

## BIS Papers

No 147

Embracing diversity, advancing together – results of the 2023 BIS survey on central bank digital currencies and crypto

by Alberto Di Iorio, Anneke Kosse and Ilaria Mattei

Monetary and Economic Department

June 2024

JEL classification: E42, E58, O33.

Keywords: central bank digital currencies, CBDC, digital innovation, cryptoassets, stablecoins, cross-border payments, interoperability, financial stability, regulation.

The views expressed are those of the authors and not necessarily the views of the BIS.

This publication is available on the BIS website ([www.bis.org](http://www.bis.org)).

© *Bank for International Settlements 2024. All rights reserved. Brief excerpts may be reproduced or translated provided the source is stated.*

ISSN 1682-7651 (online)  
ISBN 978-92-9259-770-2 (online)

# Embracing diversity, advancing together – results of the 2023 BIS survey on central bank digital currencies and crypto<sup>1</sup>

*Ninety-four percent of surveyed central banks are exploring a central bank digital currency (CBDC). The survey suggests that central banks are proceeding at their own speed, taking diverse approaches and considering different design features. Over the course of 2023, there has been a sharp uptick in experiments and pilots with wholesale CBDCs – mainly in advanced economies (AEs), but various emerging market and developing economies (EMDE) also stepped up their wholesale CBDC work. Overall, the likelihood that central banks will issue a wholesale CBDC within the next six years now exceeds the likelihood that they will issue a retail CBDC. Central banks further enhanced their engagement with stakeholders to inform CBDC design. Many CBDC features are still undecided. Yet, interoperability and programmability are often considered for wholesale CBDCs. For retail CBDCs, more than half of central banks are considering holding limits, interoperability, offline options and zero remuneration. Differences exist between AEs and EMDEs, for example with respect to the potential use of a distributed ledger and transaction limits. On crypto, the survey indicates that, to date, stablecoins are rarely used for payments outside the crypto ecosystem. Moreover, about two out of three responding jurisdictions have or are working on a framework to regulate stablecoins and other cryptoassets.*

## Introduction

This paper presents the results of the 2023 BIS survey on central bank digital currencies (CBDCs) and crypto. A total of 86 central banks participated and shared insights into their involvement in CBDC work, as well as their motivations and intentions for potentially issuing one. The paper also provides insight into the use of stablecoins for payments and regulatory approaches to cryptoassets across the globe.

CBDC is defined as a new form of digital money, denominated in the national unit of account, that is a direct liability of the central bank (BIS (2021)). If the CBDC is intended for use by households and firms for everyday transactions, it is referred to as a retail CBDC. A retail CBDC differs from existing forms of cashless payment instruments, such as credit transfers, direct debits, card payments and e-money, as it represents a direct claim on a central bank rather than a liability of a private financial institution. In contrast to a retail CBDC, a wholesale CBDC targets a different group of end users. Wholesale CBDCs are meant for use in transactions between banks, central banks and other financial institutions, so wholesale CBDCs would serve a similar role as today's reserves or settlement balances held at central banks. However, wholesale CBDCs could allow financial institutions to access new functionalities enabled by tokenisation, such as composability and programmability (BIS (2023a)). The results presented in this paper shed light on the current status of and latest trends

<sup>1</sup> We thank Jon Frost, Tirupam Goel and Tara Rice for their valuable comments and Amela Memetaj for excellent research assistance. The views expressed in this paper are those of the authors and do not necessarily reflect those of the BIS.

in central banks' work on retail and wholesale CBDCs and their plans to potentially issue one.

Cryptoassets are defined as digital assets issued by the private sector that depend primarily on cryptography and distributed ledger or similar technology (FSB (2020)). In contrast to CBDCs, cryptoassets do not represent a claim on a central bank. As the prices of cryptoassets fluctuate constantly and abruptly, the concept of a stablecoin was created (G7 (2019)). Stablecoins are a subcategory of cryptoassets that aim to maintain a stable value relative to a specified peg (FSB (2020)). At the end of May 2024, the total market capitalisation of cryptoassets amounted to \$2.7 trillion.<sup>2</sup> Stablecoins constituted a relatively small proportion (6%) of this market, with a market capitalisation of \$161 billion.<sup>3</sup>

