

Can central bank digital currencies help advance financial inclusion?

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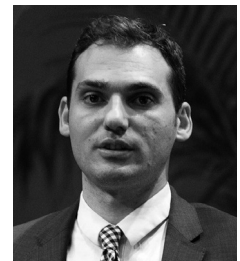
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ABSTRACT

Central banks around the world are considering how retail central bank digital currencies (CBDCs) may help to advance financial inclusion. While CBDCs are not a magic bullet, they

could be a further tool to promote universal access to payments and other financial services if this goal features prominently in the design from the get-go. In particular, central banks can consider design options to: (1) promote innovation in the two-tiered financial system (eg allowing for non-bank payment service providers); (2) offer a robust and low-cost public sector technological basis (with novel interfaces and offline payments); (3) facilitate enrolment (via simplified due diligence and electronic know-your-customer processes) and data portability; and (4) foster interoperability (both domestically and across borders). Together, these features can address a range of specific barriers to financial inclusion: geographic remoteness, institutional and regulatory factors, economic and market structure issues, characteristics of vulnerability, lack of financial literacy and low trust in existing financial institutions. This paper draws on interviews with nine central banks with advanced work on CBDCs and financial inclusion — the Central Bank of the Bahamas, Bank of Canada, People's Bank of China, Eastern Caribbean Central Bank, Bank of Ghana, Central Bank of Malaysia, Bangko Sentral ng Pilipinas, National Bank of Ukraine and Central Bank of Uruguay. It gives concrete examples from the central banks' work and discusses challenges, risks and regulatory and legal implications. It argues that while CBDCs hold promise for furthering financial inclusion, CBDC issuance may also require new laws and regulations to be enacted, or existing laws to be revised.

Keywords: digital currencies, financial inclusion, universal access, payments, central banks

INTRODUCTION

Around the world, central banks are exploring the issuance of new digital currencies that are a direct liability of the central bank.¹ Such central bank digital currencies (CBDCs) can be intended for use by financial institutions only (wholesale CBDC) or by households and businesses

(general purpose or retail CBDCs). Different institutions have different views on the motivation for their research and development of CBDCs. Yet the most common responses are greater domestic payments efficiency, payment safety and robustness and — particularly in emerging market and developing economies (EMDEs) — promoting financial inclusion.^{2,3}

Indeed, long before CBDCs were first under discussion, financial inclusion has been a key policy goal for many central banks. Financial inclusion means that 'individuals and businesses have access to useful and affordable financial products and services that meet their needs — transactions, payments, savings, credit and insurance — delivered in a responsible and sustainable way'.⁴⁻⁸ Digital payments are often the entry point for digital financial services and provide the infrastructure or 'rails' through which additional products and use cases can be developed (eg credit, insurance, savings products). Thus, digital payments not only provide individuals and businesses with convenient and affordable channels by which to pay and be paid, but also benefit the financial health of individuals and businesses by facilitating access to other financial services beyond payments. Governments can use digital payments to increase efficiency and accountability in various payment streams, including for the receipt of tax payments and disbursement of social transfers.

In the past decade, disruptive FinTech innovations have already driven impressive progress in financial inclusion, particularly in EMDEs. According to the World Bank's Financial Inclusion Index (Findex), the share of adults with a transaction account rose from 51 per cent in 2011 to 76 per cent in 2021.^{9,10} Most of this progress was driven by new digital technologies, often supported by government and central bank policies.^{11,12} In several markets across Sub-Saharan Africa and Asia, mobile money, agent-based distribution models, payment applications and

quick response (QR) codes have significantly improved access to and use of digital payment channels, and as a result, digital transaction accounts. There is evidence that this has contributed to poverty reduction and greater resilience of households.^{13–15} In India, the public sector-led transformation of the financial infrastructure has provided the foundations needed to significantly increase bank account penetration from 10 per cent to 80 per cent in just over a decade.^{16,17} In Brazil, the launch of the Pix instant payments system has helped 50 million adults make their first-ever digital payment.¹⁸

Still, there are an estimated 1.4 billion adults globally without access to financial services.¹⁹ And even among those who do have access to a transaction account, there are gaps in the quality and range of available financial services. This relates to a number of specific barriers to financial inclusion, such as geographic remoteness, institutional and regulatory factors, economic and market structure issues, characteristics of vulnerability, lack of financial literacy and low trust in existing financial institutions. Could CBDCs help to address these barriers? Alternatively, if CBDCs are to be issued, how could they be designed to tackle such barriers?

This paper draws on conversations with nine leading central banks from around the world that are active in the research and development of CBDCs, to assess how CBDCs could be designed to advance financial inclusion. We combine structured interviews with insights from desk research to gain insights into the potential of retail CBDCs to support financial inclusion. Among central banks, we find differing views. Some central banks consider CBDCs as key to their mandate as a catalyst for innovation and economic development. Other central banks see CBDCs more as a potential complement to existing financial inclusion initiatives.

