



# The State of CBDCs in 2026

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Retail Adoption, Wholesale  
Settlement and Cross-Border  
Interoperability

September 2026

## Foreword

The evolution of digital assets is increasingly intersecting with the infrastructure on which the financial system itself operates. Tokenisation, stablecoins and new forms of settlement are raising questions that extend beyond individual technologies to the architecture of money and payments. Central bank digital currencies sit squarely within this transition, because they ask how public money should evolve as the systems around it change.

For CoinDCX, delving into this particular issue aligns with our objective to advance timely research that keeps pace with the digital asset ecosystem. To that end, *The State of CBDCs in 2026: Retail Adoption, Wholesale Settlement and Cross-Border Interoperability* captures the experience and evidence jurisdictions have accumulated over more than a decade of experimentation. It considers what different experiments have established, where central banks have changed direction, and where the underlying policy case remains unresolved. For India's digital rupee, these questions are especially relevant as it develops alongside a sophisticated domestic payments ecosystem and a growing policy focus on tokenisation.

I would like to express my sincere appreciation to Gauri S. Kumar from the Policy Team for her research and contribution to this report. I hope this publication supports a more grounded discussion of CBDCs within the wider evolution of digital assets and financial infrastructure, and helps policymakers, industry participants and other stakeholders distinguish technological possibility from durable economic and policy value.

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## Table of Abbreviations

| Abbreviation  | Meaning                                                        |
|---------------|----------------------------------------------------------------|
| AML/CFT       | Anti-money laundering and combating the financing of terrorism |
| BCB           | Banco Central do Brasil (Central Bank of Brazil)               |
| BCCH          | Banco Central de Chile (Central Bank of Chile)                 |
| BIS           | Bank for International Settlements                             |
| BoC           | Bank of Canada                                                 |
| BoE           | Bank of England                                                |
| BOI           | Bank of Israel                                                 |
| BOJ — Jamaica | Bank of Jamaica                                                |
| BOJ — Japan   | Bank of Japan                                                  |
| BOK           | Bank of Korea                                                  |
| CBDC          | Central bank digital currency                                  |
| CBN           | Central Bank of Nigeria                                        |
| CBUAE         | Central Bank of the United Arab Emirates                       |
| CHF           | Swiss franc                                                    |

|                      |                                 |
|----------------------|---------------------------------|
| CNY                  | Chinese yuan / renminbi         |
| DLT                  | Distributed ledger technology   |
| DT                   | Digital tenge                   |
| DvP                  | Delivery versus payment         |
| ECB                  | European Central Bank           |
| e-CNY                | Digital renminbi / digital yuan |
| e-HKD                | Digital Hong Kong dollar        |
| ₹                    | Digital rupee                   |
| ₹-Retail             | Retail digital rupee            |
| ₹-W /<br>₹-Wholesale | Wholesale digital rupee         |
| FX                   | Foreign exchange                |
| HKD                  | Hong Kong dollar                |
| HKMA                 | Hong Kong Monetary Authority    |
| JAM-DEX              | Jamaica Digital Exchange        |
| MAS                  | Monetary Authority of Singapore |

|       |                                                                                                  |
|-------|--------------------------------------------------------------------------------------------------|
| MVP   | Minimum viable product                                                                           |
| NBK   | National Bank of Kazakhstan                                                                      |
| PoC   | Proof of concept                                                                                 |
| PvP   | Payment versus payment                                                                           |
| QCB   | Qatar Central Bank                                                                               |
| RBA   | Reserve Bank of Australia                                                                        |
| RBI   | Reserve Bank of India                                                                            |
| rCBDC | Retail central bank digital currency                                                             |
| RTGS  | Real-time gross settlement                                                                       |
| SAMA  | Saudi Central Bank; abbreviation retained from its former name, Saudi Arabian Monetary Authority |
| SAR   | Special Administrative Region                                                                    |
| SARB  | South African Reserve Bank                                                                       |
| SDX   | SIX Digital Exchange                                                                             |
| SEBI  | Securities and Exchange Board of India                                                           |
| SNB   | Swiss National Bank                                                                              |

|       |                                         |
|-------|-----------------------------------------|
| UMI   | Unified Markets Interface               |
| UPI   | Unified Payments Interface              |
| wCBDC | Wholesale central bank digital currency |

## 1. Executive Summary

Central bank digital currencies (CBDCs) have evolved from a largely technical experiment into a broader policy question: what role should central-bank money play in financial infrastructure that is increasingly digital, tokenised and privately intermediated? As of May 2026, 146 countries and currency unions representing more than 98% of global GDP were exploring CBDCs, yet widespread experimentation has not translated into widespread issuance. Retail and wholesale CBDCs are also following increasingly different trajectories, reflecting distinct policy problems and use cases.

This report provides a status assessment of global CBDC development through 2026. It traces the evolution of retail and wholesale experimentation, maps major jurisdictional developments, examines cross-border and interoperability projects, and assesses the regulatory and design questions emerging as experiments approach live or production-adjacent infrastructure. India is considered separately as a test of CBDC additionality in a market where digital payments are already highly developed. The report does not seek to identify a superior jurisdiction, technological architecture or form of CBDC, nor does it assume that issuance is the natural endpoint of research. Its purpose is narrower: to assess what experimentation has established and to place CBDCs within a financial system that increasingly includes tokenised assets, commercial bank money, stablecoins and existing digital payment infrastructure.

Cross-border experimentation provides one of the clearest examples of how the CBDC debate has evolved. Early generation projects have demonstrated that different systems can be connected and multiple currencies can settle across shared or interoperable infrastructure. But they have also shown that interoperability does not require every currency to sit on a common ledger, or, in some cases, require CBDCs at all. Cross-border CBDC development is therefore increasingly becoming a question of how sovereign monetary systems can interoperate while retaining domestic control, rather than one of constructing a single common international currency architecture. The central cross-border question is no longer simply whether different digital currencies can transact, but whether sovereign monetary systems can become interoperable without requiring jurisdictions to surrender control over their currency, infrastructure or regulatory responsibilities.

For retail CBDCs, the evidence is more mixed. National issuance in the Bahamas, Nigeria and Jamaica has demonstrated operational feasibility, but not sustained mass usage. Merchant acceptance, network effects, consumer incentives and the availability of established alternatives remain important constraints. Later pilots offer more use-case specificity, testing offline payments, public transfers, programmability and interoperability with existing payment

networks. The emerging test is therefore additionality: whether a retail CBDC provides a capability or policy benefit that existing instruments cannot deliver as effectively.

For wholesale CBDCs, tokenisation is creating a more specific settlement problem. As securities, deposits and other financial assets move onto programmable infrastructure, central banks are examining how the cash leg of those transactions should settle. Wholesale CBDCs can support atomic delivery-versus-payment and payment-versus-payment arrangements and reduce dependence on separate reconciliation processes. Yet experimentation also shows that a standalone wholesale CBDC is not the only possible answer. Tokenised central-bank reserves, links to existing RTGS systems and combinations of public and private settlement assets are also being tested. The stronger conclusion is therefore that tokenised markets are creating demand for digitally compatible central-bank settlement, while the form through which it should be provided remains unsettled.

Taken together, these findings suggest that CBDC progress should no longer be measured principally by the number of launches. Retail deployment will depend on whether CBDCs generate sustained use and demonstrable additionality; wholesale development will depend on how central-bank settlement evolves alongside tokenised markets; and cross-border progress will increasingly depend on whether technically interoperable systems can also become legally, institutionally and operationally interoperable. The first decade of experimentation has established that central-bank money can change form; the next phase will determine where it actually needs to.

## **2. Introduction to CBDCs: From Experimentation to Deployment**

Central bank digital currencies have evolved considerably in the past decade. What started as an exercise in digitising sovereign money has become a wider debate about the role central-bank money should play in payment and settlement systems that are themselves becoming digital, tokenised, and increasingly private.

The motivations behind CBDCs have shifted as much as the technology itself. Early projects were driven largely by defensive concerns: preserving monetary sovereignty as cash use declined and private forms of payment grew rapidly, and improving financial inclusion in markets where large populations sit outside the formal banking system.<sup>1</sup> Geopolitical shifts

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<sup>1</sup>Guo, Y., Yousef, E., & Naseer, M. M. (2025). Cryptocurrencies and central bank digital currencies in global perspective. *Journal of Risk and Financial Management*, 18(11), Article 644. <https://doi.org/10.3390/jrfm18110644>

have since added a further layer, with some central banks viewing CBDCs as infrastructure for reducing dependence on foreign-controlled payment rails.<sup>2</sup>

That exploration has consistently split along two paths. Retail CBDCs (rCBDCs) are designed as central-bank money accessible to households and businesses for everyday transactions, much like cash.<sup>3</sup> Wholesale CBDCs (wCBDCs) are restricted to financial institutions and used for large-value settlement, a role that has grown more significant as securities, deposits, and other assets move onto tokenised infrastructure.<sup>4</sup> The two are not simply smaller and larger versions of the same idea: they solve different problems for different users, and their development has increasingly followed different trajectories.

What emerges are different policy questions. Retail projects are being tested against the needs of households, businesses and public-payment systems, while wholesale projects increasingly concern the interaction between central-bank money and new forms of financial market infrastructure. Understanding CBDC development in 2026 therefore requires treating the two trajectories separately rather than assuming that they represent different stages of the same project.

## 2.1 What makes a CBDC different?

Most money used in modern economies is already electronic. Salaries arrive in bank accounts, retail payments move through cards and instant-payment systems like UPI, and banks settle obligations electronically with central banks.<sup>5</sup> What makes a CBDC distinct is therefore not simply that it exists electronically, but who issues it and whose liability it represents.

Money held in a commercial bank account is a claim on that bank. A CBDC is a direct liability of the central bank, placing it in the same category of public money as physical notes and coins.<sup>6</sup>

This distinction matters because central-bank money carries no credit risk against a private issuer and provides the ultimate settlement asset for the financial system. A retail CBDC extends this direct central-bank claim to households and businesses in electronic form. A

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<sup>2</sup>Patchay, J. (2023, January 10). The geopolitics of CBDCs. Digital Pound Foundation.  
<https://digitalpoundfoundation.com/the-geopolitics-of-cbdcs/>

<sup>3</sup>Illes, A., Kosse, A., & Wierst, P. (2025, August 22). Advancing in tandem - results of the 2024 BIS survey on central bank digital currencies and crypto (BIS Paper No. 159). Bank for International Settlements.  
<https://www.bis.org/publ/bppdf/bispap159.pdf>

<sup>4</sup>Ibid.

<sup>5</sup>Bank for International Settlements. (2020). Central banks and payments in the digital era. In BIS Annual Economic Report 2020 (pp. 67–95). <https://www.bis.org/publications/central-banks-payments-digital-era.pdf>

<sup>6</sup>Reserve Bank of India. (2022, October 7). Concept note on Central Bank Digital Currency.  
<https://rbi.org.in/Scripts/PublicationReportDetails.aspx?UrlPage&ID=1218>

wholesale CBDC makes it available to eligible financial institutions on infrastructure designed for large-value or tokenised transactions.

CBDCs also differ from stablecoins and tokenised deposits, even where the user experience looks similar. A tokenised deposit is still a commercial-bank liability; tokenisation only changes the way that claim is recorded and transferred, not the underlying issuer.<sup>7</sup> A stablecoin is issued privately and depends on the quality of its reserves, redemption arrangements, governance, and regulatory safeguards.<sup>8</sup> A CBDC remains a claim on the central bank regardless of the underlying technology used to operate it.

This is particularly relevant in wholesale markets. Banks already settle conventional transactions using electronic central-bank reserves, which means that a wholesale CBDC does not create a central-bank settlement mechanism where none existed before.<sup>9</sup> Its potential value lies instead in making central-bank money compatible with new forms of financial infrastructure. Take, for example, a bond issued and transferred on a tokenised platform. Placing or connecting central-bank money via a wholesale CBDC to the same infrastructure could allow the asset and payment to move together, reducing the gap in which one side of the transaction may complete before the other.<sup>10</sup>

Notably, distributed ledger technology (DLT) is not a defining feature of a CBDC. Some projects use DLT; others do not.<sup>11</sup> The choice depends on what the system is expected to achieve, whether that be scale, privacy, programmability, or interoperability with other platforms. CBDCs are better understood first as a new representation or access model for central-bank money, and only then as a technology project.

## 2.2 From domestic experiments to tokenised settlement

Experiments with electronic central-bank money predate the present CBDC debate. In 1993, the Bank of Finland introduced the Avant stored-value card, an electronic form of cash and an early

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<sup>7</sup>0xKira. (2026, September 23). Tokenized deposits: What are they and how are they different to stablecoins? Arkham Intelligence. <https://info.arkm.com/research/tokenized-deposits-what-are-they-and-how-are-they-different-to-stablecoins>

<sup>8</sup> Ibid.

<sup>9</sup>Reserve Bank of India. (2022, October 31). Real Time Gross Settlement System (RTGS) system. <https://www.rbi.org.in/commonman/english/scripts/FAQs.aspx?Id=275>

<sup>10</sup>Bank for International Settlements. (2023). Blueprint for the future monetary system: Improving the old, enabling the new. In BIS Annual Economic Report 2023 (pp. 85–118). <https://www.bis.org/publications/blueprint-future-monetary-system-improving-old-enabling-new.pdf>

<sup>11</sup>Reserve Bank of India. (2022, October 7). Concept note on Central Bank Digital Currency. <https://rbi.org.in/Scripts/PublicationReportDetails.aspx?UrlPage&ID=1218>

CBDC precursor.<sup>12</sup> The project was eventually discontinued,<sup>13</sup> but it established the underlying idea decades before modern blockchain systems emerged.

Modern CBDC experimentation accelerated from the mid-2010s.<sup>14</sup> China's central bank began work that would eventually become the e-CNY,<sup>15</sup> Uruguay experimented with the e-Peso,<sup>16</sup> and central banks in Canada, Singapore, South Africa and elsewhere began testing DLT for wholesale settlement.<sup>17</sup> At this stage, much of the work was exploratory. Central banks were testing whether new technologies could reproduce functions already performed by cash or existing interbank settlement systems, and whether they could do so more efficiently.<sup>18</sup>

Experimentation then expanded across borders through projects such as Jasper-Ubin, Aber, Inthanon-LionRock and Dunbar.<sup>19</sup> Retail projects were evolving in parallel. The Bahamas launched the Sand Dollar in October 2020, followed by Nigeria's eNaira in October 2021 and Jamaica's JAM-DEX in 2022.<sup>20</sup> These launches established that a retail CBDC could be issued and distributed nationally but also exposed a harder problem. Building the infrastructure was only one part of deployment; households and merchants still needed a reason to shift transactions from payment methods they already used.<sup>21</sup>

The most recent phase has been shaped by tokenisation. As securities, deposits, and other financial assets begin to move onto programmable infrastructure, the payment side of these transactions must evolve with them. A tokenised bond may be transferred instantly, but settlement is not complete until the corresponding payment is final. This has led central banks

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<sup>12</sup>Stanley, A. (2022, September). The ascent of CBDCs. Finance & Development, 59(3).  
<https://www.imf.org/en/publications/fandd/issues/2022/09/picture-this-the-ascent-of-cbdcs>

<sup>13</sup> Ibid.

<sup>14</sup> Dionysopoulos, L., Marra, M., & Urquhart, A. (2024). Central bank digital currencies: A critical review. International Review of Financial Analysis, 91, Article 103031. [doi.org https://www.sciencedirect.com/science/article/pii/S1057521923005471](https://www.sciencedirect.com/science/article/pii/S1057521923005471)

<sup>15</sup>Bank of Canada. (n.d.). Digital currencies and fintech: Projects.  
<https://www.bankofcanada.ca/research/digital-currencies-and-fintech/projects/>

<sup>16</sup>Sarmiento, A. (2022, March). Seven lessons from the e-Peso pilot plan: The possibility of a Central Bank Digital Currency. Central Bank of Uruguay.  
<https://www.bcu.gub.uy/Sistema-de-Pagos/Documents/Vigilancia/Libros/CBDC%20march2022.pdf>

<sup>17</sup> Ibid.

<sup>18</sup> Ibid.

<sup>19</sup>Bank of Canada. (n.d.). Digital currencies and fintech: Projects.  
<https://www.bankofcanada.ca/research/digital-currencies-and-fintech/projects/>

<sup>20</sup> Dionysopoulos, L., Marra, M., & Urquhart, A. (2024). Central bank digital currencies: A critical review. International Review of Financial Analysis, 91, Article 103031. [doi.org https://www.sciencedirect.com/science/article/pii/S1057521923005471#bb44](https://www.sciencedirect.com/science/article/pii/S1057521923005471#bb44)

<sup>21</sup>Koonprasert, T., Kanada, T., Tsuda, S., & Reshidi, E. (2024, September 20). Central bank digital currency adoption: Inclusive strategies for intermediaries and users (FinTech Notes No. 2024/005). International Monetary Fund.  
<https://www.elibrary.imf.org/view/journals/063/2024/005/article-A001-en.xml>

to test whether central-bank money can be placed directly on tokenised platforms, or connected to them in ways that preserve settlement finality.<sup>22</sup>

The evolution of CBDCs has therefore been less linear than the familiar sequence of “research, pilot, and launch” implies. Each phase has introduced a new question: early experiments tested whether central-bank money could be issued or transferred differently; retail launches shifted attention towards adoption; cross-border projects introduced questions around interoperability and governance. Now, tokenisation is forcing a more fundamental assessment of how central-bank money should interact with financial infrastructure that may no longer resemble the systems for which existing settlement arrangements were designed.

## 2.3 Why central banks are exploring CBDCs

The case for CBDCs depends on the structure of the economy in which they are being considered. Central banks have therefore arrived at CBDC experimentation from different starting points.

Financial inclusion remains an important motivation in markets where access to conventional banking is uneven.<sup>23</sup> The Bahamas, as mentioned in Section 2.2, introduced the Sand Dollar in part to make electronic payments and public money more accessible outside the traditional branch network, given its population is dispersed across more than 30 inhabited islands, making physical banking infrastructure relatively costly to maintain.<sup>24</sup>

In more advanced economies, the decline of cash creates a different concern.<sup>25</sup> Cash is generally the only central-bank liability directly available to the public. As transactions migrate towards bank deposits, cards, and mobile payments, households become increasingly dependent on privately issued money and privately operated payment infrastructure. A retail CBDC offers one possible way to preserve public access to central-bank money even if cash becomes less widely used.<sup>26</sup> Sweden's e-krona work emerged partly from this context. The Riksbank has

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<sup>22</sup>Bank for International Settlements. (2025). The next-generation monetary and financial system. In BIS Annual Economic Report 2025 (pp. 77–113). <https://www.bis.org/publications/next-generation-monetary-financial-system.pdf>

<sup>23</sup>Koonprasert, T., Kanada, T., Tsuda, S., & Reshidi, E. (2024). Central bank digital currency adoption: Inclusive strategies for intermediaries and users (FinTech Notes No. 2024/005). International Monetary Fund. <https://www.imf.org/-/media/files/publications/ftn063/2024/english/ftnea2024005.pdf>

<sup>24</sup>Soderberg, G., Bechara, M., Bossu, W., Che, N., Davidovic, S., Kiff, J., Lukonga, I., Mancini-Griffoli, T., Sun, T., & Yoshinaga, A. (2022, February). Behind the scenes of central bank digital currency: Emerging trends, insights, and policy lessons (FinTech Notes No. 2022/004). International Monetary Fund. <https://www.imf.org/-/media/files/publications/ftn063/2022/english/ftnea2022004.pdf>

<sup>25</sup>Group of Central Banks. (2020). Central bank digital currencies: Foundational principles and core features (Report No. 1). Bank for International Settlements. <https://www.bis.org/publications/othp33-summary.pdf>

<sup>26</sup>Committee on Payments and Market Infrastructures & Markets Committee. (2018, March). Central bank digital currencies. Bank for International Settlements. <https://www.bis.org/publications/central-bank-digital-currencies.pdf>

examined whether an e-krona could preserve access to state-issued money, improve resilience, and provide an additional payment option if private systems fail.<sup>27</sup> In 2026, however, it stopped short of recommending issuance but called for preparatory legal work so that Sweden could introduce an e-krona within a reasonable period if future conditions create a stronger need.<sup>28</sup>

Payment sovereignty has added a further consideration. The digital euro is being developed partly against Europe's reliance on international card networks and other non-European payment providers.<sup>29</sup> The growth of stablecoins and other digital assets has reinforced these pressures. In the BIS's latest global survey, more than one-third of participating central banks reported accelerating CBDC work in response to developments in stablecoins and other crypto assets.<sup>30</sup> The concern is not simply technological competition. If privately issued, particularly foreign-currency-denominated, payment instruments become widely used, they can affect domestic payment sovereignty and the continued role of central-bank money as the anchor of the monetary system.<sup>31</sup>

Central banks are also testing whether retail CBDCs can provide capabilities that existing electronic payments do not offer as easily.<sup>32</sup> Offline functionality, for instance, can support payments during network outages or in areas with weak connectivity, strengthening resilience, accessibility and cash-like usability. BIS research found that 49% of surveyed central banks considered offline retail-CBDC payments vital and a further 49% considered them advantageous.<sup>33</sup> Programmability can support targeted transfers or payments triggered by predefined conditions. Yet these capabilities, as Hong Kong's e-HKD pilot revealed, are not

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<sup>27</sup> Sveriges Riksbank. (2026, June 29). The e-krona – state money in digital form.