Given their claim to provide a stable alternative to other cryptoassets, stablecoins have a greater potential to become a widely used method of payment. Over the course of 2023, various banks and other traditional payment service providers started to use stablecoins for their activities or to issue stablecoins to their customers. For example, in April 2023, Société Générale launched the euro-denominated stablecoin EUR CoinVertible to their clients for the settlement of on-chain securities. In August 2023, PayPal launched a USD-based stablecoin (PYUSD) with Paxos. In addition, in September 2023, Visa announced it was expanding its stablecoin settlement capabilities with USD Coin (USDC) issued by Circle to merchant acquirers.<sup>4</sup> These initiatives show that stablecoins are no longer the sole domain of cryptoasset providers and may boost the uptake of stablecoins for payments outside the crypto ecosystem. If not properly designed and regulated, the large-scale use of stablecoins for payments could have serious implications for the safety and efficiency of payment ecosystems.

## Key features of the 2023 survey

### Questions

The latest CBDC and crypto survey was carried out in late 2023 for the seventh consecutive year (see Annex A for the questionnaire).<sup>5</sup> Most of the previous years' questions remained unchanged to ensure consistency. The survey asked central banks about their engagement in the development of a retail, wholesale or both types of CBDC and, if working on these, how advanced the work was. Motivations and

<sup>2</sup> The first cryptoasset was Bitcoin, which has remained the biggest and best-known cryptoasset. Its market capitalisation and price reached an all-time high in March 2024, as values exceeded \$1.4 billion and \$73,000, respectively.

<sup>3</sup> The largest stablecoin at the end of May 2024 was Tether, which accounted for 69% of the total stablecoin market capitalisation, followed at a distance by USDC (20%) and DAI (3%).

<sup>4</sup> Further details on EUR CoinVertible can be found at [www.sgforge.com/societe-generale-forge-launches-coinvertible-the-first-institutional-stablecoin-deployed-on-a-public-blockchain](http://www.sgforge.com/societe-generale-forge-launches-coinvertible-the-first-institutional-stablecoin-deployed-on-a-public-blockchain). For information on PYUSD, see [paxos.com/2023/08/07/paypal-launches-us-dollar-backed-stablecoin](https://paxos.com/2023/08/07/paypal-launches-us-dollar-backed-stablecoin), and for further details on Visa's stablecoin settlement capabilities with USDC, see [usa.visa.com/about-visa/newsroom/press-releases.releaseld.19881.html](https://usa.visa.com/about-visa/newsroom/press-releases.releaseld.19881.html).

<sup>5</sup> The latest survey was carried out between October 2023 and January 2024. The first survey informed a CPI and Markets Committee report on CBDCs published in March 2018 (CPMI-MC (2018)). The consecutive surveys were published as BIS papers between 2019 and 2023 (Barontini and Holden (2019), Boar et al (2020), Boar and Wehrli (2021), Kosse and Mattei (2022), Kosse and Mattei (2023)).

current expectations for potentially issuing a CBDC were also investigated. A few new questions were added to learn more about envisioned use cases and design features.

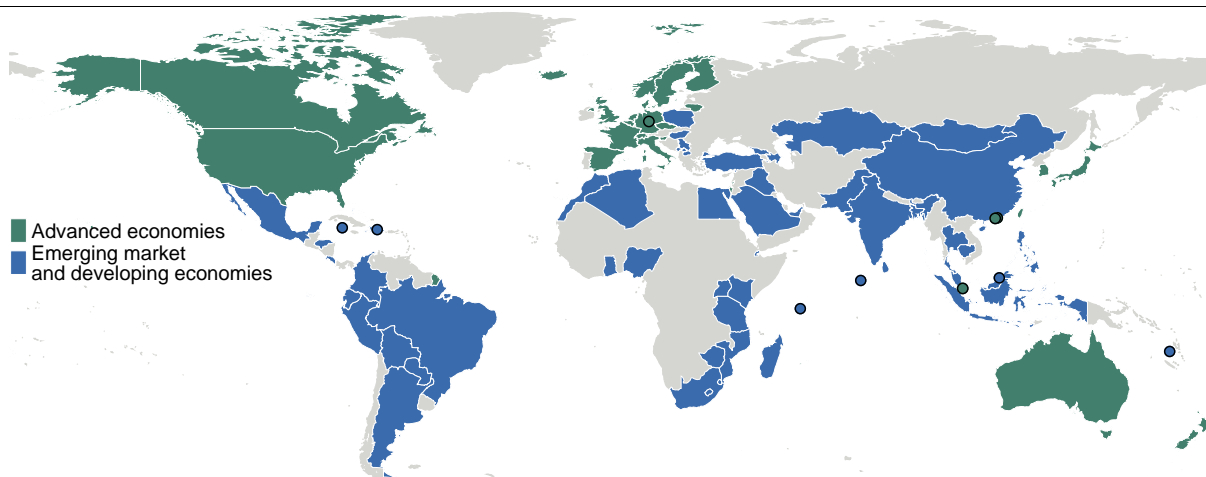
As in previous editions, the survey included questions about cryptoassets and stablecoins. In particular, questions were asked about the use of stablecoins in payments outside the crypto ecosystem and regulatory approaches to cryptoassets.