Overall, we argue that CBDCs can help to promote financial inclusion if designed with

this goal from the outset and complemented with other relevant reforms and initiatives. In particular, central banks can consider design options to: (1) promote innovation in the two-tiered financial system (eg allowing for novel non-bank payment service providers); (2) offer a robust and low-cost public sector technological basis (with novel interfaces and offline payments); (3) facilitate enrolment (via simplified due diligence and electronic know your customer) and data portability; and (4) foster interoperability (both domestically and across borders). These options are not exclusive to CBDCs; some could be achieved with other reforms, including fast payment systems. With such design measures, however, CBDCs could represent a further tool in the financial inclusion policy toolkit.

This study contributes to the nascent literature on CBDC design and financial inclusion. The work assesses the potential role of CBDCs in specific regions — such as the USA and Sub-Saharan Africa.^{20–22} We go beyond the existing literature, taking a global perspective based on conversations with central banks from both EMDEs — namely the Central Bank of the Bahamas (CBB), People's Bank of China (PBC), Eastern Caribbean Central Bank (ECCB), Bank of Ghana (BoG), Bank Negara Malaysia (BNM), Bangko Sentral ng Pilipinas (BSP), National Bank of Ukraine (NBU) and Central Bank of Uruguay (CBU) — and from an advanced economy — namely, Bank of Canada (BoC). Moreover, we show how central banks could consider inclusion in CBDC design from the outset. We also discuss the challenges and risks of implementing CBDC with a financial inclusion objective and the legal and regulatory changes to address them.

The next section of this paper analyses barriers to financial inclusion and existing policies to address them. This is followed by a discussion of CBDC design considerations to promote financial inclusion. The

paper then turns to the challenges and risks of CBDC issuance for financial inclusion purposes and the legal and regulatory implications. The final section concludes.

BARRIERS TO FINANCIAL INCLUSION

Globally, 1.4 billion adults lack access to the financial system. Such access has been improving over time, although it has not always translated into more use of the digital payment instruments and services that come with such accounts. In some countries discussed in this study, over half of adults lacked access to a transaction account. Yet mobile phone ownership is often higher

than transaction account ownership. Mobile phones (both smartphones and basic ‘feature phones’) can help users to access payment services without visiting a physical bank branch, and mobile money has been an important driver of progress on transaction account access. Mobile ownership is also far from universal in most countries. Finally, the use of digital payments often lags transaction account coverage due to high fees or limited usability and many accounts are therefore inactive (Figure 1).

The barriers to financial inclusion differ across countries, but a number of common themes could be identified from the interviews. These can be grouped as follows:

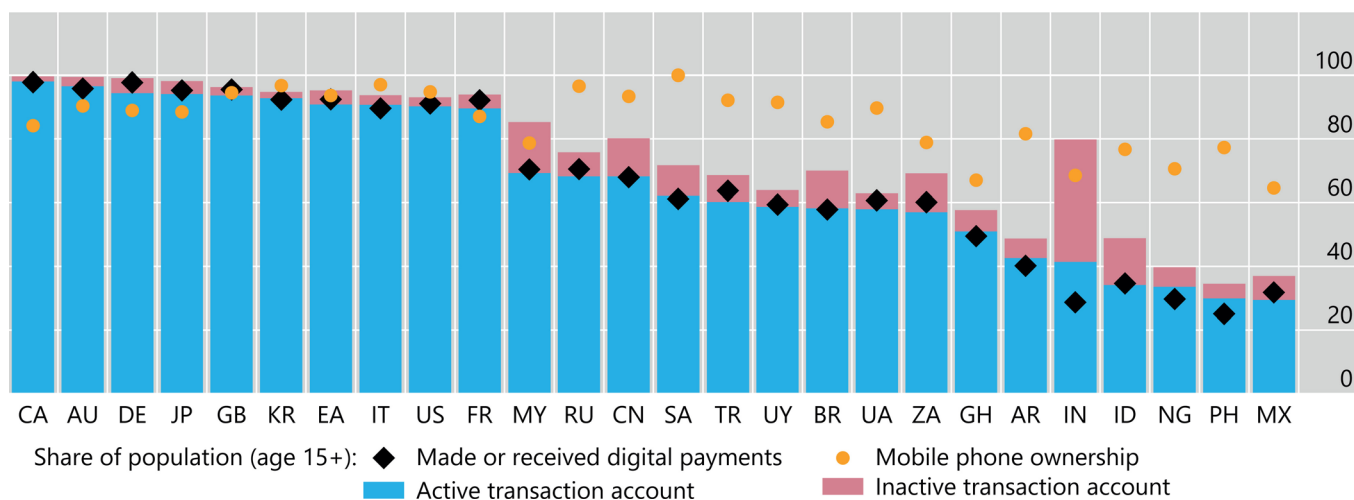


Figure 1: Showing how mobile phone penetration is often higher than account access and use of digital payments (figures given as a percentage, based on data for 2017)

AR, Argentina; AU, Australia; BR, Brazil; CA, Canada; CN, China; DE, Germany; FR, France; GB, Great Britain; GH, Ghana; ID, Indonesia; IN, India; IT, Italy; JP, Japan; KR, Korea; MY, Malaysia; MX, Mexico; NG, Nigeria; PH, Philippines; RU, Russia; SA, Saudi Arabia; TR, Türkiye; UA, Ukraine; US, United States; UY, Uruguay; ZA, South Africa. For euro area (EA), simple average of the member countries.