<https://www.riksbank.se/en-gb/payments--cash/e-krona/?utm>

<sup>28</sup> Ibid.

<sup>29</sup> European Parliament. (2026, June 23). Digital euro: MEPs want to ensure sovereignty, privacy and financial stability [Press release].

<https://www.europarl.europa.eu/news/en/press-room/20260622IPR45912/digital-euro-meps-want-to-ensure-sovereignty-privacy-and-financial-stability>

<sup>30</sup> Illes, A., Kosse, A., & Wierds, P. (2025, August). Advancing in tandem – results of the 2024 BIS survey on central bank digital currencies and crypto (BIS Papers No. 159). Bank for International Settlements. <https://www.bis.org/publications/paper-159-advancing-tandem-results-2024-bis-survey-central-bank-digital-currencies-and-crypto.pdf>

<sup>31</sup> Ibid.

<sup>32</sup> Nikitin, D., Schmalholz, J., & Bloch, C. (2025, October). Can retail central bank digital currencies improve the delivery of social safety nets? (IMF Working Paper No. WP/25/211). International Monetary Fund.

<https://www.imf.org/-/media/files/publications/wp/2025/english/wp25211-source-pdf.pdf>

<sup>33</sup> Bank for International Settlements. (2023, May 11). Project Polaris: Handbook for offline payments with CBDC (BIS Innovation Hub Project Report). <https://www.bis.org/publications/project-polaris-handbook-offline-payments-cbdc>

necessarily unique to CBDCs.<sup>34</sup> These features are therefore better understood as part of the case being tested for CBDC additionality, rather than as inherent advantages of CBDCs.

Wholesale experimentation has developed around a different set of motivations, increasingly linked to the settlement of tokenised financial activity; which is examined separately in Section 6. Notably, the CBDC debate has gradually moved away from technology alone. The relevant question is increasingly whether a CBDC solves a policy or settlement problem more effectively than the alternatives already available.

## 2.4 One concept, two increasingly different policy questions

The distinction between retail and wholesale CBDCs has become more pronounced as experimentation has matured.

For retail CBDCs, the central challenge is **additionality**. A new payment instrument must offer something that households, businesses, or governments cannot obtain as easily through bank transfers, cards, mobile payments, or instant-payment systems. This is a particularly high bar in mature payment markets. For instance, Australia has now twice concluded that its existing retail payment system does not create a clear public-interest case for a CBDC and Canada has scaled back dedicated retail CBDC work.<sup>35 36</sup>

Where existing payment systems leave clearer gaps, retail CBDCs may support inclusion, offline transactions, targeted public transfers, or access to central-bank money.<sup>37</sup> But even where the policy rationale is strong, adoption can depend on user trust and incentives, according to the IMF.<sup>38</sup> A CBDC competing with established networks of users, merchants, and financial institutions can run into the chicken-egg problem: the value of CBDC for consumers relies on the number of merchants accepting it, and conversely, the value for merchants depends on consumer usage.<sup>39</sup>

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<sup>34</sup>Hong Kong Monetary Authority. (2025, October). e-HKD Pilot Programme Phase 2 Report. [https://www.hkma.gov.hk/media/eng/doc/key-functions/financial-infrastructure/e-HKD\\_Pilot\\_Programme\\_Phase\\_2\\_Report.pdf](https://www.hkma.gov.hk/media/eng/doc/key-functions/financial-infrastructure/e-HKD_Pilot_Programme_Phase_2_Report.pdf)

<sup>35</sup>Reserve Bank of Australia. (2026, September 3). RITS consultation and retail CBDC update (Media Release No. 2026-24). <https://www.rba.gov.au/media-releases/2026/mr-26-24.html>

<sup>36</sup>Bank of Canada. (2026, September 24). Digital Canadian dollar. <https://www.bankofcanada.ca/digitaldollar/>

<sup>37</sup>Hong Kong Monetary Authority. (2025, October). e-HKD Pilot Programme Phase 2 Report. [https://www.hkma.gov.hk/media/eng/doc/key-functions/financial-infrastructure/e-HKD\\_Pilot\\_Programme\\_Phase\\_2\\_Report.pdf](https://www.hkma.gov.hk/media/eng/doc/key-functions/financial-infrastructure/e-HKD_Pilot_Programme_Phase_2_Report.pdf)

<sup>38</sup>Koonprasert, T., Kanada, T., Tsuda, S., & Reshidi, E. (2024). Central bank digital currency adoption: Inclusive strategies for intermediaries and users (FinTech Notes No. 2024/005). International Monetary Fund. <https://www.imf.org/-/media/files/publications/ftn063/2024/english/ftnea2024005.pdf>

<sup>39</sup>Ibid.

Wholesale CBDCs face a more specific institutional demand: tokenised markets are creating a clearer need for central-bank settlement that can interact with new infrastructure.<sup>40</sup> BIS' survey evidence corroborates this shift: wholesale CBDC exploration is now more advanced than retail exploration on aggregate, reversing the position recorded only a few years earlier.<sup>41</sup> That does not mean wholesale CBDCs have emerged as the default solution. Whether that requires a standalone wholesale CBDC, an upgraded link to existing reserves, or a combination of public and private settlement assets remains unsettled.

This distinction is important for how progress is assessed. Issuance is not the only meaningful outcome of CBDC research. A pilot can demonstrate a compelling use case, expose limits to adoption, or show that an existing system can achieve the same objective more efficiently. By 2026, the value of CBDC experimentation lies increasingly in distinguishing between these outcomes.

This report therefore assesses CBDC development against three different tests. For retail CBDCs, the relevant question is whether they can generate sustained use by providing capabilities that existing payment systems do not offer as effectively. For wholesale CBDCs, the question is whether central-bank money requires a new form or interface to support tokenised financial activity. For cross-border arrangements, the challenge is whether technically interoperable systems can also become legally, institutionally and operationally interoperable across sovereign jurisdictions. These are related questions, but they require different measures of progress.

### **3. The Global Picture: Exploration is widespread, issuance is not**

CBDC exploration has expanded rapidly over the past four years. The Atlantic Council's comparable global count increased from 87 jurisdictions in May 2022 to 146 countries and currency unions in May 2026.<sup>42</sup> Of these, 77 were classified as being in an advanced phase, i.e. development, pilot or launch, with 41 active pilots.<sup>43</sup> The reach of CBDC research is therefore no longer the main question; the more relevant focus is how much of that research has translated into broad public issuance.

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<sup>40</sup>Illes, A., Kosse, A., & Wierst, P. (2025, August 22). Advancing in tandem - results of the 2024 BIS survey on central bank digital currencies and crypto (BIS Papers No. 159). Bank for International Settlements. <https://www.bis.org/publications/paper-159-advancing-tandem-results-2024-bis-survey-central-bank-digital-currencies-and-crypto>

<sup>41</sup> Ibid.

<sup>42</sup> Atlantic Council. (2026, May). Central Bank Digital Currency Tracker. <https://www.atlanticcouncil.org/cbdctracker/>

<sup>43</sup> Ibid.

In its latest survey of 93 central banks, the BIS found that 91% were exploring a retail CBDC, wholesale CBDC or both, with wholesale work further advanced on aggregate.<sup>44</sup> Russia has made the clearest stride – the Digital Ruble entering phased public deployment on 1 September 2026.<sup>45</sup> At the same time, several jurisdictions that have spent years researching retail CBDCs – including Canada, Sweden and Australia – have stopped short of issuance because the additional public-policy case remains uncertain.

### 3.1 Regional deployment

#### 3.1.1 North America

North America has moved furthest away from retail issuance among the regions considered here: Canada has retained CBDC as a contingency, while US federal policy currently prohibits domestic CBDC development. Wholesale tokenisation research nevertheless continues in both jurisdictions through projects that do not amount to retail issuance.

- **United States — prohibited domestically; wholesale experimentation continues.** US prohibited federal actions to establish, issue, or promote a US CBDC through its January 2025 Executive Order and the subsequent statutory freeze in the 21st Century ROAD to Housing Act, which bans retail CBDCs through December 31, 2030.<sup>46,47</sup> This does not preclude research into wholesale tokenised settlement: the New York Innovation Center remains a participant in Project Agorá, which tests tokenised central-bank reserves and commercial-bank deposits for cross-border wholesale payments.<sup>48</sup>
- **Canada — research; retail CBDC deprioritised.** Despite conducting extensive retail-CBDC research,<sup>49</sup> the Bank of Canada (BoC) scaled down its dedicated retail digital dollar work following public consultations where 85% of respondents rejected the

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<sup>44</sup>Illes, A., Kosse, A., & Wierds, P. (2025, August 22). Advancing in tandem - results of the 2024 BIS survey on central bank digital currencies and crypto (BIS Papers No. 159). Bank for International Settlements.

<https://www.bis.org/publications/paper-159-advancing-tandem-results-2024-bis-survey-central-bank-digital-currencies-and-crypto>

<sup>45</sup>Bank of Russia. (2026, August 31). Digital ruble launched. <https://www.cbr.ru/eng/press/event/?id=32808>

<sup>46</sup>Exec. Order No. 14154, 3 C.F.R. (2025).

<https://www.whitehouse.gov/presidential-actions/2025/01/strengthening-american-leadership-in-digital-financial-technology/>

<sup>47</sup>Hamilton, J. (2026, June 22). U.S. Senate passes housing bill that carries four-year ban on a Fed CBDC. CoinDesk. <https://www.coindesk.com/policy/2026/06/22/u-s-senate-passes-housing-bill-that-carries-four-year-ban-on-a-fed-cbdc>

<sup>48</sup>Bank for International Settlements. (2026, May 27). Project Agorá shows how tokenisation can improve wholesale cross-border payments; work will advance to real-value testing [Media release]. <https://www.bis.org/media-releases/20260527-project-agora-shows-how-tokenisation-can-improve-wholesale-cross-border-payments-work-will>

<sup>49</sup>Darbha, S., Minwalla, C., Arora, R., & Shah, D. (2025, June). A retail CBDC design for basic payments: Feasibility study (Staff Discussion Paper No. 2025-9). Bank of Canada. [doi.org https://www.bankofcanada.ca/2025/06/staff-discussion-paper-2025-9/](https://www.bankofcanada.ca/2025/06/staff-discussion-paper-2025-9/)

concept over privacy fears.<sup>50</sup> No public retail pilot has occurred.<sup>51</sup> Meanwhile, domestic digital fiat innovation has shifted to the private sector, highlighted by the September 2026 commercial banking coalition exploring tokenised CAD deposits.<sup>52</sup>

### 3.1.2 Europe

Europe is pursuing both tracks but with member states demonstrating varying levels of commitment. Retail work is centred on preparedness and the digital euro, while Switzerland and France have pushed much further into wholesale settlement and tokenised financial markets.

- **EU — advanced preparation; retail pilot scheduled.** The digital euro has moved beyond conceptual design into operational preparation, though it has not been officially issued.<sup>53</sup> On July 14, 2026, the European Central Bank (ECB) selected 36 payment service providers for a 12-month beta pilot starting in the second half of 2027.<sup>54</sup> <sup>55</sup> A formal decision to issue remains conditional on legislation being finalised. To this end, the Digital Euro Regulation is currently in trilogue negotiations between the European Parliament, the Council of the European Union, and the European Commission.<sup>56</sup> The Eurosystem's current roadmap sets the baseline for technical readiness and potential first issuance in 2029.<sup>57</sup>

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<sup>50</sup>Central Banking Newsdesk. (2024, September 24). Bank of Canada pivots away from retail CBDC. Central Banking. <https://www.centralbanking.com/central-banks/payments/7962381/bank-of-canada-pivots-away-from-retail-cbdc>

<sup>51</sup>Central Banking Newsdesk. (2024, September 18). Bank of Canada pivots away from retail CBDC. Central Banking. [centralbanking.com](https://www.centralbanking.com)

<sup>52</sup>Scotiabank. (2026, September 22). Six Canadian banks explore development of a secure CAD tokenized deposit solution [Press release]. Cision PR Newswire. <https://www.newswire.ca/news-releases/six-canadian-banks-explore-development-of-a-secure-cad-tokenized-deposit-solution-807746405.html>

<sup>53</sup>European Central Bank. (2026). Progress on the digital euro. [https://www.ecb.europa.eu/euro/digital\\_euro/progress/html/index.en.html](https://www.ecb.europa.eu/euro/digital_euro/progress/html/index.en.html)

<sup>54</sup>European Central Bank. (2026, July 14). ECB selects 36 payment service providers to join digital euro pilot [Press release]. <https://www.ecb.europa.eu/press/pr/date/2026/html/ecb.pr260714~8cd07d9d45.en.html>

<sup>55</sup> The ECB has tested conditional payments but strictly distinguishes them from programmable money, ensuring currency usage is not restricted by design. According to the ECB, programmable money refers to “digital units with intrinsic spending logic” that restricts where, when, or to whom money can be transferred. This violates the legal tender requirement of universal acceptability and par fungibility with physical cash. In contrast, conditional payments preserve the money’s full fungibility. They only use smart contracts to execute standard, unrestricted payment instructions automatically upon predefined events (for instance, pay-on-delivery), preserving the money’s full fungibility.

([https://www.ecb.europa.eu/pub/pdf/legal/ecb.leg\\_con\\_2023\\_34.en.pdf](https://www.ecb.europa.eu/pub/pdf/legal/ecb.leg_con_2023_34.en.pdf))

<sup>56</sup>European Central Bank. (2026, August 17). FAQs on the digital euro. [https://www.ecb.europa.eu/euro/digital\\_euro/faqs/html/ecb.faq\\_digital\\_euro.en.html](https://www.ecb.europa.eu/euro/digital_euro/faqs/html/ecb.faq_digital_euro.en.html)

<sup>57</sup>European Central Bank. (2026). Digital euro pilot. [https://www.ecb.europa.eu/euro/digital\\_euro/pilot/html/index.en.html](https://www.ecb.europa.eu/euro/digital_euro/pilot/html/index.en.html)

- **United Kingdom — design/research; no issuance decision.** The Bank of England (BoE) and HM Treasury remain in the final stages of the digital-pound design phase.<sup>58</sup> While the Digital Pound Lab provides an experimental platform for industry and the Bank, no decision has been made to build or issue a digital pound.<sup>59</sup> The digital pound is being designed and assessed explicitly keeping in mind wider developments in UK retail payments.<sup>60</sup>
- **Sweden — technical pilot completed; legal preparedness continues.** The Riksbank completed its technical e-krona pilot in 2023 after testing a range of design questions, including integration, distribution and offline payments.<sup>61</sup> It currently sees no immediate case for issuance but has recommended preparatory legislative work so that an e-krona could be introduced within a reasonable period if future conditions create a stronger need.<sup>62</sup>
- **Switzerland — wholesale production-environment pilot; no retail programme.** The Swiss National Bank (SNB) currently sees no need for a retail CBDC in Switzerland and has instead concentrated its active CBDC experimentation on wholesale settlement.<sup>63</sup> Project Helvetia places wholesale CBDC on the SIX Digital Asset Platform while also comparing it with an RTGS-linked settlement model.<sup>64</sup> The pilot now runs until at least June 2028, without committing the SNB to permanent issuance.<sup>65</sup>
- **France — Advanced wholesale experimentation; retail deferred to Eurosystem.** As the Eurosystem participant in Project Agorá, the Banque de France continues a highly active, independent programme of wholesale CBDC experimentation that focuses on

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<sup>58</sup> Bank of England. (2026, June 23). Digital Pound Lab. <https://www.bankofengland.co.uk/the-digital-pound/lab>

<sup>59</sup> Bank of England. (2025, October 23). The digital pound. <https://www.bankofengland.co.uk/the-digital-pound>

<sup>60</sup> Bank of England. (2025, January 14). Progress update: The digital pound and the payments landscape. <https://www.bankofengland.co.uk/report/2025/digital-pound-progress-update>

<sup>61</sup> Sveriges Riksbank. (2026, June 29). E-krona. <https://www.riksbank.se/en-gb/payments--cash/e-krona/>

<sup>62</sup> Sveriges Riksbank. (2026, March 12). The Riksbank's recommendations. <https://www.riksbank.se/en-gb/payments--cash/payments-in-sweden/payments-report-2026/the-riksbanks-policy-recommendations/the-riksbanks-recommendations/>

<sup>63</sup> Central Banking Newsdesk. (2019, April 8). SNB rejects idea of retail central bank digital currency. Central Banking. <https://www.centralbanking.com/central-banks/currency/digital-currencies/3447396/snb-rejects-idea-of-retail-central-bank-digital-currency>

<sup>64</sup> Swiss National Bank. (2026). Project Helvetia. [https://www.snb.ch/en/the-snb/mandates-goals/payment-transactions/projekt\\_helvetia](https://www.snb.ch/en/the-snb/mandates-goals/payment-transactions/projekt_helvetia)

<sup>65</sup> Ibid.

optimising cross-border settlement and tokenised asset plumbing.<sup>66</sup> Its retail CBDC policy sits within the digital-euro project.<sup>67</sup>

### 3.1.3 Central Asia

Russia is one of the few large economies to have moved from pilot to live public rollout, while Kazakhstan is using CBDC infrastructure more selectively for programmable public spending and related use cases.

- **Russia — Live phased deployment; legal mandates active.** The Digital Ruble moved from pilot to public rollout on 1 September 2026.<sup>68</sup> Customers of major banks can now open digital-ruble accounts and transact through participating banking applications; transfers between individuals, business payments and government transactions are supported.<sup>69</sup> The rollout is deliberately staggered: major banks and retailers above the first revenue threshold entered in September 2026; additional banks and retailers follow in September 2027 and 2028.<sup>70</sup> Individual use remains voluntary.<sup>71</sup>
- **Kazakhstan — advanced implementation; preparing for full-scale production.** The Digital Tenge (DT) became legally recognised as a digital form of the national currency in 2026, while the platform remains in the process of transitioning from limited production and targeted use cases towards full-scale operation.<sup>72</sup> Earlier, the NBK had piloted “marked” DT to control the permitted use of public expenditure.<sup>73 74</sup>

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<sup>66</sup>Banque de France. (2026). Wholesale CBDC.

<https://www.banque-france.fr/en/financial-stability/financial-stability-mandate/supporting-digital-transformation-financial-sector/wholesale-mnbc>

<sup>67</sup>Banque de France. (2026). Challenges.