## Sample and geographical coverage

Eighty-six central banks replied to the 2023 survey (see Annex B), of which 74 had also taken part in the 2022 survey.<sup>6</sup> Moreover, 38 central banks participated for the sixth year in a row. The jurisdictions of the responding central banks represent 81% of the world's population and 94% of global economic output. Twenty-eight respondents are central banks from advanced economies (AEs) and 58 are central banks from emerging market and developing economies (EMDEs) (Graph 1).

Respondents to the 2023 survey

Graph 1



The black circles represent the Cayman Islands, the Dominican Republic, the European Central Bank, Fiji, Hong Kong SAR, Macao SAR, Seychelles and Singapore. The categorisation of jurisdictions into advanced economies (AEs) and emerging market and developing economies (EMDEs) is based on the World Economic Outlook classification of the International Monetary Fund (IMF).

The use of this map does not constitute, and should not be construed as constituting, an expression of a position by the BIS regarding the legal status or sovereignty of any territory or its authorities, the delimitation of international frontiers and boundaries and/or the name and designation of any territory, city or area.

Source: 2023 BIS central bank survey on CBDCs and crypto.

## Central banks are intensifying their work on wholesale CBDCs

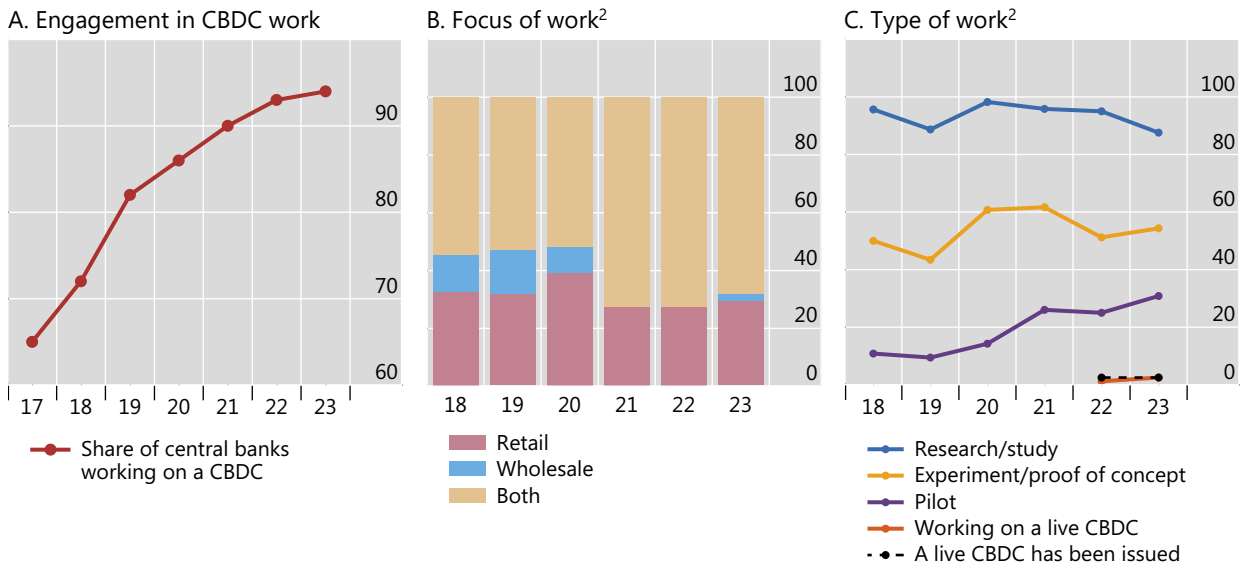
Central banks' involvement in CBDCs was already high in 2022 and remained largely constant: at the end of 2023, 94% of responding central banks were engaged in CBDC work (Graph 2.A). Most central banks are working on both retail and wholesale CBDCs,