Made or received a digital payment — share of respondents reporting using mobile money, a debit or credit card, or a mobile phone to make/receive a payment from an account, or report using the internet to pay bills or to buy something online or in a store, in the past year.

Mobile phone ownership — share of respondents with a mobile phone.

Active transaction account — difference in the share of respondents with an account at a bank or another financial institution and share of respondents with an inactive transaction account.

Inactive transaction account — share of respondents reporting neither a deposit into nor a withdrawal from their account in the past year, including making or receiving any kind of digital payment.

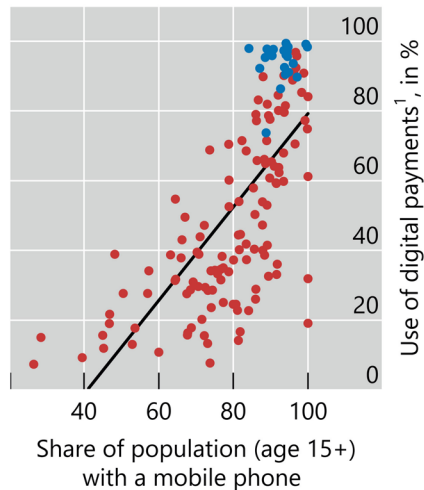
Sources: World Bank, Findex, authors' calculations

- *Geographic barriers:* Many of the countries in our sample have vast territories (eg Canada or China) or a large number of islands (eg the Bahamas, Eastern Caribbean Currency Union or the Philippines). Especially for households and businesses in remote, rural areas and on islands, there may be severe challenges around data connectivity (fixed broadband or mobile data access), physical branches of financial institutions and even reliable access to electricity. For people in these areas, cash is often a much more convenient means of payment than bank money or digital applications that require a computer or mobile phone. This is reflected in lower access to and use of digital payments (Figure 2, left-hand panel). Account access and use are also highly correlated (Figure 2, centre panel).

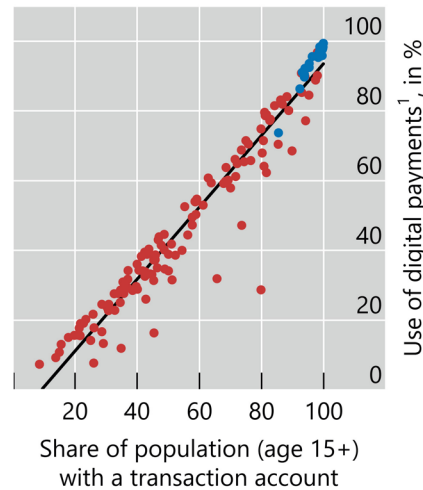
In many cases, the telecommunications service in remote geographic areas is inadequate even for feature-phone based mobile money services;

- *Institutional factors:* In many jurisdictions, basic public goods like identification (ID) are absent or not widespread. Some individuals lack an ID document or credentials to meet the basic know-your-customer (KYC) requirements to open a transaction account (Figure 2, right-hand panel). In many cases, the large informal economy does not require formal ID credentials to transact, and households and firms often have concerns about the compliance costs associated with formalising such activities. In general, regulatory gaps or weak regulatory frameworks, particularly for non-bank financial institutions, also hinder financial inclusion.

(a) Use of digital payments* rises with greater mobile ownership ...



(b) ... and with greater access to transaction accounts



(c) National identity cards are near-universal in many countries, but gaps still persist†

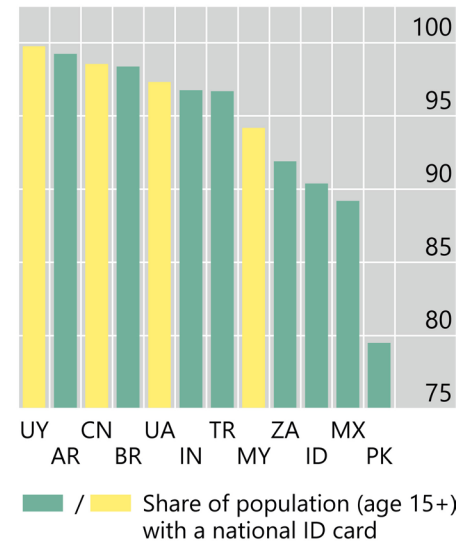


Figure 2: Showing how access to digital financial services is dependent on: (a) mobile phone penetration; (b) financial inclusion; and (c) the ownership of ID credentials (figures given as percentages, based on data for 2017)

*Use of digital payments defined as share of population (age 15+) that made or received a digital payment in the past year.