<https://www.banque-france.fr/en/financial-stability/financial-stability-mandate/supporting-digital-transformation-financial-sector/challenges>

<sup>68</sup>Bank of Russia. (2026, August 31). Digital ruble launched. <https://www.cbr.ru/eng/press/event/?id=32808>

<sup>69</sup>Bank of Russia. (2025, June). Digital ruble: Current status of the project [Цифровой рубль: Текущий статус проекта]. [https://www.cbr.ru/Content/Document/File/177415/digital\\_ruble\\_30062025.pdf](https://www.cbr.ru/Content/Document/File/177415/digital_ruble_30062025.pdf)

<sup>70</sup>Bank of Russia. (2025, July 15). Large-scale introduction of digital ruble to begin on 1 September 2026.

<https://cbr.ru/eng/press/event/?id=25774>

<sup>71</sup> Ibid.

<sup>72</sup>National Payment Corporation. (2025). Digital tenge: White paper 2025.

[https://npck.kz/wp-content/uploads/2026/03/DT\\_WP\\_2025\\_ENG\\_FINAL-1.pdf](https://npck.kz/wp-content/uploads/2026/03/DT_WP_2025_ENG_FINAL-1.pdf)

<sup>73</sup>National Bank of Kazakhstan. (2024, July 18). A pilot project has been launched to implement Digital Tenge for marking public expenditures. <https://nationalbank.kz/en/news/informacionnye-soobshcheniya/16879>

<sup>74</sup>International Monetary Fund. (2026). IMF Technical Assistance Report (Report No. TAR/2026/002).

<https://www.imf.org/-/media/files/publications/tar/2026/english/tarea2026002-source-pdf.pdf>

### 3.1.4 Asia-Pacific

Asia-Pacific has the widest range of models. China and India continue large retail experiments; Japan continues pursuing preparedness; Hong Kong and South Korea increasingly combine CBDC infrastructure with tokenised bank money; and Singapore and Thailand remain more focused on wholesale and cross-border settlement.

- **China — large-scale retail experiment; cross-border and deposit-like features expanding.** The e-CNY remains the world's largest retail CBDC experiment by absolute scale, having processed 3.48 billion cumulative transactions worth CNY 16.7 trillion by late 2025.<sup>75</sup> Its ecosystem features cross-border links with Hong Kong's Faster Payment System and dominates 95% of transaction volumes on the multi-CBDC mBridge ledger.<sup>76</sup> From January 2026, balances held through authorised commercial-bank wallets can earn interest, receive deposit-insurance protection and be incorporated into banks' reserve-requirement framework, moving part of the model closer to deposit money.<sup>77</sup>
- **Hong Kong SAR — retail pilot completed; wholesale tokenised settlement prioritised.** Following the conclusion of its e-HKD Phase 2 retail trials in October 2025, the Hong Kong Monetary Authority (HKMA) explicitly shifted priorities from everyday consumer tokens toward wholesale institutional plumbing.<sup>78</sup> This culminated in Project Ensemble and its interbank operational rail, EnsembleTX.<sup>79</sup> During 2026, HKMA is progressively enhancing the EnsembleTX pilot environment to support, among other capabilities, settlement in tokenised central-bank money on a 24/7 basis.<sup>80</sup> Retail e-HKD functionality remains preserved for readiness in case of future expansion.<sup>81</sup>

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<sup>75</sup>He, A. (2026, July). China's Central Bank Digital Currency 2.0 and the future of digital finance (CIGI Papers No. 358). Centre for International Governance Innovation.

[https://www.cigionline.org/static/documents/Paper\\_No\\_hY016rp.358\\_He.pdf](https://www.cigionline.org/static/documents/Paper_No_hY016rp.358_He.pdf)

<sup>76</sup> Ibid.

<sup>77</sup> Ibid.

<sup>78</sup>Hong Kong Monetary Authority. (2025, October 28). HKMA completes e-HKD Pilot Programme and outlines future direction of e-HKD [Press release].

<https://www.hkma.gov.hk/eng/news-and-media/press-releases/2025/10/20251028-4/>

<sup>79</sup>Hong Kong Monetary Authority. (2025, November 13). HKMA announces the new phase of Project Ensemble to support real-value transactions in tokenised deposits and digital assets [Press release].

<https://www.hkma.gov.hk/eng/news-and-media/press-releases/2025/11/20251113-3/>

<sup>80</sup>The Government of the Hong Kong Special Administrative Region. (2026, September 16). Full text of the Chief Executive's 2026 Policy Address (2) [Press release].

<https://www.info.gov.hk/gia/general/202609/16/P2026091600244.htm>

<sup>81</sup>Hong Kong Monetary Authority. (2025, October 28). HKMA completes e-HKD Pilot Programme and outlines future direction of e-HKD [Press release].

<https://www.hkma.gov.hk/eng/news-and-media/press-releases/2025/10/20251028-4/>

- **India — active retail/wholesale pilots; focus on welfare and tokenisation.** As of September 2026, the Reserve Bank of India continues to run parallel, controlled pilots for both e₹-Retail and e₹-Wholesale.<sup>82</sup> The retail pilot has scaled past 12 million users and 175 million transactions, testing offline capabilities, merchant cash-like interoperability, and programmable welfare distribution across multiple states.<sup>83</sup> Concurrently, wholesale operations expanded past basic government securities into asset tokenisation, piloting tokenized Certificates of Deposit via the Unified Markets Interface (UMI), and recently launched tokenised corporate bonds.<sup>84</sup> While a nation-wide rollout is yet to be formally announced, the RBI is actively expanding the pilots to encourage adoption and usage.<sup>85</sup>
- **Japan — advanced technical pilot; no issuance mandate.** The Bank of Japan (BOJ) conducts technical testing and performance experiments within its CBDC Pilot Program System, leveraging its CBDC Forum to discuss and collaborate with private businesses.<sup>86</sup> Its September 11, 2026 pilot progress report focused on system performance testing, desktop analysis of credit transfers, ledger consistency, and API sandbox experiments. This follows the announcement of a sandbox project to experiment settlements and bank deposits using central bank money.<sup>87</sup> The BOJ explicitly states that its CBDC work remains in an experimental stage and that any decision on whether to formally issue a CBDC in Japan will be made through public discussions.<sup>88</sup>
- **South Korea — real-world scaling of Project Hangang's deposit token model.** The BOK successfully completed Phase I of its Hangang digital currency pilot in June 2025 and plans to progressively strengthen the infrastructure for commercial deployment and adoption of tokenised deposits.<sup>89</sup> The BOK also plans to conduct pilots in

<sup>82</sup> Reserve Bank of India. (2026, August 7). Edited transcript of the Reserve Bank of India's post-monetary policy press conference: August 5, 2026 (Wednesday) [Press transcript]. [https://rbi.org.in/scripts/BS\\_SpeechesView.aspx?Id=1566](https://rbi.org.in/scripts/BS_SpeechesView.aspx?Id=1566)

<sup>83</sup> Kapoor, S. (2026, July 1). India pushing rupee internationalisation through local currency pacts: RBI Governor. CNBC TV18.

<https://www.cnbctv18.com/economy/india-pushing-rupee-internationalisation-through-local-currency-pacts-rbi-governor-19936799.htm>

<sup>84</sup> Reserve Bank of India. (2026, September 10). Shaping the next decade of finance – Technology, trust and innovation [Keynote address] [https://rbi.org.in/scripts/BS\\_SpeechesView.aspx?Id=1578](https://rbi.org.in/scripts/BS_SpeechesView.aspx?Id=1578)

<sup>85</sup> Reserve Bank of India. (2026, August 7). Edited transcript of the Reserve Bank of India's post-monetary policy press conference: August 5, 2026 (Wednesday) [Press transcript]. [https://rbi.org.in/scripts/BS\\_SpeechesView.aspx?Id=1566](https://rbi.org.in/scripts/BS_SpeechesView.aspx?Id=1566)

<sup>86</sup> Bank of Japan. (2026, June). Central bank digital currency experiments: Progress report on the pilot program (June 2026) (Report by Payment and Settlement Systems Department). <https://www.boj.or.jp/en/paym/digital/dig260911a.pdf>

<sup>87</sup> Bank of Japan. (2026, March 3). The future architecture of payment systems: Technology and central bank money [Speech transcript]. [https://www.boj.or.jp/en/about/press/koen\\_2026/data/ko260303a.pdf](https://www.boj.or.jp/en/about/press/koen_2026/data/ko260303a.pdf)

<sup>88</sup> Ibid.

<sup>89</sup> Bank of Korea. (2026, September 17). Payment and Settlement Systems Report 2025 (Annual Report).

<https://www.bok.or.kr/eng/bbs/E0000866/view.do?nttId=11064840&oldMenuNo=400007&menuNo=400223&programType=newsDataEng&depth=400223&relate=Y>

collaboration with relevant government ministries and agencies to explore potential public sector applications, including the disbursement of public funds.<sup>90</sup>

- **Singapore — wholesale-focused multi-currency infrastructure.** Singapore's CBDC work has centred on institutional settlement rather than a general-purpose retail currency. Project Ubin tested DLT-based interbank settlement, Jasper-Ubin tested cross-border links with Canada, and Singapore later participated in Project Dunbar's multi-CBDC settlement platform. The furthest stage is advanced wholesale experimentation. In 2025, the Monetary Authority of Singapore (MAS) concluded its live trial for settlement of interbank overnight lending transactions using wholesale CBDC on the Singapore Dollar Test Network.<sup>91</sup> MAS plans to build on this pilot and issue tokenised MAS Bills to Primary Dealers which will be settled using wholesale CBDC, with details expected sometime in 2026.<sup>92</sup>
- **Thailand — wholesale mBridge emphasis; retail testing deprioritised.** While the Bank of Thailand maintains a static testbed for retail functionality, its resources are allocated primarily to Project mBridge.<sup>93</sup> It pursues these efforts under the Inthanon Project's banner. Earlier projects like Project Bang Khun Phrom piloted CBDC use to assess the effectiveness and safety without affecting the overall financial stability of the Thailand financial system, starting from 2022 to the third quarter of 2023.<sup>94</sup> No nationwide Thai retail-CBDC launch has been announced.<sup>95</sup>
- **Indonesia — phased development.** Bank Indonesia is continuing its multi-phase Project Garuda.<sup>96</sup> Current development footprint is locked to the initial wholesale phase and the Bank Indonesia has successfully completed the Proof of Concept (PoC) for the

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<sup>90</sup> Ibid.

<sup>91</sup> Monetary Authority of Singapore. (2025). MAS announces successful live trial of settlement of interbank overnight lending [Press release].

<https://www.mas.gov.sg/news/media-releases/2025/mas-announces-successful-live-trial-of-settlement-of-interbank-overnight-lending>

<sup>92</sup> Ibid.

<sup>93</sup> Bank of Thailand. (2023). Thailand's progress and development of CBDC.

<https://www.bot.or.th/en/financial-innovation/digital-finance/central-bank-digital-currency/Whatarethebenefits/developmentofcbdc.html>

<sup>94</sup> Bank of Thailand. (2023). Project Bang Khun Phrom.

<https://www.bot.or.th/en/financial-innovation/digital-finance/central-bank-digital-currency/Whatarethebenefits/projectbangkhunphromen.html>

<sup>95</sup> Ibid.

<sup>96</sup> Bank Indonesia. (2023). The Project Garuda: Navigating the Digital Rupiah architecture. In Economic Report on Indonesia 2022 (pp. 131–142).

[https://www.bi.go.id/en/publikasi/laporan/Documents/8\\_LPI2022\\_EN\\_CHAPTER\\_7.pdf](https://www.bi.go.id/en/publikasi/laporan/Documents/8_LPI2022_EN_CHAPTER_7.pdf)

“immediate state” of Rupiah Digital exploration.<sup>97</sup> As next steps, Project Garuda will proceed with a broader exploration of a wholesale securities ledger, Liquidity Saving Mechanisms and privacy technologies.<sup>98</sup>

### 3.1.5 Latin America & Caribbean

Latin America demonstrates substantial experimentation but no common trajectory. Brazil has moved furthest towards a tokenised financial-market architecture, while most other large economies remain in research or proof-of-concept stages. Though the Caribbean has pioneered cases of full retail deployments, it has moved away from uniform regional expansion following severe structural pullbacks and bottlenecks.

- **Brazil — wholesale CBDC pilot, incremental approach.** Through its ongoing multi-phase pilot, the Banco Central do Brasil (BCB) is evaluating Drex for institutional use cases, including encumbrance reconciliation, credit collateralisation, and interbank settlement.<sup>99</sup> Phase 2 of the Drex pilot has concluded and the report is currently under construction.<sup>100</sup> Rather than committing to widespread DLT adoption or full-scale CBDC implementation, Brazil’s current approach seeks incremental improvements that leverage established financial market infrastructures.<sup>101</sup>
- **Mexico — retail shelved; active participant in Project Agorá wholesale trials.** Banco de México (Banxico) maintains no active public retail pilot.<sup>102</sup> Instead, Mexico redirected its institutional capital into sovereign cross-border rails and operates as one of the seven foundational central banks anchoring the BIS-led Project Agorá.<sup>103 104</sup>
- **Chile — advanced feasibility research; evaluating necessity against high digitisation.** The Banco Central de Chile (BCCH) has stated that there is no pressing need to issue a

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<sup>97</sup>Bank Indonesia. (2024, December). Project Garuda: Wholesale Rupiah Digital Proof of Concept (PoC) report – Cash Ledger. [https://www.bi.go.id/en/rupiah/digital-rupiah/Documents/Laporan\\_POC\\_Proyek\\_Garuda\\_EN.pdf](https://www.bi.go.id/en/rupiah/digital-rupiah/Documents/Laporan_POC_Proyek_Garuda_EN.pdf)

<sup>98</sup> Ibid.

<sup>99</sup>Bizama, G. (2026). Fast payment systems and central bank digital currencies: Evidence from Pix and the Drex in Brazil. *Latin American Journal of Central Banking*, 100206. <https://doi.org/10.1016/j.latcb.2026.100206>

<sup>100</sup>Banco Central do Brasil. (n.d.). Piloto Drex. <https://www.bcb.gov.br/estabilidadefinanceira/piloto-drex>

<sup>101</sup> Gomes, R. D. D. B. (2025, May 29). Emerging technologies, lessons from Pix and Drex, and future perspectives [Speech transcript]. Bank for International Settlements. <https://www.bis.org/speeches/20250529-emerging-technologies-lessons-pix-and-drex-and-future-perspectives>

<sup>102</sup>CBDC Registry. (2026, July 3). Mexico MDBC (Moneda Digital del Banco Central). <https://cbdcregistry.org/cbdc/mexico-cbdc/>

<sup>103</sup>Human Rights Foundation. (2026). Mexico CBDC Tracker. CBDC Tracker <https://cbdctracker.hrf.org/currency/mexico>

<sup>104</sup> Ibid.

retail CBDC, but continued practical testing to ensure preparedness.<sup>105</sup> The central bank is focussing on a proof of concept for wholesale CBDC and plans to simulate the transfer of tokenised assets between agents on a blockchain ledger, using a wholesale CBDC as the settlement instrument.<sup>106</sup>

- **The Bahamas — first global retail launch; facing flat public adoption.** The Bahamas remains a global pioneer, having executed the world's first nationwide launch of the Sand Dollar in October 2020.<sup>107</sup> Despite complete operational deployment to counter the decline of physical bank branches, organic user traction remains notably low.<sup>108</sup>
- **Jamaica — fully deployed retail JAM-DEX; bottlenecked by merchant infrastructure.** Following its formal launch in July 2022, the Bank of Jamaica's (BOJ) retail CBDC, JAM-DEX, continues to struggle with active public usage.<sup>109</sup> The Ministry of Finance and the BOJ recently announced measures to ease consumer bottlenecks and enhance the rollout.<sup>110</sup> JAM-DEX does not participate in international or multilateral wholesale CBDC projects.<sup>111</sup>

### 3.1.6 Africa

- **Nigeria — retail eNaira remains operational; policy focus is broadening.** The Central Bank of Nigeria's (CBN) eNaira launched in 2021 as Africa's pioneer retail CBDC.<sup>112</sup> Following limited consumer adoption, recent CBN policy places greater emphasis on interoperability, financial inclusion and cross-border CBDC use cases alongside the

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<sup>105</sup>Costa, R. (2024, May 30). Central bank's agenda for payment systems: Recent developments and challenges [Presentation transcript]. Banco Central de Chile.  
<https://www.bcentral.cl/documents/33528/133214/rcc-30052024.pdf/827cb7a9-16f7-3b56-bad9-f6250222b149?t=1717105895090>

<sup>106</sup>Costa, R. (2025, September 16). Chilean economy and digital payments: Progress and challenges [Speech transcript]. Bank for International Settlements.  
<https://www.bis.org/speeches/20250929-chilean-economy-and-digital-payments-progress-and-challenges.pdf>

<sup>107</sup>Dionysopoulos, L., Marra, M., & Urquhart, A. (2024). Central bank digital currencies: A critical review. *International Review of Financial Analysis*, 91, Article 103031 [7]. doi.org [7]  
(<https://www.sciencedirect.com/science/article/pii/S1057521923005471#bb44>)

<sup>108</sup>Koonprasert, T., Kanada, T., Tsuda, S., & Reshidi, E. (2024). Central bank digital currency adoption: Inclusive strategies for intermediaries and users (FinTech Notes No. 2024/005). International Monetary Fund.  
<https://www.imf.org/-/media/files/publications/ftn063/2024/english/ftnea2024005.pdf>

<sup>109</sup>Ibid.

<sup>110</sup>Patterson, C. (2025, August 26). BOJ anticipates digital currency expansion will ease ATM challenges. Jamaica Information Service. <https://jis.gov.jm/boj-anticipates-digital-currency-expansion-will-ease-atm-challenges/>

<sup>111</sup>Raizada, S. (2026, August 10). CBDC projects around the world: Countries leading digital currency pilots. Blockchain Council.  
<https://www.blockchain-council.org/digital-assets/cbdc-projects-around-the-world-digital-currency-pilots/>

<sup>112</sup>International Monetary Fund. (2021, November 15). Five observations on Nigeria's central bank digital currency.  
<https://www.imf.org/en/news/articles/2021/11/15/na111621-five-observations-on-nigerias-central-bank-digital-currency>

existing retail eNaira.<sup>113</sup> The CBN announced its plan to officially repurpose it as an underlying public sector infrastructure while continuing to drive non-local use cases for efficient cross-border transfers.<sup>114</sup>

- **South Africa — Retail implementation rejected, focus on wholesale.** After several years of research and technical experimentation, the SARB concluded that a retail CBDC is feasible but that there is no compelling immediate need to introduce one.<sup>115</sup> Its priority has shifted towards modernising the existing payment system and exploring wholesale CBDC applications.<sup>116</sup>

### 3.1.7 Middle East

Middle Eastern CBDC work is predominantly cross-border and wholesale-oriented. The UAE has the broadest programme, while Saudi Arabia and other Gulf jurisdictions have concentrated more heavily on bank-to-bank and multi-currency settlement.

- **United Arab Emirates — advanced multi-track pilot; core mBridge participant.** The Digital Dirham programme covers domestic retail applications, institutional wholesale banking, and cross-border settlement architectures.<sup>117</sup> The currency is legally designated as domestic legal tender.<sup>118</sup> The Central Bank of the UAE (CBUAE) has successfully integrated early live government transactions into its pilot framework, though full open public availability remains restricted due to a phased nationwide rollout.<sup>119</sup> UAE also remains an active core hub on the multi-CBDC mBridge platform.<sup>120</sup>
- **Saudi Arabia — wholesale research baseline; formally exited active mBridge participation.** The Saudi Central Bank (SAMA) restricts its sovereign digital currency footprint strictly to wholesale and institutional research, maintaining no domestic retail

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<sup>113</sup>Central Bank of Nigeria. (2026). Nigeria payments system vision 2028 (Policy Document).