<sup>6</sup> The number of central banks replying to the survey in previous years was 86 (2022), 81 (2021), 65 (2020), 66 (2019), 63 (2018) and 52 (2017).

## Central bank involvement in CBDC work advances further<sup>1</sup>

As a percentage of respondents

Graph 2



<sup>1</sup> Based on responses to the survey. Therefore, the results do not necessarily match with actual CBDC issuance as reported in other sources such as the database from Auer et al (2020), the CBDC Tracker at [cbdctracker.org](http://cbdctracker.org) from Mikhalev et al (2021) and the CBDC Tracker from the Atlantic Council at [www.atlanticcouncil.org/cbdctracker](http://www.atlanticcouncil.org/cbdctracker). <sup>2</sup> Share of respondents conducting work on CBDCs.

Sources: BIS central bank surveys on CBDCs and crypto, 2017–23; authors' calculations.

though not all (Graph 2.B).<sup>7</sup> Around 30% of central banks focus on retail CBDCs only and 2% are working on wholesale CBDCs only. More than half of the respondents (54%) are experimenting with proofs of concept and one out of three (31%) are running a pilot (Graph 2.C).

Throughout 2023, both retail and wholesale CBDC work progressed to more advanced stages. Nevertheless, central banks are taking different approaches and proceeding at varying speeds. For example, there has been a sharp uptick in experiments and pilots in AEs, in particular with wholesale CBDCs (Graph 3.B). The share of AE central banks running proofs of concept (81%) or pilots (33%) rose steeply (from 60% and 10%, respectively). The share of EMDE central banks working on a wholesale CBDC proof of concept (39%) or pilot (19%) also grew, though less significantly (from 37% and 16%, respectively). Examples of central banks that recently started to work on a pilot for wholesale CBDCs include the Bangko Sentral ng Pilipinas (Project Agila), the Swiss National Bank (SNB) (Project Helvetia Phase III), the Monetary Authority of Singapore (MAS), the European Central Bank (ECB) and the South African Reserve Bank.<sup>8</sup>

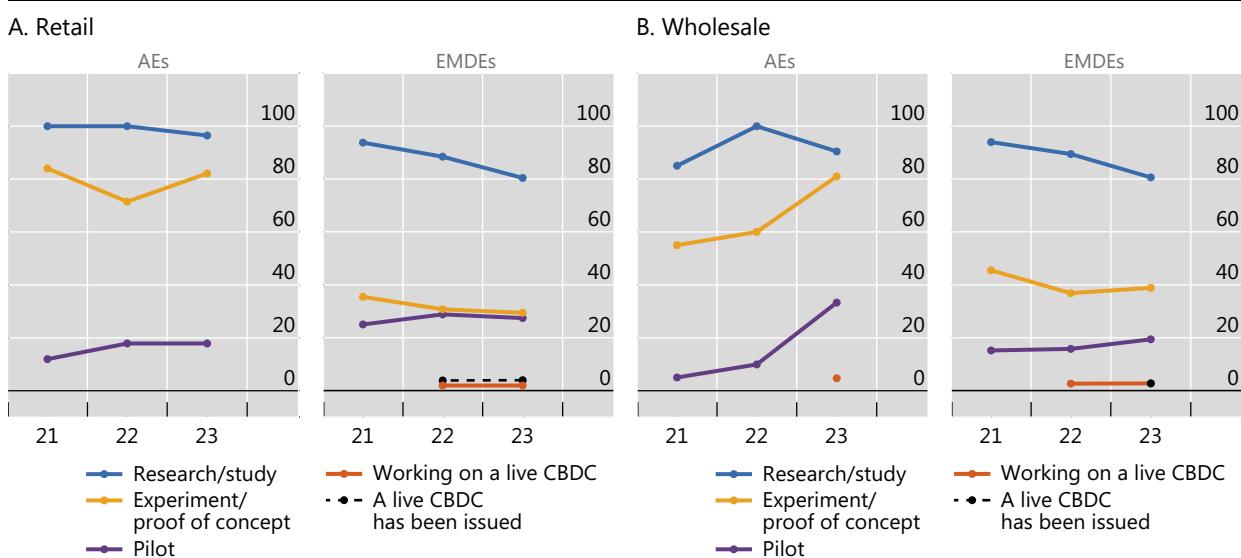
<sup>7</sup> In more than half of the cases, central banks' retail CBDC and wholesale CBDC work are separate projects, while more than one third of the respondents said that their retail and wholesale CBDC work are part of the same project.