†Pale bars correspond to countries that have been interviewed for this project

Source: World Bank, Findex

In particular, where consumer protection regulation is not well developed, individuals and businesses may not be willing to use transaction accounts even where they are available;

- *Economic and market structure barriers:* In many EMDEs and some advanced economies there is limited competition in the financial sector. This results in high markups (margins) by banks and other financial institutions, visible in a high cost of executing payments and a large wedge between lending and deposit rates for households and businesses. In many cases, low efficiency may mean that it is not profitable to serve low-income users, and a lack of competition among incumbent financial institutions can mean high prices and poor services. For example, the ECCB pointed to complacency by the private sector and a bank-centric model, which has resulted in lack of innovation, lack of competition and high end-user prices. Even in a competitive landscape, banks may invest considerable resources

in attracting high-income users, but very little to serving the lower end of the market. Competition from the entry of new types of providers or business models might be beneficial;

- *Characteristics of vulnerability:* Many central bank counterparts emphasised gaps in inclusion by age (with older users and youth often excluded or underserved), gender (with women often excluded or underserved) or region (with rural users underserved relative to those in urban areas). In many cases, these gaps are also present in new FinTech services.^{23–25} Individuals with lower incomes universally have lower access to transaction accounts, although the gap is larger for EMDEs than advanced economies (Figure 3, left-hand panel). Women are less likely to have used the internet to buy something in the past year (Figure 3, right-hand panel). Some central banks discussed the challenges in accessing financial services for those with disabilities like visual and hearing impairments, or a lack of formal education;

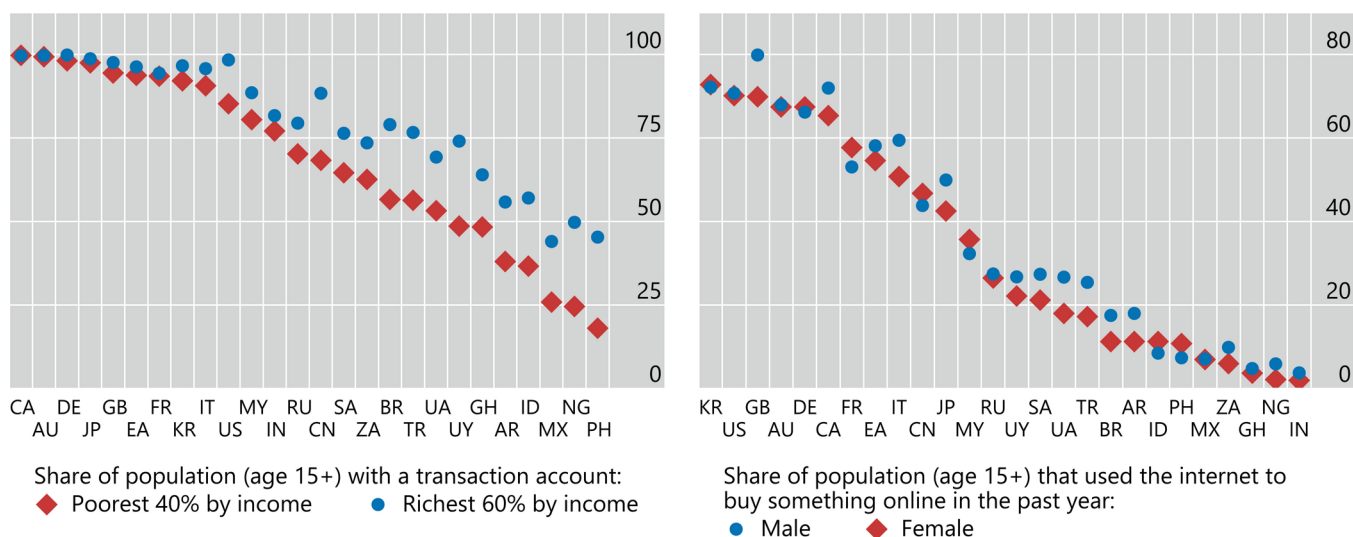


Figure 3: Showing how account access and digital payments use vary by income and gender: (a) lower-income users are less likely to have access to a transaction account; (b) women often have less access to online commerce (figures given as percentages, based on data for 2017)

Source: World Bank, Findex

- *Limited financial literacy:* In several cases, central banks emphasised a low level of financial and digital literacy, for instance around how to save and borrow, how to understand and compare financial offers or how to prepare for unexpected life events. Several referred to a ‘cash mindset’ among households, who see cash as easy to use and helpful for budgeting or controlling spending;
- *Limited trust in financial institutions:* Some central banks explicitly referred to low trust in existing financial services and institutions as a barrier to account access.²⁶ Where users have experienced bank failures, fraud, hidden fees or discriminatory treatment, they may be particularly wary of using these institutions’ services.