<https://www.cbn.gov.ng/Out/2026/CCD/Nigeria%20Payments%20System%20Vision%202028.pdf>

<sup>114</sup>Ibid.

<sup>115</sup>South African Reserve Bank. (2025, November). SARB position paper on the necessity of a retail CBDC in South Africa.

[https://www.resbank.co.za/content/dam/sarb/publications/fintech/SARB%20retail%20CBDC%20Position%20Paper\\_Financial%20November%2020251125.pdf](https://www.resbank.co.za/content/dam/sarb/publications/fintech/SARB%20retail%20CBDC%20Position%20Paper_Financial%20November%2020251125.pdf)

<sup>116</sup>Ibid.

<sup>117</sup>Jobst, A. A., & Timonen, J. (2025, July). Digital Dirham – Selected issues and policy considerations (CBUAE Working Paper No. 1/2025). Central Bank of the UAE.

[https://centralbank.ae/media/qw1ex32h/cbdc-long-report\\_july.pdf](https://centralbank.ae/media/qw1ex32h/cbdc-long-report_july.pdf)

<sup>118</sup>Ibid.

<sup>119</sup>Central Bank of the UAE. (2025, July). Digital Dirham - A primer on the UAE's central bank digital currency (Policy Paper No. 1/2025). [https://centralbank.ae/media/lczb23l4/cbdc-short-report\\_july.pdf](https://centralbank.ae/media/lczb23l4/cbdc-short-report_july.pdf)

<sup>120</sup>Central Bank of the UAE. (2026). Project mBridge.

<https://centralbank.ae/en/our-operations/fintech-digital-transformation/mbridge/>

issuance mandate.<sup>121</sup> SAMA briefly elevated its posture by joining the mBridge platform in 2024, but has officially confirmed that it is no longer a participating member.<sup>122</sup>

- **Israel — advanced multipurpose design.** The BOI's formalised architecture outlines a multipurpose digital shekel (mCBDC), integrating a retail tier for public use with an underlying wholesale settlement layer for financial institutions.<sup>123</sup> While a live nationwide launch has not been deployed, project leadership confirmed that definitive policy recommendations will be delivered by the end of 2026.<sup>124</sup>
- **Qatar — wholesale infrastructure experimentation; targeted interbank tokenisation pilots active.** The QCB successfully finalised the development of its core CBDC infrastructure to deploy a specialised wholesale architecture.<sup>125</sup> QCB's focus remains boosting domestic settlement speeds, expanding capital market access, and testing atomic delivery-versus-payment (DvP) mechanisms for digital government securities.<sup>126</sup>

### 3.1.8 Australia

Australia is one of the clearest examples of retail and wholesale CBDC policy diverging: the retail case is currently weak, while the institutional case for experimenting with new forms of settlement remains active.

- **Australia — retail CBDC deprioritised; wholesale asset tokenisation advanced.** The Reserve Bank of Australia (RBA) and the Treasury formally reaffirmed in September 2026 that there is no current public-interest case for issuing a consumer-facing retail

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<sup>121</sup>Saudi Central Bank. (2023, January 23). Saudi Central Bank continues CBDC experimentations.

<https://sama.gov.sa/en-US/MediaCenter/News/pages/news-812.aspx>

<sup>122</sup>Moneycontrol News. (2026, September 20). Saudi Arabia exits China-led mBridge digital currency platform: What it means for dollar dominance.

<https://www.moneycontrol.com/world/saudi-arabia-exits-china-led-mbridge-digital-currency-platform-what-it-means-for-dollar-dominance-article-14033780.html>

<sup>123</sup>Bank of Israel. (2026, May 13). The Bank of Israel publishes a 2025 progress report on the Digital Shekel Project [Press release].

<https://www.boi.org.il/en/communication-and-publications/press-releases/the-bank-of-israel-publishes-a-2025-progress-report-on-the-digital-shekel-project/>

<sup>124</sup>Knight, O. (2025, December 1). Israel's central bank signals improved stablecoin oversight as digital shekel plans advance. CoinDesk.

<https://www.coindesk.com/business/2025/12/01/israel-s-central-bank-signals-improved-stablecoin-oversight-as-digital-shekel-plans-advance>

<sup>125</sup>Qatar Central Bank. (n.d.). Central bank digital currency (CBDC) <https://cbdctracker.hrf.org/currency/qatar>

<sup>126</sup>Qatar Central Bank. (n.d.). Central bank digital currency (CBDC).

<https://www.qcb.gov.qa/en/FinancialInstrumentsAndPaymentSystems/pages/digital-currency.aspx>

CBDC, concluding that the domestic payment ecosystem satisfies public needs.<sup>127</sup> Efforts have shifted entirely to institutional plumbing via Project Acacia, which successfully tested tokenised-market use cases spanning fixed income and trade receivables.<sup>128</sup>

#### 4. Cross-Border CBDCs and the Interoperability Experiment

Cross-border projects have been central to CBDC experimentation because they test a different proposition from domestic retail issuance: whether new forms of central-bank settlement can shorten the chain of intermediaries involved in international transactions.<sup>129</sup> Early experiments therefore focused on changing how central-bank money moves between jurisdictions: linking domestic settlement systems, allowing financial institutions to transact directly in multiple currencies, or bringing several central-bank currencies onto a common platform.

While the experiments have established that these approaches are technically possible, they have shifted focus to whether a new settlement architecture can accomplish speed and scale while preserving central-bank control over national currencies, providing sufficient foreign-exchange liquidity, complying with different legal and regulatory regimes, protecting transaction data and creating governance arrangements acceptable to every jurisdiction involved.

This is why cross-border CBDC experimentation has developed along several architectural paths.<sup>130</sup> One approach seeks **compatibility**, using common standards so that separate domestic systems can communicate more easily.<sup>131</sup> The second **interlinks** separate systems through technical interfaces while allowing each jurisdiction to retain its own infrastructure.<sup>132</sup> The most integrated model places multiple currencies on a **common multi-CBDC platform** with shared infrastructure and governance.<sup>133</sup> In this context, integration refers to the accommodation of multiple national currencies into a single, unified system rather than keeping them in separate, isolated systems that merely talk to one another. The distinction matters because greater

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<sup>127</sup>Reserve Bank of Australia & Australian Treasury. (2026, September). Retail Central Bank Digital Currency in the Australian context: An update [Position paper].

<https://www.rba.gov.au/payments-and-infrastructure/tokenised-money/pdf/retail-cbdc-position-paper-sep-2026.pdf>

<sup>128</sup>Reserve Bank of Australia. (2026). Project Acacia.

<https://www.rba.gov.au/payments-and-infrastructure/tokenised-money/project-acacia/>

<sup>129</sup>Committee on Payments and Market Infrastructures, Bank for International Settlements Innovation Hub, International Monetary Fund, & World Bank. (2021, July). Central bank digital currencies for cross-border payments: Report to the G20 [Report]. Bank for International Settlements.

<https://www.bis.org/publications/central-bank-digital-currencies-cross-border-payments.pdf>

<sup>130</sup>Ibid.

<sup>131</sup>Ibid.

<sup>132</sup>Ibid.

<sup>133</sup>Ibid.

integration can remove more intermediaries, but it also requires central banks to share more infrastructure, rules and decision-making.<sup>134</sup>

Multilateral evidence also points decisively toward a focus on cross-border interoperability rather than monetary unification, preserving national currencies, domestic monetary authority, and separate issuance decisions.<sup>135</sup>

#### **4.1 First generation experiments proved that different systems could transact**

In 2019, Project Jasper-Ubin connected experimental Canadian and Singaporean wholesale payment networks built on different DLT platforms.<sup>136</sup> It demonstrated that tokenised central-bank settlement assets on technologically different networks could be exchanged without requiring the two domestic platforms to become identical.<sup>137</sup> Project Aber between Saudi Arabia and the UAE explored a more integrated bilateral model: it created a wholesale digital settlement asset for participating commercial banks and tested its use for both domestic and cross-border transactions.<sup>138</sup> The project showed that DLT-based central-bank money could support interbank settlement across the two jurisdictions, while also giving the central banks practical experience with issuance, governance and operational design.<sup>139</sup>

Hong Kong and Thailand then moved the model closer to a multi-currency cross-border platform through Project Inthanon-LionRock, which would later become Project mBridge in its third phase.<sup>140</sup> Inthanon-LionRock's second phase tested foreign-exchange matching, transaction privacy, monitoring and regulatory compliance alongside settlement.<sup>141</sup> The project demonstrated that a shared wholesale CBDC platform could compress payment and FX settlement into a much shorter process.<sup>142</sup> Other projects pushed the question beyond payments

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<sup>134</sup> Ibid.

<sup>135</sup> Auer, R., Haene, P., & Holden, H. (2021, March). Multi-CBDC arrangements and the future of cross-border payments (BIS Papers No. 115). Bank for International Settlements.

<https://www.bis.org/publications/paper-115-multi-cbdc-arrangements-and-future-cross-border-payments.pdf>

<sup>136</sup> Monetary Authority of Singapore, & Bank of Canada. (2019, May 2). Central banks of Canada and Singapore conduct successful experiment for cross-border payments [Press release].

<https://www.mas.gov.sg/news/media-releases/2019/central-banks-of-canada-and-singapore-conduct-successful-experiment-for-cross-border-payments>

<sup>137</sup> Ibid.

<sup>138</sup> Saudi Press Agency. (2020, November 29). SAMA and CBUAE issue report on results of joint digital currency project "Aber" <https://www.spa.gov.sa/2162519>

<sup>139</sup> Ibid.

<sup>140</sup> BIS Innovation Hub, Hong Kong Monetary Authority, Bank of Thailand, Digital Currency Institute of the People's Bank of China, & Central Bank of the United Arab Emirates. (2022, October). Project mBridge: Connecting economies through CBDC [Report]. Bank for International Settlements.

<https://centralbank.ae/media/Inchuury/project-mbridge-connecting-economies-through-cbdc-final.pdf>

<sup>141</sup> Ibid.

<sup>142</sup> Ibid.

alone. Project Jura, involving the Banque de France, Swiss National Bank and BIS Innovation Hub, settled euro and Swiss franc wholesale central-bank money alongside tokenised securities in a near-real environment.<sup>143</sup> It demonstrated both payment-versus-payment (PvP) for foreign exchange and DvP, in which the transfer of an asset is conditional on the corresponding payment.<sup>144</sup>

Project Dunbar made the governance problem explicit.<sup>145</sup> Australia, Malaysia, Singapore and South Africa tested a common platform on which participating banks could transact directly in multiple CBDCs.<sup>146</sup> The technology worked, but the project identified three central questions around any shared international infrastructure: who should have access; which jurisdiction's rules apply to different parts of a transaction; and how several central banks can govern common infrastructure without surrendering control over their own currencies, data and regulatory responsibilities.<sup>147</sup>

By the end of this first generation, the basic technical proposition was therefore largely established. Different CBDCs could be linked; multiple currencies could coexist on a shared platform; FX transactions could settle atomically; and tokenised securities could be exchanged against central-bank money. The experiments had moved the debate away from whether cross-border CBDC settlement was technically possible and towards the institutional conditions under which it could become usable infrastructure.

#### **4.2 mBridge took the common-platform model further**

Project mBridge grew directly out of Inthanon-LionRock.<sup>148</sup> Hong Kong and Thailand were joined by the Digital Currency Institute of the People's Bank of China and the Central Bank of the United Arab Emirates, with the BIS Innovation Hub supporting the development of a common multi-CBDC platform.<sup>149</sup> Rather than connecting independent domestic ledgers, the project developed the mBridge Ledger, on which participating central banks could issue their

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<sup>143</sup>Bank for International Settlements. (2021, December 8). Project Jura. <https://www.bis.org/project/jura>

<sup>144</sup> Ibid.

<sup>145</sup>Bank for International Settlements Innovation Hub, Reserve Bank of Australia, Bank Negara Malaysia, Monetary Authority of Singapore, & South African Reserve Bank. (2022, March). Project Dunbar: International settlements using multi-CBDCs [Report]. Bank for International Settlements. <https://www.rba.gov.au/payments-and-infrastructure/tokenised-money/pdf/project-dunbar-report-2022-03.pdf>

<sup>146</sup> Ibid.

<sup>147</sup> Ibid.

<sup>148</sup>Bank for International Settlements Innovation Hub et al. (2022, October). Project mBridge: Connecting economies through CBDC. Central Bank of the UAE <https://centralbank.ae/media/Inchuury/project-mbridge-connecting-economies-through-cbdc-final.pdf>

<sup>149</sup> Ibid.

own wholesale CBDCs and commercial banks could conduct cross-border payments and FX transactions directly.<sup>150</sup>

mBridge reached minimum viable product status in mid-2024.<sup>151</sup> In tandem, the project had also developed a bespoke legal and governance framework and a rulebook intended to accommodate the decentralised structure of a platform operated by several central banks.<sup>152</sup> The governance transition became more concrete in October 2024, when the BIS Innovation Hub announced that it was stepping away from mBridge and handing the project over to its participating central banks after it reached the MVP stage.<sup>153</sup> Notably, Saudi Arabia also exited the project in 2025. The handover shifted responsibility for the platform's further development and governance more directly onto the central banks themselves, making the institutional arrangements underpinning a shared multi-CBDC platform increasingly consequential.<sup>154</sup>

Atlantic Council data reported that Project mBridge transaction volumes had surged to \$55.49 billion, a 2,500-fold increase over early-2022 pilots, with the e-CNY making up over 95 percent of total settlement volume.<sup>155</sup> A relatively small number of high-value transactions can generate a large cumulative value, while the concentration of activity in one currency may indicate that participation and liquidity remain uneven.<sup>156</sup> Therefore, while transaction values may be presented as evidence of operational progression, they require careful interpretation.

mBridge nevertheless represents the most developed version of one particular cross-border CBDC proposition: several central banks issue digital settlement assets on shared infrastructure, participating banks transact directly, and FX and payment settlement occur within the same environment. Its remaining questions are increasingly institutional rather than purely technical.<sup>157</sup> Expanding the platform requires agreement over foreign access, currency controls,

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<sup>150</sup> Ibid.

<sup>151</sup> Bank for International Settlements. (n.d.). Project mBridge: Connecting economies through CBDC.

<https://www.bis.org/project/mbridge>

<sup>152</sup> Ibid.

<sup>153</sup> Jones, H. (2024, October 31). BIS to leave cross-border payments platform Project mBridge. Reuters.

<https://www.reuters.com/business/finance/bis-leave-cross-border-payments-platform-project-mbridge-2024-10-31/>

<sup>154</sup> Digital Pound Foundation. (2024, November 6). BIS departure from mBridge: A strategic exit or a political move? <https://digitalpoundfoundation.com/bis-departure-from-mbridge-a-strategic-exit-or-a-political-move/>

<sup>155</sup> Chhangani, A. (2026, January 15). What to watch as China prepares its digital yuan for prime time. Atlantic Council.

<https://www.atlanticcouncil.org/blogs/econographics/what-to-watch-as-china-prepares-its-digital-yuan-for-prime-time/>

<sup>156</sup> Bank for International Settlements Innovation Hub et al. (2022, October). Project mBridge: Connecting economies through CBDC. Central Bank of the UAE.

<https://www.bis.org/publications/project-mbridge-connecting-economies-through-cbdc.pdf>

<sup>157</sup> Ibid.

liquidity provision, data, regulatory responsibility, dispute resolution and governance, precisely the issues earlier projects identified at smaller scale.

#### 4.3 Agorá redesigned correspondent banking rather than simply removing it

Project Agorá approaches the same problem from a different direction: it asks whether the existing two-tier monetary system can be represented on programmable infrastructure rather than replaced by a platform consisting only of CBDCs.<sup>158</sup> Agorá combines tokenised commercial-bank deposits with tokenised central-bank reserves.<sup>159</sup> Its prototype uses a unifying ledger for commercial-bank deposits and separate jurisdictional ledgers for central-bank reserves, with the layers coordinated so that the different legs of a cross-border payment can settle atomically.<sup>160</sup>

Rather than mandating all countries onto one database, Agorá keeps central bank money under strict domestic control.<sup>161</sup> When an international transfer happens, commercial bank tokens interact on the shared unifying ledger using smart contracts to execute compliance and workflow rules, but the actual central bank reserves never leave their respective domestic sovereign networks. This essentially preserves the existing division of roles between central banks and commercial banks while changing the infrastructure underneath it. In this sense, it is as much an experiment in the future of correspondent banking as it is an experiment in CBDC.

The prototype reported in May 2026 showed that tokenised deposits and tokenised central-bank reserves could be combined to complete atomic multi-currency settlement while preserving jurisdiction-specific control over reserves.<sup>162</sup> In July 2026, Agorá moved into controlled real-value testing. Twenty-eight financial institutions and central banks completed 17 transaction scenarios across six currencies, with a total tested value of approximately CHF800,000.<sup>163</sup>

The contrast between Agorá and mBridge is analytically useful. It shows that the cross-border CBDC debate is becoming about how central-bank money should be represented and connected

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<sup>158</sup>Bank for International Settlements, & Institute of International Finance. (2026). Project Agorá: A shared programmable platform for wholesale cross-border payments [Report]. Bank for International Settlements. <https://www.bis.org/publications/project-agora-shared-programmable-platform-wholesale-cross-border-payments.pdf>

<sup>159</sup> Ibid.

<sup>160</sup> Ibid.

<sup>161</sup> Ibid.

<sup>162</sup>Bank for International Settlements. (2026, May 27). Project Agorá shows how tokenisation can improve wholesale cross-border payments; work will advance to real-value testing [Media release]. <https://www.bis.org/media-releases/20260527-project-agora-shows-how-tokenisation-can-improve-wholesale-cross-border-payments-work-will>

<sup>163</sup>Bank for International Settlements. (2026, May 27). Project Agorá. <https://www.bis.org/project/agora>

to private money and financial infrastructure.<sup>164</sup> mBridge places multiple central-bank digital currencies directly onto common infrastructure. Agorá places tokenised commercial-bank money on a unifying layer while keeping tokenised central-bank reserves within jurisdiction-specific layers. Both seek atomic settlement, but they reach it through different institutional architectures.

#### **4.4 Interoperability does not require every currency to share one ledger**

Other experiments have tested less integrated models. Project Icebreaker, involving Israel, Norway and Sweden, examined how separate retail CBDC systems could be connected through a hub-and-spoke arrangement.<sup>165</sup> The project demonstrated that cross-border retail CBDC payments could be completed within seconds without requiring participating central banks to adopt the same underlying technology or place their currencies on a single common ledger.<sup>166</sup>

This is a different conception of interoperability. Rather than building one international settlement system, it treats domestic systems as sovereign endpoints and creates a common mechanism through which they communicate.<sup>167</sup> The trade-off is that more of the surrounding market structure remains necessary: FX providers still supply liquidity, domestic systems still perform settlement and each jurisdiction continues to apply its own rules.<sup>168</sup>

Project Mandala addresses another part of the problem altogether: instead of creating a new settlement asset, it tests whether jurisdiction-specific regulatory compliances can be translated into machine-readable rules and checked before a cross-border transaction proceeds across existing and nascent digital asset systems.<sup>169</sup> Project Nexus provides an even stronger counterfactual. Nexus does not rely on CBDCs at all: it seeks to connect existing domestic instant-payment systems through a standardised multilateral architecture.<sup>170</sup> In 2025, the central banks of India, Indonesia, Malaysia, the Philippines, Singapore and Thailand incorporated

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<sup>164</sup> Naji, R. E. H. (2026). China's digital yuan and the geopolitics of monetary power: CBDCs, dollar dominance, and the future of financial statecraft. *China Quarterly of International Strategic Studies*, 12(1-2), 89–107. [doi.org https://www.worldscientific.com/doi/10.1142/S2377740026500041?srsId=AU7gw4XPZL8tcKHsgWSeKK3EfVCyyTYc huxGgsPHhmk0liIp6-y4Z7Dw](https://www.worldscientific.com/doi/10.1142/S2377740026500041?srsId=AU7gw4XPZL8tcKHsgWSeKK3EfVCyyTYc huxGgsPHhmk0liIp6-y4Z7Dw)

<sup>165</sup> Bank for International Settlements Innovation Hub et al. (2023, March). Project Icebreaker: Breaking new paths in cross-border retail CBDC payments. <https://www.bis.org/publications/project-icebreaker-breaking-new-paths-cross-border-retail-cbdc-payments.pdf>

<sup>166</sup> Ibid.