<sup>8</sup> For the announcement of Project Agila, see [www.centralbanking.com/central-banks/currency/7960963/bsp-says-it-will-complete-wholesale-cbdc-pilot-this-year](http://www.centralbanking.com/central-banks/currency/7960963/bsp-says-it-will-complete-wholesale-cbdc-pilot-this-year). For Project Helvetia Phase III, see the announcement available at [www.snb.ch/en/publications/communication/press-releases/2023/pre\\_20231102](http://www.snb.ch/en/publications/communication/press-releases/2023/pre_20231102). For the wholesale

## Type of CBDC work by country group<sup>1</sup>

As a percentage of respondents conducting work on CBDCs

Graph 3



<sup>1</sup> Based on responses to the survey. Therefore, the results do not necessarily match with actual CBDC issuance as reported in other sources such as the database from Auer et al (2020), the CBDC Tracker at [cbdctracker.org](http://cbdctracker.org) from Mikhalev et al (2021) and the CBDC Tracker from the Atlantic Council at [www.atlanticcouncil.org/cbdctracker](http://www.atlanticcouncil.org/cbdctracker).

Sources: BIS central bank surveys on CBDCs and crypto, 2021–23; authors' calculations.

Work on retail CBDCs also progressed differently across jurisdictions in 2023 (Graph 3.A). In particular, there has been a substantial increase in proofs of concept across AEs (from 71% to 82%). For example, the Governing Council of the ECB decided to move their work on a digital euro from the investigation phase to the preparation phase, which will involve testing and experimentation.<sup>9</sup> By contrast, the share of EMDE central banks running a proof of concept (29%) or pilot (27%) fell slightly (from 31% and 29%, respectively). The share of EMDE central banks having or working on a live retail CBDC remained constant. Yet, there are more retail CBDCs live or in the making in EMDEs than in AEs. In fact, all of the four retail CBDCs that are currently live have been issued in an EMDE – in The Bahamas, the Eastern Caribbean, Jamaica and Nigeria.<sup>10</sup> Also, 2% of EMDE central banks are now working on a live CBDC (versus 0% of AE central banks).

While an increasing number of central banks are experimenting or piloting a CBDC, many continue to also engage in research (88%) (Graph 2.C). For retail CBDC, one of the research areas of interest focuses on the uptake of a potential retail CBDC

CBDC pilot of the MAS, see the announcement available at [www.mas.gov.sg/news/speeches/2023/shaping-the-financial-ecosystem-of-the-future](http://www.mas.gov.sg/news/speeches/2023/shaping-the-financial-ecosystem-of-the-future). For the results of the first ECB experiment using new technologies for settlement in central bank money, see [www.ecb.europa.eu/press/intro/news/html/ecb.mipnews240514.en.html](http://www.ecb.europa.eu/press/intro/news/html/ecb.mipnews240514.en.html), and for the high-level action plans set out by the South African Reserve Bank, see South African Reserve Bank (2024).

<sup>9</sup> See the announcement available at [www.ecb.europa.eu/press/pr/date/2023/html/ecb.pr231018~111a014ae7.en.html](http://www.ecb.europa.eu/press/pr/date/2023/html/ecb.pr231018~111a014ae7.en.html).

