argentina 15th, and Mexico 16th (Chainalysis, 2023). In turn, some private banks have publicly announced their strategy of relying on DLT technology for the automation of issuance processes, custody, and trading of cryptoassets²⁸. These developments can present opportunities with new business models, but also pose financial risks and abuses against financial consumers.

²⁵ See Durfee, Leigh-Maniff, and Slattery (2023) for a discussion on the relevance of a wholesale CBDC.

²⁶ Noll (2024).

²⁷ Some of these stablecoins are tied to national currencies.

²⁸ For example, in Brazil, some private banks (Itaú, BTG Pactual, and Santander) are preparing their asset digitization strategy in anticipation of the launch of a CBDC, and other financial institutions have been promoting Retail Liquidity Networks (RLNs) for the tokenization of public and private assets in a regulated CBDC environment and other forms of digital money (e.g., Citibank, Swift, HSBC, Wells Fargo, and Lloyds Bank).

Graph A3.2 Use of Cryptoassets by Country Income Level

Source: Authors' elaboration with information from Chainanalysis (2023).

It should be noted that the objectives of a CBDC regarding financial inclusion, efficiency in the provision of payment services, and monetary and financial resilience can be achieved with alternative strategies to a CBDC. Many emerging economies have achieved high levels of access to transactional accounts with public-private initiatives, which have provided broad access to digital payments. Examples include the development of mobile payments networks and QR transfers. Additionally, regulations in various countries have made progress in reducing barriers to entry and moderating fees associated with electronic payments (Arango-Arango and Ramirez-Pineda, 2022).

Central banks have promoted instant payment systems as operators and/or catalysts, in collaboration with the private sector to achieve interoperability and a unified user experience in retail payments. These systems can include various use cases and functionalities similar to those expected from CBDC-based systems, such as payment programmability and offline payments (Arango-Arango et al., 2022; Frost et al., 2024). Furthermore, initiatives are underway to integrate traditional retail and wholesale payment systems to reduce costs and enhance the speed of cross-border transactions.

Finally, to address recent innovation in the cryptoassets world, central banks have been studying, with other authorities, the introduction of regulations for this sector. They are assessing how to accommodate the needs of eligible innovative platforms such as those based on DLT by adjusting their infrastructures and access policies.

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