Public authorities are tackling these barriers with dedicated strategies and a range of policy tools. In many cases, central banks are working with other public authorities and the private sector.²⁷ Such policies generally aim to support universal access to and frequent use of transaction accounts, and thus to support overall financial inclusion and consumer welfare.

DESIGN FEATURES TO ADDRESS BARRIERS

The interviews for this study took place between September and December 2021. The central banks interviewed were at different stages of CBDC implementation: the CBB is the first jurisdiction to implement a CBDC; the CBU, PBC, NBU and ECCB have all undertaken pilots; BoC is consulting with stakeholders; and the BSP, BNM and BoG are researching the potential of a CBDC.

Other payment innovations could also achieve inclusion objectives, and gaps could be addressed through regulation and sound oversight arrangements. Yet as a public sector-led initiative, CBDCs may present

a unique and novel approach for tackling financial exclusion. Addressing persistent barriers to financial inclusion is a major motivation for the CBB, ECCB, BoG and PBC, while it has been less of a driving force for CBU and NBU. The BSP and BNM highlighted the use of existing innovations to address their specific issues. The BoC recognised CBDC’s potential for addressing the country’s particular access challenges.

Several design features and supporting policies were mentioned as important to ensuring that CBDC address financial inclusion. These design features target four broad objectives that, in turn, address specific financial inclusion barriers discussed previously.

Promoting innovation in a two-tiered payment system

Most of the central banks consider two-tiered CBDC designs that leverage on the existing system. All jurisdictions were considering a ‘hybrid’²⁸ model in which regulated intermediaries handle retail payments and the central bank issues the CBDC and keeps a central ledger of all transactions.^{29,30} Regulated intermediaries would distribute the CBDC either through their own technology or relying on the retail payments infrastructure of the central bank.^{31–35} Because CBDCs are a liability on the issuing central bank, intermediaries do not hold the customers’ funds and are not subject to credit risks. Accordingly, there may be room for central banks to license new types of intermediaries to serve CBDC clients without implying credit or liquidity risks. These may be subject to lighter prudential requirements.

Channels and access devices would need to be distinct from the existing ones for resiliency. For example, transactions could occur via novel payment apps running even with low internet bandwidth, via feature phones or with pre-paid cards. Regardless of the access channel, the CBDC user experience should be like existing digital payments.

Gaining access to the system would involve identification, there should be 1:1 convertibility with other instruments, and it should be possible to pay via different methods.

Offering a robust and low-cost public sector technological basis and novel interfaces

Some central banks argued that to ensure universal access, CBDC issuance may be considered as part of their mandate of innovation and development. Many are still designing the fee structures and pricing models. The cost of facilitating transactions could either be fully recovered from end users, absorbed by the service providers, absorbed by the public sector, or a mix of these approaches.

The provision of solutions akin to cash was mentioned as an important feature of several CBDC initiatives. Policy interventions to provide fee-free services were therefore being considered or have been implemented. These are usually limited to person-to-person (P2P) payments, however, with pricing for business and merchant payments set by payment service providers (PSPs). The CBB's sand dollar pilot offered free person-to-person (P2P) transactions.^{36,37} The ECCB's DCash pilot required fee-free transactions for persons and merchants.^{38,39} Central banks should ensure a sustainable pricing model for users and intermediaries.

Application programming interfaces (APIs) are financial intermediaries' main standard to access CBDC platforms. APIs are sets of protocols that allow different applications to securely communicate with each other. They can also enable data-sharing by different parties, thus allowing selective access to specific data needed to execute financial transactions. This ultimately benefits consumers through greater competition, lower costs and a broader range of services.

Infrastructure options (Figure 4) span from conventional centrally controlled databases to those based on distributed ledger

technology (DLT). It is unclear whether DLT offers unconditional advantages for a CBDC.^{40,41} A centralised market is typically superior unless it is difficult to enforce contracts (eg weak legal frameworks). This is DLT's main purported strength (ie enhanced robustness and lower cost of achieving good governance in a decentralised network of validators). However, transaction throughput in DLT-based systems is lower due to synchronisation between all entities' nodes. The primary risk of a traditional design is the failure of the central access point, but the consensus mechanism is DLT's fundamental weakness. Access can be based on cryptographic tokens or on identity.

No central bank anticipates a design where intermediaries have access to both personal and transaction information. The CBB and ECCB have access to the full ledger of retail transactions in principle, but individual users are denoted by an anonymous address only. The central banks only monitor aggregate data. Meanwhile, account holders' identities are accessible only by the institution that established the accounts. If other institutions, eg law enforcement agencies, need access to individual transaction information, they require a court order, and can collect this separately from the central banks and intermediaries.