<sup>10</sup> Based on an updated data set on CBDC projects, speeches and search interest, as of 1 March 2024, from Auer et al (2020). For the latest status of CBDC projects, see CBDC Tracker at [cbdctracker.org](http://cbdctracker.org) from Mikhalev et al (2021) and the CBDC Tracker from the Atlantic Council at [www.atlanticcouncil.org/cbdctracker](http://www.atlanticcouncil.org/cbdctracker).

among consumers.<sup>11</sup> Central banks have also been studying the implications of retail CBDC for monetary policy implementation and bank intermediation.<sup>12</sup> Research on wholesale CBDC has been looking into the role of central bank money as a settlement asset for transactions on distributed ledgers.<sup>13</sup>

### Central banks are exploring CBDCs for a variety of reasons

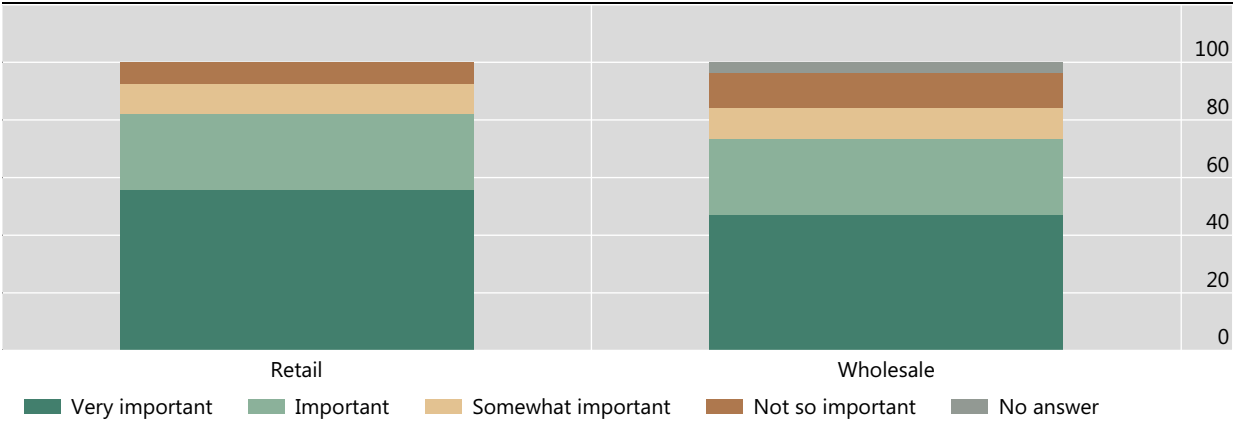
Preserving the role of central bank money is among the key drivers of the CBDC work for more than two thirds of respondents (Graph 4). Central banks mentioned that a retail CBDC could help ensure the singleness of money, which refers to the convertibility at par between different forms of money. Various central banks have raised concerns that this singleness of money may be threatened by the emergence of new forms of privately issued money.<sup>14</sup> Others reported that a wholesale CBDC would enforce the role of central bank money as a settlement asset in a tokenised ecosystem.<sup>15</sup>

Central banks are exploring CBDCs for other reasons as well, and there are some notable differences between retail and wholesale CBDCs. For retail CBDCs, much of

#### Importance of preserving the role of central bank money as a motivation

As a percentage of respondents conducting work on CBDCs, 2023

Graph 4



Sources: 2023 BIS central bank survey on CBDCs and crypto; authors' calculations.

<sup>11</sup> For instance, Choi et al (2023) study the potential uptake of a retail CBDC for Korea; Huynh et al (2020) and Li (2023) do so for Canada.  
<sup>12</sup> See for example Abad et al (2023) and references therein.  
<sup>13</sup> See for example Durfee et al (2023) for the United States and Neuhaus and Plooij (2023) for the euro area.  
<sup>14</sup> See Bank of England and HM Treasury (2024) and Brunnermeier and Landau (2022) for a discussion on how the digital pound and the digital euro, respectively, can help preserve the singleness of money.  
<sup>15</sup> See the speech by François Villeroy de Galhau, Governor of the Bank of France, at the conference "Unveiling the potential of wholesale CBDC: what insights and prospects?" in October 2023 (available at [www.bis.org/review/r240214e.htm](http://www.bis.org/review/r240214e.htm)) and the introductory remarks by Thomas Jordan, Chairman of the Governing Board of the Swiss National Bank, at the event "Towards the future monetary system" in April 2024 (available at [www.bis.org/review/r240409b.htm](http://www.bis.org/review/r240409b.htm)).



the work is driven by the aim to enhance domestic payments efficiency, for example by serving as a platform for further innovation, and to promote payments safety (Graph 5, top panel). Over the years, these two motivations have become equally important for AEs and EMDEs.

