

Policy considerations on central bank digital currencies for emerging market economies – Mexico

1. Digital innovation and the payment ecosystem

Technological advances and innovation are changing payment and financial services, causing a structural transformation in the ecosystem. Retail payments have been and continue to be one of the activities most influenced by this process. Innovation has focused on increasing convenience by improving the front end and introducing new ways to initiate payments and improve customer interfaces.¹ In this context, technology evolution and its adoption for retail payment solutions can contribute to improve financial inclusion and become the cornerstone of improved forms of digital money.

Nowadays, mobile devices with high processing capabilities are widely available to the population and continuous connectivity to the Internet has improved consistently. This generates multiple access channels for the development of more and better financial services, which are provided in a secure and efficient manner; in addition to creating possibilities for collecting information that in the past was difficult or even impossible to gather. Therefore, the current technological evolution that allows a constant improvement of the services offered in the market, results in new products and services with enhanced capabilities.

Safety and efficiency are imperative for new payment solutions and in this context, financial authorities – in particular, central banks – play a critical role in promoting state-of-the-art financial infrastructures in their roles of regulators and supervisors, and, in some cases, as operators of payment infrastructures. Consequently, central banks play an integral role in the provision of means of payment, whether digital or physical. Thus, leveraging the latest technology and developing fast retail payments and central bank digital currencies (CBDCs) are of the utmost importance.

The trust currently placed in the monetary and financial architectures and their institutions is an invaluable asset for society. Central banks should not look at this technological change as a need to redefine the public functions they serve: the provision of money and financial market infrastructure. Instead, central banks' challenge is to find how recent advances in technology and innovation can amplify the payment and financial services provided under the current monetary and financial architectures and to improve their resilience and quality for the benefit of users.

Concrete short-term steps and deliverables should focus on extending currency functions towards fully operable CBDCs, with a solution compatible with banks' intermediation role and delivering more efficient payment services, while keeping the current financial and monetary architectures that have supported financial intermediation and monetary policy implementation. This perspective would put

¹ See Bank for International Settlements, Monetary and Economic Department, March 2020, BIS Quarterly Review, International banking and financial market developments. Available at https://www.bis.org/publ/qrtrpdf/r_qt2003.pdf

central bankers' role in providing money at the centre of the development of digital innovation for payment systems.

This process involves the development of an open finance ecosystem, and authorities should be careful to avoid market failures associated with concentration, vertical integration and lack of interoperability. Also, the inclusion of new network-based participants – so-called fintechs and big techs – in the financial ecosystems of emerging market economies (EMEs) raises key issues for public policy in terms of competition, consumer protection and financial stability.

An open finance ecosystem without adequate regulation and incentives will not deliver the desired public goods. In this context, payment networks of big techs and fintechs cannot be left to evolve outside our financial ecosystem. We must work on the necessary regulatory and technological conditions to ensure these are part of our financial systems. Under this approach, gains in efficiency would translate into improved financial services and inclusion with a firm footing.

We should be careful and avoid any potential sub-optimal result when developing a strategy to adopt innovative technologies. Materializing the objectives will require global coordination, sustained political support and investment in systems, processes and technologies. Success will also require a commitment to work together with the private sector in order to ensure the implementation of any services designed for the general population.

2. Payments vision and the public policy principles to promote innovation

Having a clear vision regarding the financial and payment ecosystem we aim for in our society guides the authorities' steps in this process. In order to ensure the proper functioning of payment systems, as mandated in its law, Banco de México has developed a long-term vision of payments, whose guideline is that all Mexicans should have the possibility of sending and receiving secure, immediate, low cost, efficient and available at any time electronic payments. The goal is that any citizen can make their payments in a transparent and secure way, at any time, from any place and under different modalities.

Banco de México 's vision also requires to move fast on this effort, with the right strategies and approaches to develop the best digital payment ecosystems and a more inclusive and efficient financial system, and make good use of the opportunities offered by new technologies. We have identified seven public policy anchors essential to this process:

- i. **Same risk/same regulation.** This policy approach aims to promote regulation according to the services and risks that a financial actor represents for the system, regardless of the actor's type of authorisation, concession, or figure. It focuses on aligning incentives to achieve maximum social benefits, addressing market failures, and promoting an environment for competition. It should be based on a level playing field to mitigate risks associated with the payment service provided, such as anti-money laundering/combating the financing of terrorism (AML/CFT) requirements, legal, financial and operational risks.