Many central banks interviewed are exploring how users can access CBDC. In addition to smartphones, the PBC is considering e-ink display cards (a display technology that looks like paper and is commonly used in e-readers) and other smart devices. In the Bahamas, customers can access the sand dollar through a smartphone application (based on the CBB's client wallet module) or through a physical card.⁴² In Ghana, CBDC will be available through bank apps, FinTech payment apps, cards, wearables and wallets accessible via feature phones (similarly to existing private e-money).

Offline functionality is considered critical to address financial inclusion barriers in

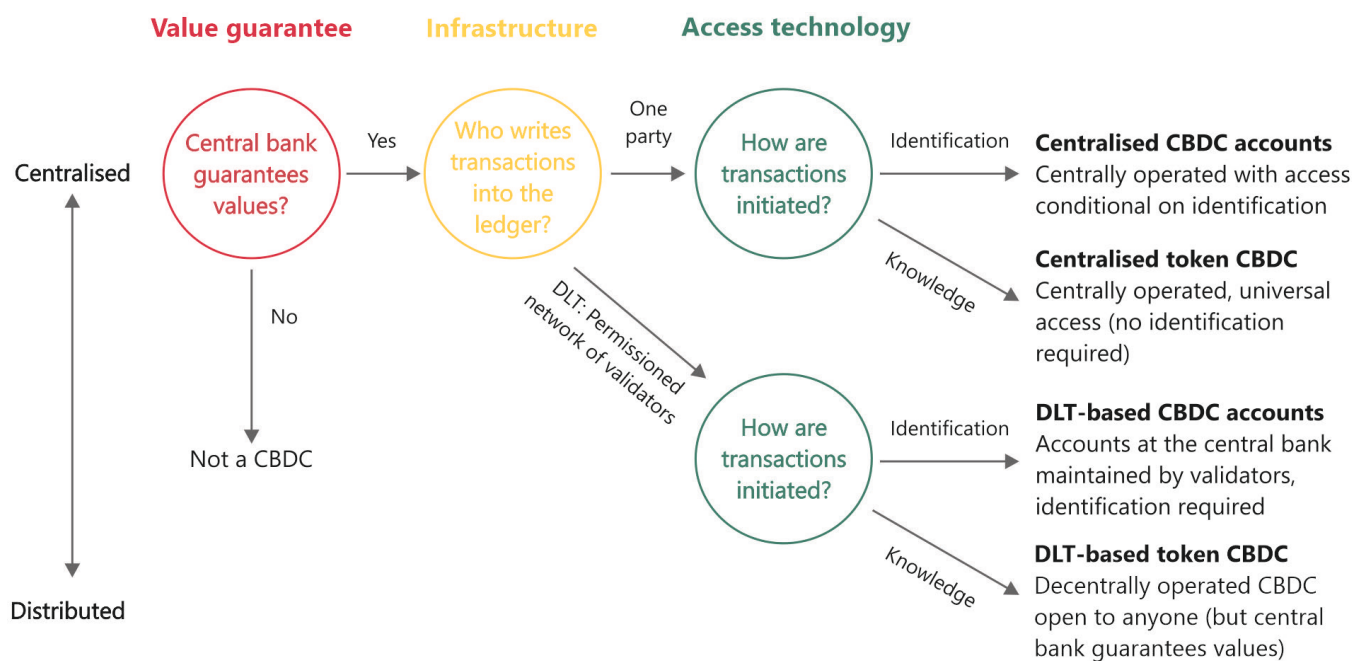


Figure 4: Elements of decentralisation: DLT and token-based access

This image maps out the four possible combinations of whether a CBDC infrastructure is distributed or centralised and whether access is based on identification (accounts) or cryptographic knowledge (digital tokens). All four combinations are possible for any CBDC architecture (indirect, direct or hybrid), but in the different architectures, the central bank and the private sector operate different parts of the respective infrastructure.

Source: Auer and Böhme (2020) 'The technology of retail central bank digital currency', *BIS Quarterly Review*, March, available at: https://www.bis.org/publ/qtrpdf/r_qt2003j.htm (accessed 13th October, 2023)

environments with no internet, no mobile network coverage, and intermittent electricity. Any coherent solution should provide consistent access, limit the risk of double-spending, and impede the creation of fake tokens. The BoG is working with service providers to expand offline point-of-sale devices and agent networks into currently underserved rural regions.

Channelling public sector salaries, pensions, social protection grants, and levies to and from CBDC accounts can increase their access and usage. The ECCB and the NBU have been exploring this option.