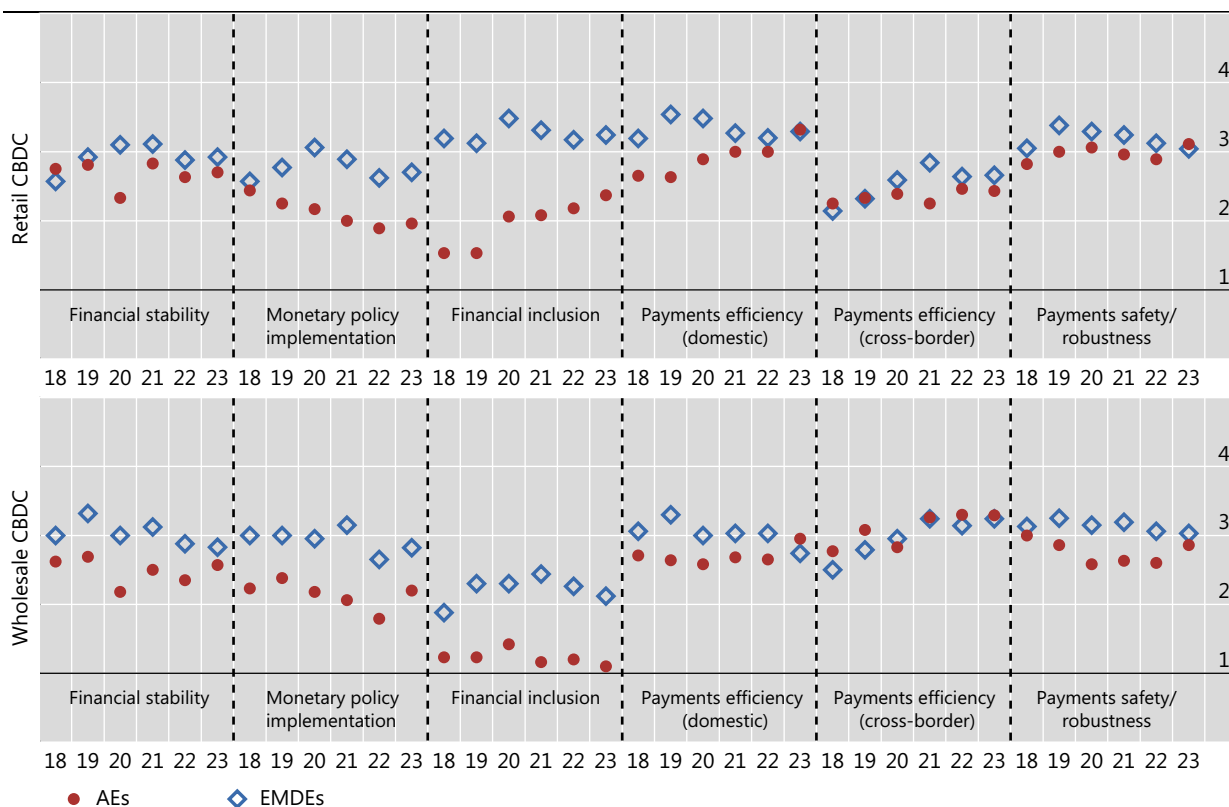
The importance of financial inclusion as a driver for retail CBDCs is also converging between AEs and EMDEs. While it is still a more important reason for EMDEs than for AEs, more AE central banks reported financial inclusion as one of their drivers than last year. In particular, various participating AE central banks reported that a retail CBDC can bring additional benefits in terms of access to digital financial services (often referred to as digital financial inclusion).<sup>16</sup>

As in previous years, work on wholesale CBDCs is driven mainly by the desire to enhance cross-border payments, in both AEs and EMDEs (Graph 5, bottom panel). In particular, some respondents mentioned that a wholesale CBDC could address the challenges that cross-border payments face today, such as high costs, low speed, limited access and insufficient transparency.<sup>17</sup> In contrast to the case of retail CBDCs,

### Motivations for issuing a retail and wholesale CBDC

Average importance, 1 (not so important)–4 (very important)

Graph 5



Sources: BIS central bank surveys on CBDCs and crypto, 2018–23; authors' calculations.