<sup>167</sup> Ibid.

<sup>168</sup> Ibid.

<sup>169</sup> Bank for International Settlements Innovation Hub et al. (2024, October). Project Mandala: Streamlining cross-border transaction compliance. <https://www.bis.org/publications/project-mandala-streamlining-cross-border-transaction-compliance.pdf>

<sup>170</sup> <https://www.bis.org/publications/nexus-enabling-instant-cross-border-payments.pdf>

Nexus Global Payments to take the model towards live implementation.<sup>171</sup> The underlying proposition is similar to Icebreaker — connect domestic systems through a common hub rather than replace them — but the settlement assets remain those already used by domestic instant-payment systems.<sup>172</sup>

The relevance of Nexus to the CBDC debate is therefore precisely that it is not a CBDC project. It demonstrates that some of the gains sought from cross-border CBDCs may also be pursued by connecting infrastructure that already exists. CBDCs must therefore be evaluated against these alternatives rather than against correspondent banking in isolation.

#### 4.5 What the experiments have established

Taken together, these developments suggest that the principal uncertainties are shifting away from basic technical feasibility and towards the institutional, legal and governance conditions required for deployment at scale.<sup>173</sup> What remains unresolved is whether these capabilities can be translated from successful experiments into infrastructure that central banks and financial institutions are prepared to operate at scale across multiple jurisdictions.<sup>174</sup> Moving from experimentation to production therefore depends increasingly on coordination between sovereign monetary and regulatory systems, rather than on further demonstrations of technical feasibility. In that sense, cross-border CBDC experimentation is increasingly becoming an interoperability experiment for the monetary system as a whole.<sup>175</sup>

### 5. Retail CBDCs: What Deployment Has Taught Us

Retail CBDCs have now been tested for long enough, and in sufficiently different payment environments, to permit a more evidence-based assessment. The emerging question is whether households and businesses have sufficient reason to use them at scale.<sup>176</sup>

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<sup>171</sup>Bank for International Settlements. (2024, July 1). Nexus: Enabling instant cross-border payments [Report]. bis.org <https://www.bis.org/project/nexus>

<sup>172</sup> Ibid.

<sup>173</sup>Soderberg, G., Kiff, J., Tourpe, H., Bechara, M., Forte, S., Kao, K., Lannquist, A., Sun, T., & Yoshinaga, A. (2023, September 8). How should central banks explore central bank digital currency?: A dynamic decision-making framework (Fintech Notes No. 2023/008) [Report]. International Monetary Fund. <https://www.imf.org/-/media/files/publications/ftn063/2023/english/ftnea2023008.pdf>

<sup>174</sup> Ibid.

<sup>175</sup>Mittal, R., Ozdag, M., Karajgi, M., & Crown, E. (2024). Interoperability between central bank digital currency systems and fast payment systems: A technical perspective (Knowledge Brief). World Bank Group. <https://openknowledge.worldbank.org/server/api/core/bitstreams/a6f91b4c-32ee-4962-b51f-e164fb046f6c/content>

<sup>176</sup>Nikitin, D., Schmalholz, J., & Bloch, C. (2025, October). Can retail central bank digital currencies improve the delivery of social safety nets? (IMF Working Papers No. WP/25/211) [Report]. International Monetary Fund. <https://www.imf.org/-/media/files/publications/wp/2025/english/wpiea2025211-source-pdf.pdf>

## 5.1 Launch does not guarantee use

The experience of the first live systems is instructive. The Bahamas, Nigeria and Jamaica all moved from experimentation to national issuance, but none has yet displaced existing forms of money or payment by a material margin.<sup>177</sup> In 2024, the Sand Dollar remained below 0.4% of currency in circulation in the IMF's latest detailed assessment;<sup>178</sup> Nigeria had generated millions of eNaira wallets but most were inactive;<sup>179</sup> and JAM-DEX accounted for only around 0.11% of Jamaican currency in circulation despite more than a quarter of a million registered wallet users.<sup>180</sup> These experiences point to a recurring distinction between availability, adoption and usage: a CBDC can be nationally available, downloaded by a large number of users and still account for only a small share of day-to-day payments.<sup>181</sup>

Later pilots have consequently become more use-case specific. India is testing programmable transfers, offline functionality and interoperability with UPI;<sup>182</sup> China has broadened the e-CNY into public services, fiscal payments and cross-border applications and, from January 2026, changed the treatment of e-CNY balances held in authorised commercial-bank wallets so that they can earn interest and be treated as deposit liabilities; Russia has begun a phased mandatory-access rollout while keeping consumer participation voluntary.

The evolution suggests that the retail-CBDC proposition is moving away from simply creating another digital means of payment and towards identifying functions that existing payment instruments cannot perform as readily.<sup>183</sup>

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<sup>177</sup>Atlantic Council. (2026, May). Central Bank Digital Currency Tracker. GeoEconomics Center.

<https://www.atlanticcouncil.org/cbdctracker/>

<sup>178</sup>International Monetary Fund. (2026, January 20). The Bahamas: 2025 Article IV Consultation-Press Release; and Staff Report (IMF Country Report No. 26/031) [Report].

<https://www.imf.org/-/media/files/publications/cr/2026/english/1bhsea2026001-source-pdf.pdf>

<sup>179</sup>Mancini-Griffoli, T., & Martinez Peria, M. S. (2023). Central bank digital currencies and financial stability (IMF Working Paper No. WP/23/104). International Monetary Fund.

<https://www.imf.org/-/media/files/publications/wp/2023/english/wpiea2023104-print-pdf.pdf>

<sup>180</sup>Noll, F. (2024, April 10). Observations from the retail CBDCs of the Caribbean. Federal Reserve Bank of Kansas City.

<https://www.kansascityfed.org/research/payments-system-research-briefings/observations-from-the-retail-cbdcs-of-the-caribbean/>

<sup>181</sup>Ibid.

<sup>182</sup>Reserve Bank of India. (2026, April 29). Digital Rupee (₹) –

FAQs. <https://www.rbi.org.in/Commonperson/english/Scripts/FAQs.aspx?Id=3686>

<sup>183</sup>Aurazo, J., Banka, H., Frost, J., Kosse, A., & Piveteau, T. (2024, December). Central bank digital currencies and fast payment systems: rivals or partners? (BIS Papers No. 151) [Report]. Bank for International Settlements & World Bank. <https://documents1.worldbank.org/curated/en/099060725223535417/pdf/P180236-8c521fb2-5864-454a-ac44-9d3f0269a9c8.pdf>

## 5.2 Acceptance networks matter

Network economics emerges as a common constraint.<sup>184</sup> Consumers value a payment instrument more when many merchants accept it; merchants have stronger incentives to integrate it when many customers use it.<sup>185</sup> This has been a core finding across both pilot and live retail projects.<sup>186 187</sup> A CBDC entering a market already served by cards, mobile wallets or an instant-payment system must overcome both sides simultaneously. Government incentives, mandatory acceptance, interoperability with existing QR networks and public-sector payments may accelerate this process, but none by itself demonstrates organic consumer preference.<sup>188</sup>

Interoperability can substantially reduce this barrier by allowing a CBDC to make use of payment infrastructure that is already widely accepted. In India, enabling ₹ wallets to transact through existing UPI QR codes has allowed the CBDC to access an established merchant network rather than requiring a parallel acceptance system to be built from scratch.<sup>189</sup> Russia is addressing the same challenge differently, through the phased introduction of merchant acceptance requirements,<sup>190</sup> while Jamaica has focused on expanding the infrastructure available for JAM-DEX payments at the point of sale.<sup>191</sup> Although the approaches differ, they reflect a common lesson from the first retail CBDC deployments: the viability of the monetary instrument cannot be separated from the reach and usability of the network through which it is spent.

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<sup>184</sup>Reshidi, E., Reuter, M., & Patel, M. (2025, November 12). The impact of central bank digital currency on payments competition (Fintech Notes No. 2025/007) [Report]. International Monetary Fund.

<https://www.elibrary.imf.org/view/journals/063/2025/007/article-A001-en.xml>

<sup>185</sup> Ibid.

<sup>186</sup> Phase 2 of the e-HKD pilot concluded that Hong Kong's robust and diversified payment landscape is generally well served by numerous private-sector providers, making the case for an e-HKD contingent on its delivery of clear, substantial and unique advantages that could not be provided by existing payment options.

(<https://www.hkma.gov.hk/media/eng/doc/key-information/press-release/2025/20251028e4a1.pdf>)

<sup>187</sup> The e-CNY is still far from competing with privately-owned payment apps, such as AliPay and WeChat Pay(

<https://www.elibrary.imf.org/view/journals/063/2024/005/article-A001-en.xml> )

<sup>188</sup>Koonprasert, T. T., Kanada, S., Tsuda, N., & Reshidi, E. (2024, September 20). Central bank digital currency adoption: Inclusive strategies for intermediaries and users (Fintech Notes No. 2024/005) [Report]. International Monetary Fund. <https://www.elibrary.imf.org/view/journals/063/2024/005/article-A001-en.xml>

<sup>189</sup>Reserve Bank of India. (2026, April 29). Digital Rupee (₹) –

FAQs.<https://www.rbi.org.in/Commonperson/english/Scripts/FAQs.aspx?Id=3686>

<sup>190</sup>Bank of Russia. (2025, June 25). Bank of Russia proposes new deadlines for full-scale introduction of digital ruble.<https://www.cbr.ru/eng/press/event/?id=24732>

<sup>191</sup>Patterson, C. (2025, August 26). BOJ anticipates digital currency expansion will ease ATM challenges. Jamaica Information Service. <https://jis.gov.jm/boj-anticipates-digital-currency-expansion-will-ease-atm-challenges/>

### 5.3 Headline adoption metrics can mislead

A second lesson is that headline adoption figures provide only a partial measure of a retail CBDC's success.<sup>192</sup> Wallet registrations may be boosted by one-off incentives or government programmes, while cumulative transaction values can conceal activity concentrated among a relatively small group of users.<sup>193</sup> <sup>194</sup>Similarly, the number of registered merchants says little about how frequently CBDC payments are actually accepted. More meaningful measures therefore focus on sustained use: the number of active users, transaction frequency per active wallet, repeat merchant activity, the CBDC's share of overall retail payments, and whether usage persists once incentives or promotional programmes are withdrawn.<sup>195</sup>

### 5.4 Additionality remains the test

The third takeaway concerns additionality. Offline capability can matter where connectivity is unreliable or where a payment system must remain usable during outages. Conditional payments can automate public transfers or commercial transactions. Direct access to public money can matter where cash use is falling sharply. But the empirical question is whether these benefits require a CBDC.<sup>196</sup> Existing fast-payment systems can provide instant transfers; smart contracts can operate with tokenised bank deposits; stored-value instruments can support some forms of offline payment.<sup>197</sup> Retail CBDC therefore faces a higher bar than technical functionality: the function must be valuable, and the CBDC must be a sufficiently advantageous way to provide it.

Taken together, deployment has not established a universal case for retail CBDCs. It has established something narrower. Retail CBDCs can work operationally, and particular functions may be valuable under particular domestic conditions. But sustained voluntary usage remains difficult where established payment alternatives are already cheap and convenient.

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<sup>192</sup>Koonprasert, T., Kanada, T., Tsuda, S., & Reshidi, E. (2024). Central bank digital currency adoption: Inclusive strategies for intermediaries and users (FinTech Notes No. 2024/005). International Monetary Fund.

<https://www.imf.org/-/media/files/publications/ftn063/2024/english/ftnea2024005.pdf>

<sup>193</sup>Bai, H., Cong, L. W., Luo, Mei, & Xie, P. (2024, March 15). Adoption of Central Bank Digital Currencies: Initial evidence from China (FEB-RN Research Paper No. 43/2025) [Working paper]. SSRN.

[https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=502212](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=502212)

<sup>194</sup> Although cumulative e-CNY transactions reached thousands of billions of yuan, the circulating balance of e-CNY accounted for only 0.16% of M0 (cash in circulation), with an average per-capita wallet balance of merely 11.78 yuan (compared to ~3,000 yuan in third-party payment wallets like Alipay/WeChat Pay). Therefore, massive cumulative metrics mask low individual balances and suggest that transaction volumes are heavily weighted toward specific promotional transfers, institutional pilot tests, or limited user

groups.[https://www.cigionline.org/static/documents/Paper\\_No\\_hY016rp.358\\_He.pdf](https://www.cigionline.org/static/documents/Paper_No_hY016rp.358_He.pdf)

<sup>195</sup> Ibid.

<sup>196</sup> Hong Kong Monetary Authority. (2025, October). e-HKD Pilot Programme Phase 2 report [Report].

<https://www.hkma.gov.hk/media/eng/doc/key-information/press-release/2025/20251028e4a1.pdf>

<sup>197</sup> Ibid.

## 6. Wholesale CBDCs: The emerging settlement use case

Wholesale CBDCs begin from a different position than their retail counterparts. Financial institutions already have access to digital central-bank money through reserve accounts and real-time gross settlement systems. The question is therefore not whether wholesale central-bank money should become digital, but how it should interact with financial assets and commercial-bank money that are increasingly moving onto tokenised and programmable infrastructure.<sup>198</sup>

This shift helps explain why wholesale CBDC work has accelerated. The BIS survey of 93 central banks found wholesale CBDC development more advanced on aggregate than retail work, reversing the position recorded only a few years earlier, with tokenisation identified as an important driver.<sup>199</sup> As bonds, fund units and other financial claims move onto tokenised platforms, the settlement of the corresponding cash leg becomes increasingly important. If an asset can be issued and transferred on programmable infrastructure but payment must leave that environment, pass through conventional systems and subsequently be reconciled, some of the potential efficiencies of tokenisation are lost.<sup>200</sup> A wholesale CBDC offers one way of bringing central-bank money into, or connecting it directly with, the infrastructure on which those assets are transacted.<sup>201</sup>

The clearest use cases have consequently emerged around securities and FX settlement. The potential value of wholesale CBDCs lies not simply in faster payments, but in allowing central-bank money to interact directly with tokenised assets and other settlement assets.<sup>202</sup> It can support DvP – where the asset and cash legs are linked so that both settle together or neither does – and payment-versus-payment (PvP) applies the same principle to the two

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<sup>198</sup>Neuhaus, H., & Plooi, M. (2023, December). Central bank money settlement of wholesale transactions in the face of technological innovation. ECB Economic Bulletin, (8/2023).

[https://www.ecb.europa.eu/press/economic-bulletin/articles/2024/html/ecb.ebart202308\\_01~d9a13e1609.en.html](https://www.ecb.europa.eu/press/economic-bulletin/articles/2024/html/ecb.ebart202308_01~d9a13e1609.en.html)

<sup>199</sup>Illes, A., Kosse, A., & Wier, P. (2025, August 22). Advancing in tandem - results of the 2024 BIS survey on central bank digital currencies and crypto (BIS Papers No. 159). Bank for International Settlements. <https://www.bis.org/publications/paper-159-advancing-tandem-results-2024-bis-survey-central-bank-digital-currencies-and-crypto>

<sup>200</sup>KPMG in the Crown Dependencies. (2026, August). Tokenised funds and stablecoins.

<https://kpmg.com/dp/en/insights/2026/08/tokenisation-and-stablecoins.html>

<sup>201</sup>PwC India. (2026). Enabling India to become the global foundry for tokenised assets.

<https://www.pwc.in/research-and-insights-hub/enabling-india-to-become-the-global-foundry-for-tokenised-assets.html>

<sup>202</sup>Bear, K., Zhang, B., Vertex, P., Coelho, H., & Hussain, H. (2024, December). Wholesale Central Bank Digital Currencies (wCBDCs): Approaches, implementation strategies and use cases [Report]. Cambridge Centre for Alternative Finance, Judge Business School, University of Cambridge.

<https://www.jbs.cam.ac.uk/wp-content/uploads/2024/12/2024-12-ccaf-wcbdc-approaches-implementation-strategies-and-use-cases.pdf>

currency legs of an FX transaction.<sup>203</sup> More broadly, this integration can allow payment, asset transfer and related post-trade processes to be coordinated within the same workflow, reducing reliance on separate systems and subsequent reconciliation.<sup>204</sup>

**Table 1: Possible models for central-bank settlement in tokenised markets**

| Model                      | How settlement works                                                          | Examples           | Core policy question                                                   |
|----------------------------|-------------------------------------------------------------------------------|--------------------|------------------------------------------------------------------------|
| Native wCBDC               | Central-bank money exists directly on tokenised infrastructure                | Helvetia           | Does native issuance materially improve settlement?                    |
| Tokenised reserves         | Existing central-bank liabilities are represented in tokenised form           | Agorá              | Can existing monetary architecture be preserved on new infrastructure? |
| RTGS–DLT linkage           | Tokenised assets remain on DLT while cash settles through existing RTGS money | Helvetia / Pontes  | Is connectivity preferable to creating new settlement money?           |
| Mixed settlement ecosystem | Public and private settlement assets coexist                                  | Acacia / Singapore | Which asset is best suited to which transaction?                       |

Notably, the experiences of different jurisdictions and projects reveal an important qualification: the evidence for digitally compatible central-bank settlement is stronger than the evidence that a

<sup>203</sup>Bank for International Settlements. (2021, December 8). Project Jura. <https://www.bis.org/project/jura>

<sup>204</sup>Bear, K., Zhang, B., Vertex, P., Coelho, H., & Hussain, H. (2024, December). Wholesale Central Bank Digital Currencies (wCBDCs): Approaches, implementation strategies and use cases [Report]. Cambridge Centre for Alternative Finance, Judge Business School, University of Cambridge. <https://www.jbs.cam.ac.uk/wp-content/uploads/2024/12/2024-12-ccaf-wcbdc-approaches-implementation-strategies-and-use-cases.pdf>

standalone wholesale CBDC is the only, or necessarily preferred, way to provide it. Switzerland has explored both native wCBDC and mechanisms linking distributed-ledger platforms to its existing RTGS platform;<sup>205</sup> Australia has compared several forms of settlement assets;<sup>206</sup> Agora combines tokenised central-bank reserves with tokenised commercial-bank deposits; and Eurosystems' Pontes is examining ways of connecting tokenised markets to existing central-bank money.<sup>207</sup> Different projects are testing different architectures even as the preferred instrument remains unsettled.

The emerging wholesale use case is therefore best understood not simply as a case for issuing a new form of central-bank money, but as a broader settlement challenge created by tokenisation. As financial markets become more programmable, central banks must determine how risk-free settlement money should operate within them. Wholesale CBDCs are one increasingly credible answer, but experimentation so far suggests that the eventual architecture may also involve tokenised reserves, links to existing RTGS systems, or combinations of public and private settlement assets.

## 7. Regulation, Design and the Emerging Policy Questions

As CBDC work moves from proofs of concept towards live infrastructure, the most difficult questions increasingly concern law, governance and monetary design.<sup>208</sup> The IMF's CBDC Handbook reflects that change: its recent work concentrates on financial stability, payments competition, legal foundations, financial integrity, resilience and tokenised reserves, while explicitly recognising that the appropriate decision differs across jurisdictions.<sup>209</sup>

These design choices cannot be considered in isolation because decisions in one area often have consequences elsewhere.<sup>210</sup> Privacy requirements shape the architecture for AML/CFT

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<sup>205</sup>Swiss National Bank. (n.d.). Project Helvetia.