Some central banks interviewed are considering programmability features of CBDC to enforce rules or conditions to payments. Programmability refers to the ability to automate or to direct transactions contingent on

certain pre-specified conditions. This can allow for a range of new features, including self-executing protocols. For example, the e-CNY pilot distributed CBDC through 'red envelopes' that would expire if unused. A CBDC system could also allow for simultaneous transfers from or to multiple users when certain conditions are met.⁴³

Customer enrolment and education on the use of CBDC

With respect to CBDC customer due diligence (CDD), the interviewed central banks are likely to maintain their existing legal and regulatory anti money-laundering (AML) frameworks and measures for combating the financing of terrorism (CFT), and they are not considering fully anonymised provision.⁴⁴⁻⁴⁶ The complexity of the CDD

process could depend on the features and limits of the account, and those allowing for higher volume/value of transactions and balances could be linked to fully KYC'ed bank accounts.

Licensed financial institutions would perform the CDD for all the countries interviewed. For example, in the Eastern Caribbean, agents will be paid a commission to complete KYC and exchange central bank digital and physical currency.

Remote onboarding of customers (e-KYC) was highlighted as an important CDD feature. In the Bahamas, new customers can send a selfie with a government-issued ID to their service provider for onboarding. In Ghana, the BoG plans to align access policies for any CBDC with its remote CDD framework.

Data portability was described as especially important to achieving financial inclusion objectives. Data portability refers to the ability of an individual to obtain their own transaction data from current data holders, such as financial service providers, and use ('port') this data for their own purposes, including with a variety of data users.^{47,48} In the Eastern Caribbean and the Bahamas, this was described as an enabled feature within CBDC customer wallets. Transaction histories are provided in a structured, machine-readable format that can be downloaded by wallet users. This can then be shared with other financial institutions to obtain access to additional financial services, such as credit facilities.

Some central banks are exploring novel ways to address geographical barriers to financial inclusion. In the Bahamas, licensed providers are required to periodically report financial inclusion targets, and the CBB can demand the extension of services to underserved regions. The BoC is exploring offering CBDC transaction accounts directly to those in underserved regions.

Several of the central banks highlighted as a critically important complement to

inclusive design, the creation of financial and digital literacy campaigns and outreach activities. Most central banks already have some initiatives to provide consumers and merchants with information on digital payments.

Fostering interoperability among multiple dimensions

A successful CBDC implementation would depend highly on the level of interoperability with other domestic payment systems and a reuse of the existing payment instruments and channels. To ensure ease of use of CBDC in payment transactions, the integration with back-end systems such as real-time gross settlement (RTGS) systems and commercial banks' core banking systems would be imperative. While using existing payment channels such as mobile banking and e-money apps, it would also be necessary to ensure that funds could be accessed at automated teller machines and point-of-sale terminals and cash agent networks to enable easy access to CBDC and minimise the overall implementation costs.

Interoperability with other CBDC systems is also an important objective in order to facilitate cross-border payments. For many of the interviewed central banks, their jurisdictions are large receivers of inbound remittances. Cross-border CBDC arrangements could be a tool to decrease the overall cost and time to receive remittances. Because these arrangements involve central banks and commercial banks/PSPs from two or more jurisdictions, cross-border CBDC systems could bring immediate settlement, provide competitive exchange rates and make the best use of existing domestic payment rails. Being a claim on the central bank, CBDC would eliminate credit risks between financial institutions participating in a cross-border transaction. Reducing risks would decrease transaction fees. These arrangements would also enable a large number of possible counterparts and could replace the

need for existing correspondent banking relationships.

CHALLENGES AND RISKS

For CBDC to support financial inclusion objectives, a well-developed ecosystem is important. This allows users to move easily into and out of CBDC, make transfers, pay merchants and send and receive payments to the government, among other things. This requires buy-in from both financial institutions and different enterprises including merchants, which in turn would make it more attractive for the public to use a CBDC. However, achieving large-scale adoption by relevant parties could be a challenge.

Financial institutions, for example, may have different reasons for not immediately participating in central banks' CBDC projects. The requisite infrastructure to connect to the CBDC system might be too expensive to put in place. There might be a mismatch in expectations regarding incentives for providing intermediation services and the objective of central banks for CBDC transaction fees to approximate those associated with cash. Central banks would need to engage financial institutions at early stages of the project and ensure the business model is viable for them. Central banks would also need to be sure that the CBDC system would not lead to excessive crowding out of private sector services.