- ii. **Interoperability and network neutrality.** Incentives are set for developing private networks against the public interest of expanding and exploiting network externalities and economies of scale. Large existing networks may want to use their condition as a competitive advantage to carry out financial transactions exclusively through their networks. To avoid this condition, promoting interoperability and neutrality becomes a crucial objective.
- iii. **Fostering competition to avoid kingmakers.** The inclusion of new network-based participants– ie fintechs and big techs – in financial ecosystems raises key issues for public policy in terms of competition, consumer protection and financial stability. When developing an open finance ecosystem, authorities should encourage payment networks to evolve inside our financial ecosystem by promoting the necessary regulatory and technological conditions to avoid concentration, vertical integration and lack of interoperability. Under this approach, efficiency gains would translate into improved financial services and inclusion on a sound footing.
- iv. **Ensuring business continuity with large foreign providers.** The failure or interruption of payment or financial market infrastructures with systemic operations could have substantial financial stability implications with significant spillovers. Operational risks are observed throughout all the building blocks necessary to provide clearing and settlement payment services. For that reason, infrastructures should implement robust business continuity plans to provide a very high availability level.
- v. **Global coordination to address jurisdictional gaps.** Operational disruption could have substantial spillovers for both the domestic economy and other jurisdictions. The source of such risks – particularly those related to legal or operational issues – could also be in a jurisdiction different from the one affected by said issues. For example, big tech firms operating across multiple jurisdictions could increase the risk of gaps in supervisory oversight. For effective monitoring of big tech financial services activities, efficient cooperation between regulators across jurisdictions is extremely important to ensure that new risks are regulated equally. Also, new frameworks and standards need to be developed.
- vi. **Client protection.** Risks concerning consumer protection may be larger in the case of big tech firms' activities, as once these firms have access to the whole set of data, it will be difficult to constrain its use. Thus, authorities must regulate the use of financial data to avoid its continued misuse. It is just as relevant to promote robust and transparent data governance frameworks to provide clarity regarding the use of consumer data, thus enhancing consumer confidence.
- vii. **Cyber security.** Since the number and severity of cyber security incidents affecting the operation of all types of companies have been increasing, information technology security is a priority across industries and for the entire financial system. Setting minimum standards is crucial to avoid contagion and risks to the systems. Thus, cyber and operational security should be addressed on three levels: i) the owner(s) of the infrastructure(s); ii) the participants (by setting minimum requirements); and iii) the users. Even though all levels require the implementation of measures to make cyber security robust, the users' level could be the weakest link of the chain and addressing their inherent problems would require creative solutions depending on their needs.

Banco de México' payments strategy to achieve our vision is based on four pillars. This strategy implies an architecture that may contribute to integrate payment and financial services and ecosystem for innovation.

- i. A robust **infrastructure for clearing and settlement** for low-, medium- and large-value payments. 24/7 services, extremely high levels of availability, and the capability to act as a hub for the innovation of payment services are means to address payment demands to the final users. This infrastructure should be fully scalable, and where exists a technological leveled-playing field in benefit of clearing and settlement practices, preserving expeditious processing.
- ii. Strong **authentication and validation infrastructures** to achieve a smooth implementation of digital identity that also allows linking of digital information such as biometrics and transactional data from clients. Such a procedure would imply having a clear characterisation of clients' payment performance and risk profile to allow them to climb on the financial inclusion pyramid. This identification infrastructure will contribute to make know-your-customer and authentication processes more efficient and secure; enabling sheltered and regulated exchanges of information to strengthen the prevention of illicit activities, prioritizing users' personal data protection.
- iii. **Open finance arrangements ready to provide network access to new participants**, including big techs. In this context, the development of application programming interfaces (APIs) for payment initiation would set the capacity to connect to the payment networks (ie the real-time gross settlement system) through direct or tiered participation. Standardised APIs would also contribute to setting a level playing field in terms of security standards and technological requirements as well as robust procedures for validation. Open finance would ease the provision of secure and interoperable financial services through third-parties. The above-mentioned in order to have certainty about the security of the ecosystem and integrity of the connections between participants, working on the necessary regulatory and technological conditions that ensure private payment networks are part of the financial systems.
- iv. **Capacity to operate ledger services for a CBDC infrastructure.** It represents an innovation within the central banks and its development must be consistent with promoting the proper functioning of the payment system. From a retail perspective, in particular, that could be used to implement a digital payment solution to address financial inclusion challenges.

3. Key features for an architecture to develop a CBDC in Mexico

The cornerstone for a healthy ecosystem is a safe and robust infrastructure capable of addressing the challenges of extending the payment and financial ecosystem to CBDCs' alternatives. Reaping the benefits of CBDCs and digital payments in Mexico comes with the implicit requirement of fostering public payments infrastructure.

The project for the implementation of a CBDC in Mexico is under a definition phase, as initial analysis, explorations and the design of possible functionalities and capabilities for the CBDC are taking place.

The key features for the CBDC project are proposed as follows:

- The design is focused on a solution for retail payments, looking for its use to be concentrated on individuals and businesses.
- The specific implementation must be flexible, so it is envisioned that an account-based system can work in parallel to a token-based system, in order to meet the particular needs of the users.
- An architecture where the liability remains at the Central bank is proposed, as well as an Open Finance ecosystem in which financial and non-financial intermediaries can participate into the CBDC scheme including activities such as the initiation of transfers and administration of balances.
- It will seek to leverage the cybersecurity, resilience and operational continuity measures that have already been tested and have proven their efficiency in other systems, transferring their advantages to the scheme itself.

Our CBDC proposal is designed to have an incremental development, where the functionalities of the infrastructures currently operating in the market are extended and improved in order to mount CBDC solutions on them.

The first enhancement envisaged is the possibility to make transfers by indicating a beneficiary's identifier, such as the cell phone number; where an intermediate settlement element could be used, in which a record of the resources associated with the mentioned beneficiary's identifier is kept. The above to build a relational database that can facilitate the delivery of resources to a given beneficiary with only one element of its information, which can be strengthened with the implementation of a digital identity scheme.

Also, the generation of tokenized payment orders is expected to be allowed, in order to generate a secure cryptographic information element to represent a liability in Banco de México's balance sheet. This tokenized payments' scheme requires both new message architecture for the transmission of value and a ledger to avoid double spending. Therefore, improvements in payment settlement infrastructures are being considered to allow immediate operations.

Lastly, the incorporation of the previous enhancements with the development of instances to instruct operations by users will allow the development of CBDC registers; where the adoption by users and merchants will rely on third-party developments in which they can offer products and services as accessories to the CBDC functions that solve the specific needs of their clients and users. Also, financial institutions will have a key role on the conversion and reconversion of available balances within deposit accounts to the central bank's digital currency.