[https://www.snb.ch/en/the-snb/mandates-goals/payment-transactions/projekt\\_helvetia](https://www.snb.ch/en/the-snb/mandates-goals/payment-transactions/projekt_helvetia)

<sup>206</sup>Digital Pound Foundation. (2024, November 11). Australia to trial wholesale CBDC and asset tokenisation in 2025, calls for industry participation.

<https://digitalpoundfoundation.com/australia-to-trial-wholesale-cbdc-and-asset-tokenisation-in-2025-calls-for-industry-participation/>

<sup>207</sup>European Central Bank. (2026, September 21). Eurosystem brings central bank money to tokenised finance [Press release]. <https://www.ecb.europa.eu/press/pr/date/2026/html/ecb.pr260921-e754847a7b.en.html>

<sup>208</sup>Bechara, M., Dumitrescu-Pasecinic, A., & Kubota, T. (2025, November). Selected legal considerations for central bank digital currencies (Fintech Note No. 2025/006). International Monetary Fund. <https://www.imf.org/-/media/files/publications/ftn063/2025/english/ftnea2025006.pdf>

<sup>209</sup>International Monetary Fund. (n.d.). Central Bank Digital Currency (CBDC) - Virtual Handbook [Reference guide]. <https://www.imf.org/en/topics/digital-payments-and-finance/central-bank-digital-currency/virtual-handbook>

<sup>210</sup>Bank of Canada, Swiss National Bank, European Central Bank, Bank of England, Bank of Japan, Board of Governors of the Federal Reserve System, Sveriges Riksbank, & Bank for International Settlements. (2024, November). Central bank digital currencies: System design. Bank for International Settlements. <https://www.bis.org/publications/central-bank-digital-currencies-system-design.pdf>

compliance, while holding limits influence both the usefulness of a CBDC to users and its potential effects on financial stability.<sup>211</sup> Decisions around programmability raise questions about user autonomy and privacy,<sup>212</sup> and the distribution model determines the role that commercial banks and other intermediaries continue to play.<sup>213</sup> Cross-border functionality adds another layer of complexity by introducing questions over access, data governance and settlement finality across different legal systems.<sup>214</sup>

A CBDC that is technically sophisticated may theoretically still prove difficult to deploy if the legal status of the claim is uncertain, struggle to gain acceptance if users lack confidence in how their data are handled,<sup>215</sup> or create financial-stability concerns if its design encourages significant migration of funds away from commercial-bank deposits.

## 7.1 Legal foundations

A lack of legal certainty, arising from an absent legal foundation for CBDCs, exposes central banks and the broader financial ecosystem to significant legal, financial, and reputational risks. Without legislative amendments, such as expanding the legal definition of a bank note to include digital forms, central banks may lack the foundational authority to issue a CBDC or properly grant it legal tender status.<sup>216</sup> Furthermore, a clear legal framework is necessary to classify the digital asset, define the rights and obligations of participating intermediaries, ensure consumer protection and data privacy, and establish the finality of digital settlements.<sup>217</sup>

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<sup>211</sup> Ponce, J., & Taroco, S. (2026). CBDC's design implications for financial stability. *Latin American Journal of Central Banking*, 7(1), Article 100188. [doi.org https://www.sciencedirect.com/science/article/pii/S2666143825000262](https://www.sciencedirect.com/science/article/pii/S2666143825000262)

<sup>212</sup> Bag, S. (2026, April 14). India's CBDC experiment: Digital Rupee, developmental ambition. Observer Research Foundation. <https://www.orfonline.org/expert-speak/india-s-cbdc-experiment-digital-rupee-developmental-ambition>

<sup>213</sup> Reshidi, E., Reuter, M., & Patel, M. (2025, November 12). The impact of central bank digital currency on payments competition (Fintech Notes No. 2025/007) [Report]. International Monetary Fund. <https://www.elibrary.imf.org/view/journals/063/2025/007/article-A001-en.xml>

<sup>214</sup> Bank of Canada, European Central Bank, Bank of Japan, Sveriges Riksbank, Swiss National Bank, Bank of England, Board of Governors of the Federal Reserve System, & Bank for International Settlements. (2024, November). Central bank digital currencies: System design [Report]. Bank for International Settlements. <https://www.bis.org/publications/central-bank-digital-currencies-system-design.pdf>

<sup>215</sup> The scaling down of Bank of Canada's retail CBDC was partially attributed to privacy concerns raised during stakeholder consultations. Many of these respondents did not trust the Bank and other institutions to protect or respect their privacy. A primary concern was that privacy laws—such as the federal Privacy Act and the Personal Information Protection and Electronic Documents Act—do not offer sufficient protections. <https://www.bankofcanada.ca/digitaldollar/a-digital-canadian-dollar-what-we-heard-2020-23-and-what-comes-next/>

<sup>216</sup> Ahmed, S., & Sengupta, S. (2022, November 16). Examining the policy and legal consideration of a Digital Rupee. Vidhi Centre for Legal Policy. <https://vidhilegalpolicy.in/blog/examining-the-policy-and-legal-consideration-of-a-digital-rupee/>

<sup>217</sup> Bechara, M., Bossu, W., Rasekh, A., Tan, C. Y., & Yoshinaga, A. (2025, March 14). Private law aspects of token-based central bank digital currencies (Fintech Notes No. 2025/003) [Report]. International Monetary Fund. <https://www.imf.org/-/media/files/publications/ftn063/2025/english/ftnea2025003.pdf>

This becomes even more pertinent where CBDCs interact with tokenised assets. A technically atomic transaction has little value if one side of the transaction is not legally final or if ownership of a tokenised security is not recognised by the relevant legal system.<sup>218 219</sup> Wholesale projects are therefore increasingly testing legal and contractual structures alongside code. Agorá's work, for example, treats the legal character of tokenised deposits and central-bank reserves as part of the architecture rather than an issue that can be resolved after the platform is built.<sup>220</sup>

Retail CBDCs raise a different set of questions.<sup>221</sup> An intermediated model must define the responsibilities of the central bank and private wallet providers for customer due diligence, complaints, unauthorised transactions, data storage and operational failures.<sup>222</sup> Additionally, clear legislation is necessary to enforce transaction and holding limits for financial stability, define user rights and data portability if an intermediary fails, and clarify the legal finality of offline transactions.<sup>223</sup> There is therefore no legally neutral technical design: decisions that look like software choices may determine substantive rights and liabilities.

## 7.2 Privacy, data and programmability

Privacy has become one of the most politically sensitive design questions because a digital central-bank instrument can, in principle, generate more granular transaction data than cash.<sup>224</sup> The policy challenge is to provide enough information for fraud prevention, AML/CFT and sanctions compliance without constructing a system in which the central bank unnecessarily sees the identity and transaction history of every user.<sup>225</sup>

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<sup>218</sup>Adrian, T. (2026, April). Tokenized finance (IMF Note No. 2026/001). International Monetary Fund. <https://www.imf.org/-/media/files/publications/imf-notes/2026/english/insea2026001.pdf>

<sup>219</sup>Bechara, M., Dumitrescu-Pasecinic, A., & Kubota, T. (2025, November). Selected legal considerations for central bank digital currencies (Fintech Note No. 2025/006). International Monetary Fund. <https://www.elibrary.imf.org/view/journals/063/2025/006/article-A001-en.xml>

<sup>220</sup>Bank for International Settlements. (2026, May 27). Project Agorá shows how tokenisation can improve wholesale cross-border payments; work will advance to real-value testing [Media release]. <https://www.bis.org/media-releases/20260527-project-agera-shows-how-tokenisation-can-improve-wholesale-cross-border-payments-work-will>

<sup>221</sup>Bechara, M., Dumitrescu-Pasecinic, A., & Kubota, T. (2025, November 11). Selected legal considerations for central bank digital currencies (Fintech Notes No. 2025/006) [Report]. International Monetary Fund. <https://www.elibrary.imf.org/view/journals/063/2025/006/article-A001-en.xml>

<sup>222</sup>Ibid.

<sup>223</sup>Ibid.

<sup>224</sup>Bank of Canada, Swiss National Bank, European Central Bank, Bank of England, Bank of Japan, Board of Governors of the Federal Reserve System, Sveriges Riksbank, & Bank for International Settlements. (2024, November). Central bank digital currencies: Legal aspects of retail CBDCs. Bank for International Settlements. <https://www.bis.org/publications/central-bank-digital-currencies-legal-aspects-retail-cbdc.pdf>

<sup>225</sup>Kiff, J., Alwazir, J., Davidovic, S., Kahn, C. M., & Khiaonarong, T. (2024, May 15). A guide to central bank digital currency offline payments (Fintech Notes No. 2024/004) [Report]. International Monetary Fund. <https://www.elibrary.imf.org/view/journals/063/2024/004/article-A001-en.xml>

The emerging European and British models attempt to separate the payment infrastructure from personal identity. The ECB says online digital-euro data would be pseudonymised so that the Eurosystem could not directly identify the individuals behind transactions, while offline payments are intended to provide a degree of privacy closer to cash.<sup>226</sup> The Bank of England's proposed platform model similarly envisages private intermediaries interacting with users while the Bank operates the core ledger without seeing users' personal data.<sup>227</sup>

These designs do not create absolute anonymity: intermediaries remain subject to applicable due diligence requirements.<sup>228</sup> They instead seek to minimise the amount of personal data visible to the central bank itself. Brazil demonstrates the technological difficulty of implementing this principle on programmable infrastructure. Banco Central do Brasil concluded after the first Drex phase that the privacy technologies tested had not yet matured sufficiently to satisfy all relevant legal privacy requirements, even though the underlying DLT infrastructure was technically viable.<sup>229</sup>

Programmability presents an equally important conceptual distinction. Programmable or conditional payments leave the money fungible but automate the circumstances under which a transaction takes place. The digital euro explicitly rejects programmable money while allowing the possibility of conditional payments.<sup>230</sup> Logic embedded directly into the CBDC itself – for instance, this specific digital dollar can only be spent on food – may cost the CBDC its status as general-purpose money. One CBDC unit would no longer equal another, breaking the core economic rule of fungibility.<sup>231</sup> Defined-end-use public transfers illustrate a different model in

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<sup>226</sup>Digital Watch Observatory. (2026, August 24). ECB outlines privacy protections for digital euro.

<https://dig.watch/updates/ecb-outlines-privacy-protections-for-digital-euro>

<sup>227</sup>Torres Vives, G., Virza, M., Youngblom, R., Calabia, F. C., Vaughan, N., Said, Z., Mundakkal, C., & Mullings, S. (2024, December). Enhancing the privacy of a digital pound [Report]. Bank of England & MIT Digital Currency Initiative.

<https://www.bankofengland.co.uk/-/media/boe/files/digital-pound/mit-report-enhancing-the-privacy-of-a-digital-pound.pdf>

<sup>228</sup><https://www.bankofengland.co.uk/-/media/boe/files/digital-pound/mit-report-enhancing-the-privacy-of-a-digital-pound.pdf>

<sup>229</sup>Banco Central do Brasil. (2026). Press release note 2601 [Press release].

<https://www.bcb.gov.br/en/pressdetail/2601/nota>

<sup>230</sup>The European Central Bank (ECB) holds programmable money and conditional payments to be distinct. ECB defines programmable money as “Digital money with built-in restrictions on where, when, or with whom it can be spent, or an expiration date like a voucher”, which it rejects to maintain full fungibility and trust, ensuring the digital euro matches physical cash. But it allows conditional payments – for example, if a customer buys something online and chooses the option to pay on delivery.

[https://www.ecb.europa.eu/euro/digital\\_euro/faqs/html/ecb.faq\\_digital\\_euro.en.html#q20](https://www.ecb.europa.eu/euro/digital_euro/faqs/html/ecb.faq_digital_euro.en.html#q20)

<sup>231</sup>Bechara, M., Dumitrescu-Pasecinic, A., & Kubota, T. (2025, November 11). Selected legal considerations for central bank digital currencies (Fintech Notes No. 2025/006) [Report]. International Monetary Fund.

<https://www.elibrary.imf.org/view/journals/063/2025/006/article-A001-en.xml>

which restrictions apply to a specific programme or payment rather than to the currency generally.<sup>232</sup>

The distinction between programmable money and programmable payments is significant for public trust. A universally programmable sovereign currency could create concerns that money can be remotely constrained after issuance, which challenges the singleness of money.<sup>233 234</sup> Conditional payments implemented at the application layer can provide many of the same automation benefits without altering the general fungibility of the currency.<sup>235</sup> Hong Kong's e-HKD experiments similarly suggest that much of the value commonly labelled CBDC programmability may actually arise from smart-contract infrastructure surrounding the settlement asset rather than from the CBDC itself.<sup>236</sup>

### 7.3 Financial stability and the banking system

The most persistent macro-financial concern around retail CBDCs is deposit substitution.<sup>237</sup> Households already choose between cash, deposits, money-market instruments and other liquid assets. A universally accessible central-bank liability adds another option, one with no bank credit risk. If it becomes materially more attractive than a bank deposit, particularly during a period of stress, funds could move from commercial banks to the central bank quickly, changing bank funding structures and potentially accelerating digital runs.<sup>238</sup>

This risk is design-dependent rather than binary. A non-interest-bearing CBDC with moderate holding limits is much less likely to compete for savings than an uncapped, remunerated central-bank account.<sup>239</sup> Notably, the prospective digital euro is non-remunerated and subject to

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<sup>232</sup>Press Information Bureau. (2026, August 14). Government of India launches CBDC-based Direct Benefit Transfer under PMGKAY in Chandigarh and Dadra & Nagar Haveli [Press release]. Ministry of Consumer Affairs, Food & Public Distribution. [https://www.pib.gov.in/PressReleasePage.aspx?PRID=2299535@=48\(=2](https://www.pib.gov.in/PressReleasePage.aspx?PRID=2299535@=48(=2)

<sup>233</sup>Bag, S. (2026, April 14). India's CBDC experiment: Digital rupee, developmental ambition. Observer Research Foundation. <https://www.orfonline.org/expert-speak/india-s-cbdc-experiment-digital-rupee-developmental-ambition>

<sup>234</sup>Bechara, M., Dumitrescu-Pasecinic, A., & Kubota, T. (2025, November). Selected legal considerations for central bank digital currencies. IMF Fintech Notes, 2025(006), Article A001. <https://www.elibrary.imf.org/view/journals/063/2025/006/article-A001-en.xml>

<sup>235</sup>Ryu, J., Shin, H. S., Sung, J., & Yun, S. G. (2026, July 1). A unified ledger in practice: lessons from Project Hangang [Paper presentation]. ECB Forum on Central Banking 2026, Sintra, Portugal. [https://www.ecb.europa.eu/pub/pdf/sintra/ecb\\_forumcentbankpub2026\\_Shin\\_paper.sk.pdf](https://www.ecb.europa.eu/pub/pdf/sintra/ecb_forumcentbankpub2026_Shin_paper.sk.pdf)

<sup>236</sup>Hong Kong Monetary Authority. (2025, October). e-HKD Pilot Programme Phase 2 report [Report]. <https://www.hkma.gov.hk/media/eng/doc/key-information/press-release/2025/20251028e4a1.pdf>

<sup>237</sup>Bidder, R., Jackson, T., & Rottner, M. (2025, July). CBDC and banks: Disintermediating fast and slow (BIS Working Papers No. 1280). Bank for International Settlements. <https://www.bis.org/publications/working-paper-1280-cbdc-and-banks-disintermediating-fast-and-slow.pdf>

<sup>238</sup>Ibid.

<sup>239</sup>Bidder, R., Jackson, T., & Rottner, M. (2025). CBDC and banks: Disintermediating fast and slow (BIS Working Papers No. 1280). Bank for International Settlements. <https://www.bis.org/publications/working-paper-1280-cbdc-and-banks-disintermediating-fast-and-slow.pdf>

a holding-limit framework.<sup>240</sup> ECB analysis published in 2026 modelled hypothetical holding limits of up to €3,000 per person and found no material financial-stability effect even under the severe stress scenarios tested, although the final calibration remains a policy decision rather than a settled technical parameter.<sup>241</sup>

China's 2026 e-CNY redesign shows the analysis can dramatically change when remuneration changes. Commercial-bank-operated e-CNY balances can now earn interest and be treated as insured bank deposits.<sup>242</sup> That reduces the distinction between those balances and ordinary commercial-bank deposits and, correspondingly, changes the disintermediation question: the liability increasingly sits within the bank's balance sheet rather than simply representing a competing non-interest-bearing central-bank asset.<sup>243</sup> The case illustrates why “CBDC” can become too broad a label unless its underlying technological and institutional structure is qualified.<sup>244</sup>

Wholesale CBDCs present different financial-stability considerations. Wholesale users are already eligible institutions holding reserves, so the central question is not generally mass retail deposit migration. Instead, policy questions concern intraday liquidity, collateral, operating hours and the fragmentation of liquidity across conventional and on-chain systems.<sup>245</sup> A tokenised reserve platform that operates 24/7 could require banks to manage central-bank liquidity outside existing settlement windows.<sup>246</sup> Conversely, atomic settlement may reduce some collateral and counterparty exposures.<sup>247</sup> The IMF consequently argues that tokenised reserves (wCBDCs) must be assessed alongside monetary policy implementation and liquidity management rather than only as a payments technology.<sup>248</sup>

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<sup>240</sup>European Central Bank. (2026, August 17). FAQs on the digital euro.

[https://www.ecb.europa.eu/euro/digital\\_euro/faqs/html/ecb.faq\\_digital\\_euro.en.html](https://www.ecb.europa.eu/euro/digital_euro/faqs/html/ecb.faq_digital_euro.en.html)

<sup>241</sup>European Central Bank. (2025). Technical data on the financial stability impact of the digital euro (Technical Report).

[https://www.ecb.europa.eu/euro/digital\\_euro/timeline/profuse/shared/pdf/ecb.deprep251010\\_technical\\_annex\\_financial\\_stability\\_impact\\_digital\\_euro.en.pdf](https://www.ecb.europa.eu/euro/digital_euro/timeline/profuse/shared/pdf/ecb.deprep251010_technical_annex_financial_stability_impact_digital_euro.en.pdf)

<sup>242</sup>He, A. (2026, July). China's Central Bank Digital Currency 2.0 and the future of digital finance (CIGI Papers No. 358). Centre for International Governance Innovation.

[https://www.cigionline.org/static/documents/Paper\\_No\\_hY016rp.358\\_He.pdf](https://www.cigionline.org/static/documents/Paper_No_hY016rp.358_He.pdf)

<sup>243</sup>Ibid.

<sup>244</sup>Ibid.

<sup>245</sup>Kunaratskul, T., Lannquist, A., Reslow, A., & Zhang, N. X.-Y. (2025, November). Central bank exploration of tokenized reserves (Fintech Note No. 2025/011). International Monetary Fund.

<https://www.imf.org/-/media/files/publications/ftn063/2025/english/ftnea2025011.pdf>

<sup>246</sup>Adrian, T. (2026, April). Tokenized finance (IMF Notes No. 2026/001) [Report]. International Monetary Fund.

<https://www.imf.org/-/media/files/publications/imf-notes/2026/english/insea2026001.pdf>

<sup>247</sup>Ibid.

<sup>248</sup>Kunaratskul, T., Lannquist, A., Reslow, A., & Zhang, N. X.-Y. (2025, November). Central bank exploration of tokenized reserves. IMF Fintech Notes, 2025(011), Article A001.