In the case of merchants, they will probably be concerned about the costs of accepting CBDC payments. These relate to both the one-off cost (eg putting in place new hardware) and ongoing costs. These costs must be as low or lower than those of merchant services offered by existing third-party payment rails (eg by payment card companies). A CBDC will be more attractive to merchants if it is integrated with existing payment instruments that are already widely used (eg payment cards, e-money). In developing economies, many

low-value commercial transactions happen in the informal sector. It may be a challenge to achieve CBDC adoption in this part of the economy given the desire of some informal players for anonymity. Options including using specialised intermediaries to acquire merchants such as payment facilitators and applying simplified customer due diligence for onboarding small merchants, akin to that followed for low-risk transaction accounts for individuals, could be considered.⁴⁹

In the case of the public, CBDC wallet design and features could influence its willingness to use a CBDC. Wallet design considerations such as ease of use, convenience, predictability, a user-friendly interface and the inclusion of key use cases could lead to a positive experience for end users. CBDC wallets should be designed with due consideration of financially excluded groups through using a simple interface, in their language (including minority languages) and with appropriate information and support. End users should be shielded from having to deal with complex elements like cryptographic keys. Due consideration for the context of older users, children and people with disabilities is also required. Wallets that can provide voice guidance or commands to operate are important features to enable access of unserved or underserved users (eg the visually impaired) in the CBDC ecosystem. While central banks are not used to designing products for end users (with the exception of cash), they can assign the wallet design to commercial banks and other PSPs or use collaborative forums to work with such financial institution on requirements and standards for CBDC wallets.

A well-developed CBDC ecosystem, however, brings with it the challenge of protecting consumer data. One attraction of CBDCs for financial inclusion is that they create digital records of transactions. This could be a useful source of information to expand financial services such as credit to the unserved or underserved. However,

this information could also be subject to misuse or abuse — including by political authorities. The challenge for central banks, whether this information is kept by them or by private entities that are part of the CBDC ecosystem, is to keep this information safe in order to achieve the same level of public trust in the CBDC that physical cash enjoys. One way to do this might be through the separation between identity and transaction data. Regardless of how this is done, security and data protection measures are paramount for ensuring consumer trust and should be carefully designed and effectively communicated in consumer awareness campaigns.

Very far-reaching data privacy and data protection measures, on the other hand, could result in risks related to money laundering and the financing of terrorism. One extreme would be to have total anonymity of CBDC ownership and transactions. This would be fertile ground for illicit actors, who could go about their activities unhindered. Central banks recognise this risk and the importance of AML/CFT measures without sacrificing their financial inclusion objectives. Therefore, many are planning to put in place multiple tiers for CBDC holders with differentiated limits on CBDC balances or transactions, while having the lower tiers (ie those intended for financial inclusion purposes) subject to simplified due diligence requirements.

Addressing these challenges and risks through laws and regulations

Laws and regulations would need to be introduced or strengthened to address the challenges identified. These are on top of laws necessary to ensure that central banks have the appropriate legal powers to issue CBDC and oversee the CBDC system. For example, the central bank, banking and payment system laws and regulations, including those relating to roles and responsibilities of different players in the system, might need to be adjusted, where necessary.

Regulations may also need to be put in place or strengthened for financial institutions and other players that have a role to play in the CBDC system.

Laws and regulations that may need to be strengthened include those related to IT requirements, security and safeguards; AML/CFT requirements; and data protection rules (eg rules on data management, access, privacy and custody). New laws or regulations may also need to be introduced for novel players in the system (eg entities that may do onboarding and KYC procedures, particularly in remote areas). CBB, for example, has proposed regulations for financial institutions that would serve as sand dollar wallet providers.⁵⁰ The proposed regulations include provisions on eligibility criteria, technical standards, consumer protection, financial inclusion (eg requirement to serve target areas), obligations such as record-keeping and reporting etc.

To address data privacy and AML/CFT challenges, laws and regulations pertaining to these two areas may also need to be enhanced. In terms of data privacy, the concept of use agency might be extended to the use of CBDC. This means that users must be able to access and share their data arising from CBDC as they choose, and must be able to have them corrected, updated or deleted, if necessary. In terms of AML/CFT, changes might relate to e-KYC regulations, such as use of digital ID, applying remote on-boarding measures and tiered KYC for individuals and micro and small merchants.

CONCLUSION

Central banks have different objectives for issuing a CBDC, and financial inclusion is just one driver. Barriers to exclusion differ starkly, and it is therefore important to ensure a clear distinction between tackling pervasive exclusion problems, as seen in some EMDEs, and addressing pockets of exclusion, as observed in advanced economies.

If designed with inclusion in mind, CBDCs can form an addition to the policy toolbox to support access to payments and financial services for all.

This would mean a CBDC system designed in a way that involves bank and non-bank PSPs; offers a robust and low-cost public sector technological basis and novel interfaces; provides for low service fees; uses inclusive access policies; allows for remote registration; facilitates access of merchants, micro and small enterprises; enables access to special groups with limitations; facilitates data portability; and fosters interoperability with domestic and cross-border systems, without the unintended consequence of new forms of exclusion.

To understand how to do this effectively, more research will be required. This may cover the unique proposition (if any) and complementarity presented by CBDCs relative to other payments systems such as fast payment systems, and the business case for the private sector participation in CBDC-based systems. In particular, research may assess requirements and approaches for ensuring interoperability across different CBDC systems, particularly for cross-border payments.

AUTHORS' NOTE

The views expressed here are those of the authors and not necessarily of the Bank for International Settlements or World Bank Group.

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