<https://www.elibrary.imf.org/view/journals/063/2025/011/article-A001-en.xml>

## 7.4 Coexistence, interoperability and the singleness of money

Debates often frame CBDCs and private digital currencies as substitutes, but the emerging architecture is more complex. Emerging financial markets may contain several forms of money simultaneously: central-bank reserves, tokenised commercial-bank deposits, regulated stablecoins and, in some jurisdictions, retail or wholesale CBDCs.<sup>249</sup>

The practical policy question is therefore shifting from “CBDC or stablecoin?” to “which liabilities should be permitted to perform which monetary functions, and how should they interoperate?”<sup>250</sup> Attributes can be complementary as well as competitive: a tokenised bank deposit preserves a claim on a regulated bank and integrates naturally with bank credit creation, a CBDC or tokenised reserve provides the safest settlement asset, while a well-regulated stablecoin may offer portability across certain public blockchains or cross-border networks.<sup>251</sup>

This coexistence also places renewed importance on convertibility at par.<sup>252</sup> The monetary system works because a pound or rupee deposited at one bank is generally accepted as equivalent to the same unit held at another bank or in cash. Tokenisation should not create multiple forms of apparently identical sovereign currency that trade at persistent discounts because they are trapped on different, siloed networks.<sup>253</sup> Maintaining the singleness of money therefore requires legal redemption rights, liquidity arrangements and interoperable settlement, not simply identical currency labels.<sup>254</sup>

## 7.5 Monetary sovereignty and geopolitics

CBDCs have geopolitical implications, but these should be described more carefully than a simple contest between rival digital-currency blocs. Countries that rely heavily on foreign payment providers, correspondent banks or foreign-currency instruments may have less control over how domestic or cross-border payments function. CBDCs, local-currency payment links and tokenised settlement platforms can therefore increase their strategic options. That does not

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<sup>249</sup>Marjona, K., Nurhayati, N., & Qudratov, I. (2026). Stablecoins, central bank digital currencies, and the future of the monetary system. *Jurnal Eko-Bisma*, 5(1), 318–327.

<https://pdfs.semanticscholar.org/b7bd/6aa0b2f3169db541b7baf7f20019f66d098f.pdf>

<sup>250</sup>Jivakanont, V., & Crespy, N. (2025, December 3). CBDCs vs. stablecoins: Competing or complementary roles? *Suara SEACEN*. <https://suara.seacen.org/cbdcs-vs-stablecoins-competing-or-complementary-roles/>

<sup>251</sup>Ibid.

<sup>252</sup>Soni, U., & Su, J. (2026, September 15). One money, many rails: Keeping digital money fungible. CFA Institute Market Integrity Insights.

<https://blogs.cfainstitute.org/marketintegrity/2026/09/15/one-money-many-rails-keeping-digital-money-fungible/>

<sup>253</sup>Adrian, T. (2026, April). Tokenized finance (IMF Notes No. 2026/001) [Report]. International Monetary Fund.

<https://www.imf.org/-/media/files/publications/imf-notes/2026/english/insea2026001.pdf>

<sup>254</sup>Ibid.

mean every such project is principally designed to evade sanctions or displace the dollar. Taken together, these developments point more clearly towards interconnected national systems than towards monetary unification: national currencies and domestic infrastructures are being linked more closely without necessarily being merged.

## 8. India Spotlight: From payments to programmable and tokenised money

India did not introduce the e₹ into a weak or technologically stagnant payment system. It introduced it into a market already transformed by the Unified Payments Interface. This poses a test to the CBDC proposition: the longer-term case for e₹ therefore depends on whether central-bank money can provide functionality that UPI, which transfers commercial-bank money, even across borders, does not.<sup>255</sup>

RBI data has repeatedly shown UPI accounting for the large majority of India's digital-payment transaction volume, with a system that supports instant bank-account transfers through an enormous existing QR and mobile-payment network.<sup>256</sup> On the other hand, e₹ in circulation fell by 24.08% to ₹771.66 crore as of 31 March 2026, while e₹-Wholesale in circulation stood at zero.<sup>257</sup> The RBI has clarified that balances do not reflect transaction volumes or values due the auto-redemption feature exercised by participating banks and non-banks at the end of the day.<sup>258</sup>

India is therefore a particularly demanding test of CBDC additionality. In markets where access to digital payments remains limited, a CBDC may itself constitute new payment infrastructure. In India, the relevant benchmark is a mature system in which commercial-bank money already moves instantly and at a very large scale.<sup>259</sup> The e₹ must therefore be assessed against functioning alternatives rather than against the absence of digital payments.

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<sup>255</sup> UPI is currently operational in 11 countries.

(<https://www.pib.gov.in/PressReleasePage.aspx?PRID=2302657&reg=48&lang=2>)

<sup>256</sup> UPI processed a record 24.51 billion transactions worth Rs 29.82 lakh crore in August 2026, according to NPCI data. (<https://www.medianama.com/2026/09/223-upi-transactions-august-2026/>)

<sup>257</sup> Press Trust of India. (2026, May 29). Retail central bank digital currency in circulation falls by 24% in FY26. The Economic Times.

<https://m.economictimes.com/news/economy/finance/retail-central-bank-digital-currency-in-circulation-falls-by-24-in-fy26/articleshow/131394155.cms>

<sup>258</sup> Ibid.

<sup>259</sup> Indian Bank. (n.d.). Frequently Asked Questions (FAQs) on RTGS and NEFT [Reference guide].

[https://indianbank.bank.in/documents/d/guest/english\\_faq\\_neft\\_rtgs-1](https://indianbank.bank.in/documents/d/guest/english_faq_neft_rtgs-1)

## 8.1 The evolution of the pilot

RBI launched the wholesale e₹ pilot on 1 November 2022 for settlement of secondary-market transactions in government securities.<sup>260</sup> The retail pilot followed on 1 December 2022 in a closed user group of participating customers and merchants.<sup>261</sup> Retail users hold e₹ in digital wallets provided by participating institutions and can make person-to-person and person-to-merchant payments; the wholesale pilot was subsequently extended to interbank lending and borrowing.<sup>262</sup>

The retail architecture has expanded materially since launch. RBI introduced interoperability between CBDC and UPI QR codes so that an e₹ user can pay at existing UPI acceptance points instead of requiring every merchant to display separate CBDC infrastructure.<sup>263</sup> This may prove one of the most important design decisions in the pilot because it separates adoption of the money from adoption of a new merchant network.

Interoperability does not, however, answer why a consumer would choose e₹ rather than make a UPI payment directly from a bank deposit. The distinction is monetary rather than primarily experiential: e₹ is central-bank money, whereas UPI transfers claims on commercial banks. For a normal low-value retail payment, that distinction is unlikely to be visible to the user. The search for additionality therefore increasingly lies in functions built around the payment.

## 8.2 Programmability is a public-purpose use case

RBI's 2024–25 Annual Report records several experiments: programmability was used for direct-benefit transfers to farmers against carbon-credit-related activities, for loans to tenant farmers under Kisan Credit Card arrangements in selected locations, and for employee fuel and meal allowances.<sup>264</sup> The e₹ was also used as a payment channel for approximately 88,000 beneficiaries under Odisha's Subhadra Yojana, while RBI reported discussions with central ministries and state governments about further defined-end-use transfers.<sup>265</sup>

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<sup>260</sup>Press Information Bureau. (2022, December 12). Central Bank Digital Currency (CBDC) pilot launched by RBI in retail segment has components based on blockchain technology [Press release]. Ministry of Finance. <https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=1882883>

<sup>261</sup>Reserve Bank of India. (2026, April 29). Digital Rupee (e₹) – FAQs. <https://www.rbi.org.in/Commonperson/english/Scripts/FAQs.aspx?Id=3686>

<sup>262</sup>Ibid.

<sup>263</sup>Ibid.

<sup>264</sup>PTI. (2025, May 29). e-Rupee in circulation grows to ₹1,016 crore; RBI explores cross-border CBDC pilots. The Hindu. <https://www.thehindu.com/business/e-rupee-in-circulation-grows-to-1016-crore-rbi-explores-cross-border-cbdc-pilot/article69632789.ece>

<sup>265</sup>Ibid.

The potential proposition is one of standardisation: programmable CBDC infrastructure could provide governments with a common mechanism for distributing, restricting where appropriate, and auditing defined-purpose transfers. The proposition must nevertheless be treated carefully. The ability to define how public transfers may be spent raises governance questions about consent and fungibility. This echoes the European Central Bank's argument on programmable payments versus programmable money: a welfare payment intentionally restricted to a defined purpose is analytically different from imposing restrictions on ordinary ₹ balances held by consumers.

### 8.3 Offline functionality should demonstrate additionality and inclusion

Offline functionality provides a second possible area of additionality. UPI's success depends substantially on digital connectivity, even though India has also developed offline or low-connectivity payment options within the wider payments ecosystem.<sup>266</sup> RBI has therefore continued to test ₹ designs capable of operating under limited connectivity.<sup>267</sup>

The policy case is strongest where unreliable connectivity would otherwise exclude users or where the payment system needs an additional resilience layer. But offline CBDC introduces difficult technological trade-offs: devices must be able to verify value without continuously contacting the central ledger while also preventing the same digital token from being spent twice.<sup>268</sup> Limits on offline balances, transaction values and the length of time a wallet can remain disconnected can reduce the risk but also reduce the cash-like utility of the feature.<sup>269</sup>

India's experience may therefore help determine whether offline CBDC offers a material improvement over alternative offline-payment technologies rather than merely demonstrating that it is technically achievable. The question should be evaluated in terms of actual failure scenarios, rural connectivity, device accessibility and user behaviour, not simply whether an offline transaction can be completed in a pilot.

### 8.4 Retail adoption reveals the additionality problem

While UPI interoperability solves a large part of the merchant-acceptance problem for ₹-Retail, it also makes the substitution question sharper. At a merchant QR code, both routes can

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<sup>266</sup> UPI has evolved to include advanced functionalities such as offline payments through near field communication (NFC) technology (UPI Lite X), payments through feature phones (UPI 123Pay), and AI based conversational payments (hello! UPI). ([https://rbi.org.in/scripts/BS\\_ViewBulletin.aspx?Id=22453](https://rbi.org.in/scripts/BS_ViewBulletin.aspx?Id=22453))

<sup>267</sup> Reserve Bank of India. (2026, April 29). Digital Rupee (₹) – FAQs. <https://www.rbi.org.in/Commonperson/english/Scripts/FAQs.aspx?Id=3686>

<sup>268</sup> Bank of England. (2025, April 10). Digital pound experiment report: Offline payments [Report]. <https://www.bankofengland.co.uk/report/2025/digital-pound-experiment-report-offline-payments>

<sup>269</sup> Ibid.

produce an almost instantaneous payment denominated in rupees. The consumer therefore needs another reason- resilience, privacy, a government use case, offline capability or some other feature- to hold and actively select e₹.

The RBI has publicly confirmed the broadening of participants, UPI interoperability and continuing tests of programmability and offline functionality. However, even if registrations rise substantially, the relevant evidence will be whether users continue to hold and transact in e₹ when incentives or pilot targets are removed.<sup>270</sup> The relevant test is therefore whether UPI interoperability becomes a bridge to sustained e₹ use, rather than merely making CBDC technically available wherever UPI is already accepted.

### **8.5 Wholesale e₹ is linked to the tokenisation question**

The wholesale case is structurally different. RBI's original e₹-W experiment settled secondary-market government-securities transactions using central-bank digital money. It was subsequently extended to interbank lending and borrowing, and RBI has identified tokenisation of assets as an area for further CBDC experimentation. Notably, SEBI launched the Demat 2.0 pilot project in September 2026 to issue and settle tokenised corporate bonds using the Reserve Bank's e₹-W.<sup>271</sup>

The relevant question is whether placing central bank money on, or making it interoperable with, tokenised market infrastructure creates measurable benefits over India's existing securities and RTGS arrangements. Those benefits could include atomic DvP, automated collateral movements, fewer reconciliation steps or more flexible settlement hours. But India's existing financial-market infrastructure already provides central-bank settlement and mature securities depositories. As in Australia and Switzerland, the appropriate benchmark is therefore not outperforming an inefficient paper process, but a functioning electronic system.

This suggests that the long-term case for e₹-W may depend on the development of tokenised assets around it. A wholesale CBDC has limited additionality if the securities, collateral and deposits it settles remain entirely on conventional infrastructure. Its value can increase if more market instruments move onto programmable platforms and participants need a cash leg that can settle within the same or interoperable environment. Equally pertinent would be to boost

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<sup>270</sup>Bai, H., Cong, L. W., Luo, M., & Xie, P. (2024, March 15). Adoption of central bank digital currencies: Initial evidence from China (FEB-RN Research Paper No. 43/2025). SSRN. <https://ssrn.com/abstract=5022129>

<sup>271</sup> Securities and Exchange Board of India. (2026, September 10). Successful launch of "Demat 2.0" pilot project for tokenised corporate bonds (PR No. 56/2026) [Press release]. [https://www.sebi.gov.in/media-and-notifications/press-releases/sep-2026/successful-launch-of-demat-2-0-pilot-project-for-tokenised-corporate-bonds\\_104418.html](https://www.sebi.gov.in/media-and-notifications/press-releases/sep-2026/successful-launch-of-demat-2-0-pilot-project-for-tokenised-corporate-bonds_104418.html)

the tokenisation ecosystem with regulatory clarity around the legal nature, issuance, distribution, and compliant trade of tokenised assets.<sup>272</sup>

## 8.6 Cross-border potential can be met through more than one instrument

India also has an unusual cross-border counterfactual because it is already exporting or linking its existing digital-payment infrastructure.<sup>273</sup> RBI research notes UPI connections and acceptance arrangements involving markets including Singapore, the UAE, Nepal, Bhutan and Mauritius, while the Reserve Bank has separately identified bilateral and multilateral CBDC pilots as an area for exploration.<sup>274</sup>

This means that an Indian cross-border CBDC initiative must be compared not only with correspondent banking but with UPI-based payment links and other fast-payment interconnections. For retail remittances, directly connecting domestic instant-payment systems may deliver much of the speed and user convenience sought from CBDCs without introducing a new settlement asset. A CBDC becomes more compelling where central bank settlement itself provides an additional benefit, for example, in wholesale FX, tokenised trade settlement or a multi-currency platform requiring atomic PvP.

India's BRICS role reinforces the importance of keeping these concepts separate. The September 2026 New Delhi Declaration supports work on cross-border payment interoperability and greater local-currency settlement, but it does not commit India to a BRICS digital currency or even require that local currency payments use CBDCs. India's strategy can therefore combine UPI links, conventional banking channels, local-currency settlement and CBDC experimentation rather than treating them as mutually exclusive.

## 8.7 What India's experiment can establish

India may ultimately be more important to the global CBDC debate for what it reveals about additionality than for whether it becomes one of the largest CBDC issuers. Its retail experiment tests whether central-bank money can offer meaningful capabilities alongside an already ubiquitous instant-payment system; its wholesale work tests whether tokenised markets create a stronger need for digitally compatible central-bank settlement. Cross-border experimentation

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<sup>272</sup>Sharma, A. K. (2026, September 16). Beyond UPI: How asset tokenisation unleashes India's illiquid wealth. ETGovernment.

<https://government.economictimes.indiatimes.com/blog/beyond-upi-how-asset-tokenisation-unleashes-indias-illiquid-wealth/134276119>

<sup>273</sup>Financial Stability Board. (2025, October 9). G20 Roadmap for Enhancing Cross-border Payments: Consolidated progress report for 2025 [Report]. <https://www.fsb.org/uploads/P091025-1.pdf>

<sup>274</sup>Ibid.

faces a similarly demanding counterfactual because India is already connecting UPI with payment systems abroad.

The broader lesson is that a single national decision to “launch” a CBDC may reveal less than the outcomes of these individual use cases. The important question is no longer whether a digital rupee can be built, but where using one is materially better than moving ordinary rupees through infrastructure India already has.

## **9. Outlook and Policy Implications**

The CBDC landscape in 2026 is more developed than it was at the beginning of the decade. But, a more granular look reveals that progress has been far from linear. Exploration has become widespread without producing widespread issuance. 91% of 93 central banks participating in BIS’ survey were engaged in retail CBDC, wholesale CBDC or both, while wholesale work had moved ahead of retail work on aggregate. The divergence is important because it shows that the next stage should not be measured primarily by counting how many countries formally launch a CBDC.

For retail CBDCs, the principal unresolved issue remains demand. The Bahamas, Nigeria and Jamaica have demonstrated national issuance but not mass displacement of existing payment instruments. China has achieved a vastly greater scale but continues to change the economic and institutional design of the e-CNY. Russia’s September 2026 rollout will provide a new test in a market where acceptance is being phased in through regulatory obligations. India continues to search for additionality alongside UPI. Canada, Sweden, South Africa and Australia illustrate the opposite outcome: extensive research can rationally lead to preparedness or postponement rather than launch.

This suggests that retail-CBDC progress over the next several years will be better assessed through usage quality than issuance status. The relevant indicators are likely to include active rather than registered wallets, repeat merchant transactions, the share of payments completed without incentives, offline usage during genuine connectivity failures, public-transfer efficiency and evidence that consumers value CBDC functionality that cannot be obtained as easily through existing payment systems.

Wholesale development is likely to be assessed differently. The key milestone is movement from isolated experiments into production or production-adjacent financial-market infrastructure. Switzerland’s live wCBDC settlement on SDX, the Eurosystem’s launch of Pontes, Hong Kong’s EnsembleTX work and Australia’s comparative Acacia trials are signs that this transition has begun.

But the outcome need not be universal adoption of wCBDC as a single product. Native tokenised reserves, links to conventional RTGS systems, tokenised deposits and regulated stablecoins are all being tested as elements of the settlement stack. The most consequential wholesale question is therefore likely to be what becomes the cash leg of tokenised finance. The BIS favours an architecture anchored by tokenised central-bank reserves and commercial-bank money, while experiments such as Acacia and national initiatives such as Singapore's deliberately test a wider set of regulated settlement assets.

Cross-border development will meanwhile depend increasingly on interoperability. Project Agorá, mBridge and the earlier multi-CBDC experiments show that atomic multi-currency settlement is technically achievable, while instant-payment interlinking demonstrates that some cross-border improvements can be obtained without CBDCs. The harder constraints are now governance, foreign access, liquidity, legal finality, compliance and data. The next phase will therefore test whether sovereign systems can become more interoperable without requiring countries to surrender control over domestic money.

Political cooperation is moving in the same direction. The BRICS New Delhi Declaration supports interoperability and greater use of local currencies while explicitly preserving national priorities; ASEAN continues to prioritise payment connectivity rather than a common regional CBDC. The international monetary system is therefore more likely to develop through interconnected national and regional infrastructures than through a single global digital currency platform.

Regulation will become correspondingly more important. Stablecoins are moving into more formal regulatory regimes, tokenised bank deposits are being incorporated into central-bank experiments, and CBDC designs increasingly rely on private intermediaries. Singapore's 2026 stablecoin proposals, the BIS's work on tokenised money and the IMF's work on tokenised reserves all point towards a policy framework concerned with coexistence among forms of money, rather than a contest in which one digital instrument eliminates the others.

Five questions should therefore determine how CBDC progress is assessed through the remainder of the decade:

1. Can retail CBDCs achieve sustained voluntary usage? Issuance and wallet registrations are weak proxies if users return to existing instruments after incentives end.
2. Which retail functions genuinely require central-bank digital money? Offline resilience, access to public money, targeted transfers and privacy may support issuance in some jurisdictions, but each should be evaluated against non-CBDC alternatives.

3. What form of central-bank money best supports tokenised wholesale markets? A standalone wholesale CBDC is one option, but tokenised reserves and synchronisation with existing RTGS systems may accomplish similar objectives.
4. Can interoperability keep pace with tokenisation? Without common technical, legal and messaging standards, new digital infrastructure could reproduce the same fragmentation that CBDC projects are intended to reduce.
5. Finally, how should public and private money coexist? Tokenised deposits and regulated stablecoins are no longer peripheral to the CBDC discussion. They increasingly form part of the same architecture, making convertibility, redemption, settlement finality and the singleness of sovereign money central regulatory concerns.

## 10. Conclusion

The first decade of modern CBDC experimentation has therefore produced a more nuanced conclusion than either advocates or sceptics initially anticipated. It has demonstrated that central banks can issue sovereign money in new digital forms; that CBDCs can support programmable, offline and cross-border transactions; and that central-bank money can be integrated with tokenised financial assets. What it has not demonstrated is that these capabilities require the same instrument in every market.

For retail payments, the case remains highly dependent on domestic conditions. Where existing payment infrastructure is weak, access to public digital money may address genuine inclusion or resilience gaps. Where payment systems are already cheap, fast and ubiquitous, a CBDC must demonstrate additional value rather than merely reproduce an existing consumer experience. The limited usage of several early live CBDCs and the decisions by advanced economies to postpone issuance reinforce that distinction.

For wholesale markets, the direction is clearer but the architecture remains open. Tokenisation is creating a stronger case for central-bank money that can interact with programmable infrastructure, support atomic settlement and operate alongside tokenised private money. The experiments now moving towards live or operational settings suggest that this problem is becoming concrete. They do not, however, establish that a standalone wholesale CBDC is always preferable to tokenising reserves or linking DLT platforms to existing central-bank accounts.

The wider implication is that the CBDC debate is becoming less about the digitisation of currency and more about the architecture of money. Central banks are having to decide how public money should coexist with commercial-bank deposits, stablecoins and tokenised financial assets; how monetary sovereignty can be preserved while payment systems become

more interconnected; and how the safety associated with central-bank settlement can be retained on infrastructure that may operate continuously, programmatically and across national borders.

The most meaningful measure of progress will therefore not be the number of countries that add a CBDC to the forms of money already in circulation. It will be whether central banks can identify the functions for which a new representation of public money produces a demonstrable improvement over the alternatives.

The first decade of CBDC experimentation established that central-bank money can change form. The next will determine where it actually needs to be.

## Appendix

**Table 2: Jurisdiction-Wise Status Table**

| Country / jurisdiction | Status                      | Key recent development                                                                                                                                                                                          | Milestones                                                                                                                                                                                                                                                |
|------------------------|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>The Bahamas</b>     | <b>Retail CBDC launched</b> | The Sand Dollar remains operational, with the focus shifting from issuance to adoption and integration. The central bank is developing a fast-payment system intended to be interoperable with the Sand Dollar. | <p><b>2020:</b> Sand Dollar launched nationally.</p> <p><b>2024:</b> SandDollar Wallet 2.0 introduced; consumer wallet activations reached about 133,000.</p> <p><b>2026:</b> Fast-payment-system work begins with Sand Dollar integration envisaged.</p> |
| <b>Jamaica</b>         | <b>Retail CBDC launched</b> | JAM-DEX remains in national rollout. By end-2025, about 305,000 wallets were registered; POS enablement, additional wallet providers and government-payment use cases remain priorities.                        | <p><b>2021:</b> First CBDC minted.</p> <p><b>2022:</b> JAM-DEX became legal tender and national rollout began.</p> <p><b>2025:</b> Tax-payment pilot completed; second public wallet provider launched; POS retrofitting progressed.</p>                  |

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| <b>Nigeria</b> | <b>Retail CBDC launched</b>                              | The eNaira remains operational, but sustained adoption has been limited. Recent policy discussion has increasingly focused on finding clearer use cases, including government payments and financial inclusion, rather than treating the CBDC primarily as a competing consumer wallet. | <p><b>2021:</b> eNaira launched, becoming Africa's first retail CBDC.</p> <p><b>2022–23:</b> Wallet and USSD access expanded.</p> <p><b>2025–26:</b> Continued operation alongside reassessment of adoption and use cases.</p>                                           |
| <b>China</b>   | <b>Large-scale retail pilot; active cross-border use</b> | From January 2026, real-name e-CNY balances held through authorised commercial banks began earning interest and being treated more like bank deposits. By November 2025, the system had processed 3.48 billion transactions worth CNY16.7 trillion.                                     | <p><b>2014:</b> PBOC research begins.</p> <p><b>2020:</b> Public pilots begin.</p> <p><b>2022:</b> e-CNY app pilot expands.</p> <p><b>2025:</b> 3.48bn cumulative transactions.</p> <p><b>2026:</b> Deposit-like framework introduced for qualifying wallets.</p>        |
| <b>India</b>   | <b>Retail and wholesale pilots</b>                       | The RBI continues expanding both pilots. Retail work has moved beyond basic P2P/P2M payments into programmability, offline functionality and government-benefit applications; tokenisation of corporate bonds and cross-border CBDC                                                     | <p><b>Nov 2022:</b> ₹-W pilot launched.</p> <p><b>Dec 2022:</b> ₹-R pilot launched.</p> <p><b>2023:</b> UPI QR interoperability introduced.</p> <p><b>2024–26:</b> Programmable, offline, welfare, corporate bond tokenisation, and cross-border use cases expanded.</p> |

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|                   |                                                                  | arrangements are also being explored.                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                            |
| <b>Russia</b>     | <b>Phased live retail rollout</b>                                | Large-scale use began on 1 September 2026, with major banks and large retailers required to provide digital-ruble functionality. Coverage will expand to additional banks and merchants through 2028; individual use remains voluntary.                                                                                 | <p><b>2023:</b> Real-value pilot begins.</p> <p><b>2025:</b> Rollout timetable enacted.</p> <p><b>Sep 2026:</b> Major banks and large merchants enter rollout.</p> <p><b>2027–28:</b> Mandatory infrastructure coverage broadens.</p>                      |
| <b>Kazakhstan</b> | <b>Advanced implementation / preparing full-scale production</b> | The Digital Tenge moved beyond laboratory testing into limited-production government-payment use cases. January 2026 legal amendments recognise it as a digital form of the national currency and legal tender; work in 2026 is focused on scaling programmable public expenditure and preparing full-scale production. | <p><b>2021:</b> Initial pilot.</p> <p><b>2023:</b> Limited-production platform launched.</p> <p><b>2024–25:</b> Programmable public-spending pilots scaled.</p> <p><b>2026:</b> Legal framework strengthened and full-production preparation underway.</p> |

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| <b>Euro area</b>      | <b>Advanced preparation; issuance not yet decided</b>                           | The ECB selected 36 payment service providers in July 2026 and is recruiting merchants for a 12-month pilot beginning in H2 2027. The ECB aims to be technically ready for potential first issuance in 2029, assuming the legislation is adopted; an issuance decision has not yet been made.                        | <b>2021–23:</b> Investigation phase.<br><b>2023:</b> Preparation phase begins.<br><b>2026:</b> PSPs selected for pilot.<br><b>H2 2027:</b> Planned real-life beta pilot.<br><b>2029:</b> Earliest targeted readiness for potential issuance, conditional on legislation. |
| <b>France</b>         | <b>Advanced wholesale experimentation; retail work through the digital euro</b> | The Banque de France has tested tokenised central-bank settlement through its DL3S platform, including securities, FX and automated wholesale payments. It also represents the Eurosystem in Agorá, which published prototype findings in May 2026. France's retail CBDC trajectory is covered by the euro-area row. | <b>2020:</b> Wholesale CBDC experimentation programme launched.<br><b>2023:</b> Findings from twelve experiments published.<br><b>2024:</b> DL3S used in Eurosystem settlement trials; Agorá launched.<br><b>2026:</b> Agorá prototype findings published.               |
| <b>United Kingdom</b> | <b>Design phase; no issuance decision</b>                                       | The Bank of England and HM Treasury are completing the digital-pound blueprint and assessment in 2026. The Digital Pound Lab has tested potential retail-payment capabilities, but no decision to proceed to a build phase has yet been announced.                                                                   | <b>2023:</b> Public consultation.<br><b>2024:</b> Design phase begins.<br><b>2025:</b> Digital Pound Lab launched.<br><b>2026:</b> Design phase concludes; decision on next steps expected.                                                                              |

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| <b>Sweden</b>      | <b>Research / legal preparedness; no issuance decision</b> | The technical e-krona pilot has concluded. In March 2026, the Riksbank recommended preparing the legislative groundwork that would allow an e-krona to be introduced relatively quickly if a future decision were taken.                                                                      | <p><b>2017:</b> e-krona project begins.</p> <p><b>2020–23:</b> Technical pilot conducted.</p> <p><b>2023:</b> Technical project completed.</p> <p><b>2026:</b> Riksbank proposes legislative-preparation inquiry.</p>     |
| <b>Switzerland</b> | <b>Wholesale CBDC production pilot</b>                     | Project Helvetia is testing two approaches in production: native wCBDC on SIX Digital Exchange and settlement of tokenised assets through a link to conventional RTGS money. The project now runs until at least June 2028; this does not represent a commitment to permanent wCBDC issuance. | <p><b>2020:</b> Helvetia experimentation begins.</p> <p><b>2023:</b> Live wCBDC pilot enters production environment.</p> <p><b>2025:</b> RTGS-link approach added.</p> <p><b>2028:</b> Current minimum pilot horizon.</p> |
| <b>Canada</b>      | <b>Retail work scaled down / contingency research</b>      | The Bank of Canada has completed much of its preparatory retail-CBDC research and scaled down the programme, while retaining the ability to respond if conditions change. Its payments work has shifted towards broader retail, wholesale and cross-border infrastructure.                    | <p><b>2016:</b> Project Jasper begins wholesale DLT experimentation.</p> <p><b>2020–23:</b> Digital-dollar contingency work and consultation.</p> <p><b>2024:</b> Dedicated retail-CBDC work scaled down.</p>             |

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| <b>United States</b> | <b>Federal retail CBDC development halted</b>                   | A January 2025 executive order prohibits federal agencies, subject to applicable law, from taking action to establish, issue or promote a CBDC and directed ongoing CBDC initiatives to be terminated.                                                                                         | <p><b>2022:</b> Federal Reserve publishes CBDC discussion paper.</p> <p><b>2022–24:</b> Technical research includes Hamilton/Cedar and participation in Agorá-related wholesale work.</p> <p><b>2025:</b> Executive policy reverses domestic CBDC development.</p> <p><b>2026:</b> statutory freeze on retail CBDC</p> |
| <b>Australia</b>     | <b>Retail deprioritised; wholesale experimentation active</b>   | In September 2026, the RBA and Treasury again concluded that there is no clear public-interest case for a retail CBDC at present. Wholesale work continues following Project Acacia, including research into tokenised reserves and how central-bank settlement can support tokenised markets. | <p><b>2023:</b> Retail CBDC pilot completed.</p> <p><b>2024:</b> Initial assessment finds no clear retail case.</p> <p><b>2024–26:</b> Project Acacia tests wholesale tokenised settlement.</p> <p><b>2026:</b> Retail conclusion reaffirmed.</p>                                                                      |
| <b>Brazil</b>        | <b>Tokenisation/wCBDC pilot; next architecture under review</b> | Phase 2 of the Drex pilot has concluded, with the report still being prepared. Testing has increasingly centred on tokenised assets, smart contracts and DvP rather than a simple retail payment instrument; privacy and data                                                                  | <p><b>2021:</b> Digital-real guidelines.</p> <p><b>2023:</b> Drex pilot begins.</p> <p><b>2024:</b> Phase 2 launched with 13 use cases.</p> <p><b>2026:</b> Phase 2 concluded; next steps under review.</p>                                                                                                            |

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|               |                                                                                             | protection remain important technical constraints.                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                      |
| <b>Mexico</b> | <b>Domestic CBDC development / proof of concept; wholesale cross-border experimentation</b> | Banco de México has tested CBDC issuance, redemption and transfers using existing SPEI infrastructure. It also participates in Project Agorá, whose May 2026 findings demonstrated cross-border settlement using tokenised commercial-bank deposits and central-bank reserves. These are distinct strands of experimentation. | <p><b>2024:</b> CBDC proof of concept completed; Banco de México joins Agorá.</p> <p><b>2026:</b> Agorá prototype findings published, with further real-value testing announced.</p>                                 |
| <b>Chile</b>  | <b>Research and technical proof of concept; no issuance commitment</b>                      | In June 2025, the Central Bank of Chile began practical CBDC exploration through a proof of concept, examining DLT capabilities and interaction with existing central-bank systems. The exercise is intended to assess potential benefits and risks and build internal expertise.                                             | <p><b>2021:</b> CBDC-specific exploration begins.</p> <p><b>2022:</b> First assessment report published.</p> <p><b>2024:</b> Second report published.</p> <p><b>2025:</b> Began practical proof-of-concept work.</p> |

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| <b>Hong Kong SAR</b> | <b>retail pilot completed; wholesale work prioritised</b> | EnsembleTX is conducting real-value transactions in tokenised deposits and digital assets during 2026. The HKMA plans progressively to support settlement in tokenised central-bank money on an around-the-clock basis.                                                                              | <p><b>2021:</b> e-HKD study begins.</p> <p><b>2023–25:</b> Two retail-pilot phases.</p> <p><b>2024:</b> Ensemble Sandbox begins.</p> <p><b>2025:</b> EnsembleTX enters real-value pilot.</p> <p><b>2026:</b> Tokenised central-bank settlement capability under development.</p> |
| <b>Japan</b>         | <b>Retail technical pilot; no issuance decision</b>       | The Bank of Japan continues its CBDC Pilot Program and published a new progress report in 2026. Work remains focused on technical readiness and industry consultation rather than a commitment to issue a digital yen.                                                                               | <p><b>2021:</b> PoC Phase 1.</p> <p><b>2022:</b> Phase 2.</p> <p><b>2023:</b> Pilot programme and CBDC Forum begin.</p> <p><b>2026:</b> Further system testing and pilot assessment reported.</p>                                                                                |
| <b>South Korea</b>   | <b>Institutional CBDC/deposit-token real-value pilot</b>  | Following Phase I real transactions in 2025, the Bank of Korea has been preparing Phase II of Project Hangang for H2 2026, expanding use cases and participants. The architecture combines institutional central-bank digital currency with tokenised commercial-bank deposits rather than issuing a | <p><b>2023:</b> Project Hangang announced.</p> <p><b>Apr–Jun 2025:</b> Phase I real-value experiment. <b>2026:</b> Phase II and public-sector payment experiments prepared.</p>                                                                                                  |

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|                  |                                                                      | general-purpose retail CBDC directly to the public.                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                   |
| <b>Singapore</b> | <b>Advanced wholesale CBDC experimentation</b>                       | MAS completed a live 2025 trial settling interbank overnight lending using wholesale CBDC on the SGD Test Network. The programme is being extended towards tokenised securities settlement, while BLOOM explores a broader ecosystem of regulated tokenised bank money and stablecoins. | <p><b>2016–20:</b> Project Ubin.</p> <p><b>2021–22:</b> Dunbar and other cross-border experiments.</p> <p><b>2025:</b> First live SGD wCBDC issuance in interbank trial.</p> <p><b>2026:</b> Further tokenised-settlement work.</p>               |
| <b>Thailand</b>  | <b>Retail pilot completed; wholesale/cross-border work continues</b> | The Bank of Thailand has no immediate plan to issue a retail CBDC following its pilot, but continues wholesale CBDC work, including mBridge and earlier Inthanon experiments.                                                                                                           | <p><b>2018:</b> Project Inthanon begins.</p> <p><b>2020–22:</b> Inthanon-LionRock evolves into mBridge.</p> <p><b>2022–23:</b> Retail CBDC real-value pilot.</p> <p><b>2024:</b> BOT concludes retail pilot and rules out immediate issuance.</p> |
| <b>Indonesia</b> | <b>Wholesale CBDC development / PoC completed</b>                    | Project Garuda is proceeding incrementally. Bank Indonesia completed the first wholesale Digital Rupiah PoC in 2024, testing issuance, redemption and transfer on two DLT platforms; later phases are intended to broaden                                                               | <p><b>2022:</b> Project Garuda white paper.</p> <p><b>2023:</b> Wholesale design consultation.</p> <p><b>2023–24:</b> Immediate-state PoC.</p>                                                                                                    |

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|                             |                                                                        | functionality before any implementation decision.                                                                                                                                                                                                                                           | <b>Dec 2024:</b> PoC report released; further stages remain under exploration.                                                                                                                                                                                     |
| <b>United Arab Emirates</b> | <b>Implementation / limited live use; wider rollout in development</b> | The Digital Dirham has moved beyond purely simulated testing. It has legal-tender status, has been used in cross-border and government transactions, and the CBUAE has developed a wallet while continuing the second implementation phase covering retail, wholesale and cross-border use. | <b>2023:</b> CBDC strategy launched.<br><b>Jan 2024:</b> First Digital Dirham issued for mBridge transaction; retail pilot conducted.<br><b>2025:</b> First live government transaction and wallet development.<br><b>2026:</b> Phase II implementation continues. |
| <b>South Africa</b>         | <b>Retail deprioritised; wholesale exploration continuing</b>          | In late 2025, the SARB concluded that although a retail CBDC is technically feasible, there is no compelling immediate need to introduce one. It is prioritising payment-system modernisation while shifting CBDC attention towards wholesale applications.                                 | <b>2018:</b> Project Khokha.<br><b>2022:</b> Khokha 2 tests wCBDC, tokenised securities and private settlement tokens.<br><b>2025:</b> SARB decides against immediate retail CBDC implementation.                                                                  |
| <b>Israel</b>               | <b>Advanced design and assessment; no issuance decision</b>            | The Bank of Israel continued detailed design and cost-benefit work through 2025 and is using 2026 to develop a possible issuance roadmap, prioritise features and prepare a recommendation to the                                                                                           | <b>2018:</b> Formal CBDC examination.<br><b>2022:</b> DLT experiment.<br><b>2024:</b> Logical architecture published.                                                                                                                                              |

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|              |                                      | Governor. No decision to issue has yet been taken.                                                                                                                                                                                                                                  | <p><b>2025:</b> Preliminary digital-shekel design released.</p> <p><b>2026:</b> Detailed assessment and issuance-roadmap work.</p>                                                                                                            |
| Saudi Arabia | Wholesale cross-border exploration / | Saudi Arabia's CBDC work remains centred on wholesale settlement. SAMA joined the mBridge MVP platform in 2024 after earlier bilateral experimentation with the UAE under Project Aber.                                                                                             | <p><b>2019–20:</b> Project Aber with UAE.</p> <p><b>2024:</b> SAMA joins mBridge MVP.</p> <p><b>Current:</b> Wholesale and cross-border feasibility remains the main focus.</p> <p><b>2025:</b> Exited mBridge</p>                            |
| Qatar        | Wholesale CBDC proof of concept      | The Qatar Central Bank's initial programme examines wholesale settlement and digital government-bond issuance. Its published description specifies that the first phase uses simulated funds rather than real money; it should therefore be distinguished from a live CBDC rollout. | <p><b>2024:</b> Wholesale CBDC programme and initial simulation phase announced, with completion originally scheduled before year-end.</p> <p><b>Subsequent phases:</b> Further implementation depends on assessment of the initial work.</p> |

| Account Information |              | Transaction Details |        | Payment Information |                |
|---------------------|--------------|---------------------|--------|---------------------|----------------|
| Account ID          | Account Name | Transaction ID      | Amount | Payment Method      | Payment Status |
| 123456789           | John Doe     | TXN001              | 100.00 | Credit Card         | Completed      |
| 123456789           | John Doe     | TXN002              | 50.00  | Bank Transfer       | Pending        |
| 123456789           | John Doe     | TXN003              | 25.00  | Credit Card         | Completed      |
| 123456789           | John Doe     | TXN004              | 75.00  | Bank Transfer       | Pending        |
| 123456789           | John Doe     | TXN005              | 150.00 | Credit Card         | Completed      |
| 123456789           | John Doe     | TXN006              | 30.00  | Bank Transfer       | Pending        |
| 123456789           | John Doe     | TXN007              | 120.00 | Credit Card         | Completed      |
| 123456789           | John Doe     | TXN008              | 40.00  | Bank Transfer       | Pending        |
| 123456789           | John Doe     | TXN009              | 90.00  | Credit Card         | Completed      |
| 123456789           | John Doe     | TXN010              | 60.00  | Bank Transfer       | Pending        |