<sup>16</sup> See GPMI (2016) for a definition of digital financial inclusion, Cantú et al (2024) for a discussion on financial inclusion and financial health, and Khera et al (2021) for a discussion on a digital financial inclusion index based on payment data.

<sup>17</sup> See CPPI et al (2022) for a discussion on and implications of the options for access to and interoperability of CBDCs for cross-border payments.

financial inclusion is the least important motivation for central banks' exploration of wholesale CBDCs. However, some central banks, especially in EMDEs, do consider financial inclusion as part of their wholesale CBDC work, for example by exploring options to expand access to central bank money for non-bank payment service providers.

## Medium-term issuance is more likely for wholesale than for retail CBDC

As central banks expanded their work on wholesale CBDCs, they also adjusted their expectations for when to possibly issue one. Overall, central banks expect to launch a little later than they expected to last year. In particular, while fewer respondents expect to issue a wholesale CBDC in the short term, slightly more (22%, up from 17% last year) are now likely to do so in the medium term. Also, fewer central banks (38%, down from 44%) said they would be unlikely to issue in the medium term (Graph 6.B).

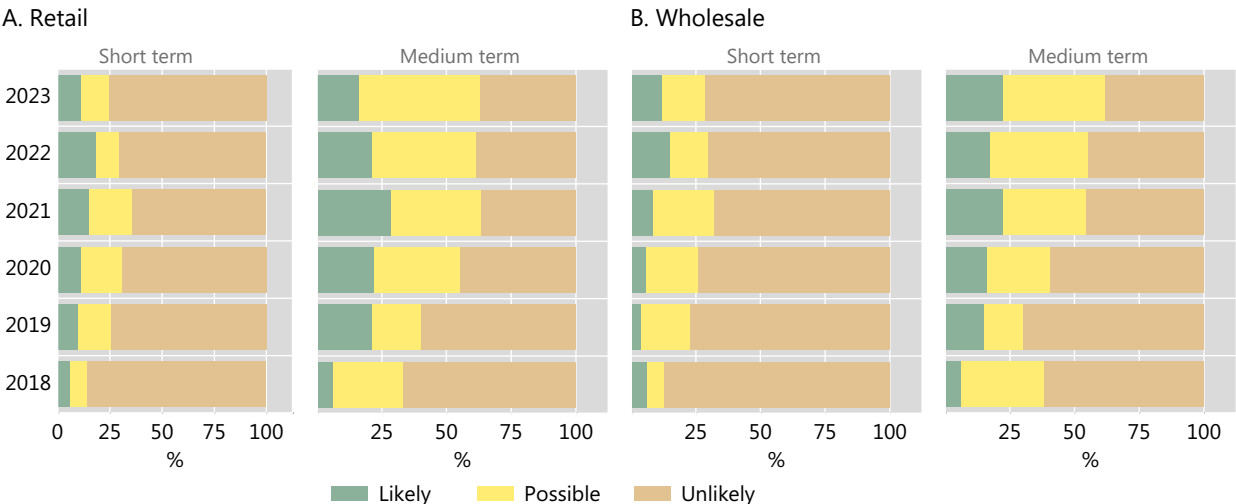
Expectations for the timing of the introduction of a potential wholesale CBDC differ between AE and EMDE central banks. In line with the surge of wholesale experiments and pilots in AEs, AE central banks generally consider themselves more likely than do those of EMDEs to issue one in the short term (19% compared with 9%, respectively).

Compared with last year, slightly fewer central banks consider it likely that they will issue a retail CBDC within the next three years (12%, down from 18%) or within four and six years (16%, down from 21%) (Graph 6.A). This decrease is mainly driven by an adjustment of expectations among EMDE central banks. In addition, more central banks – in both EMDEs and AEs – indicated that short- or medium-term

### Likelihood of issuing a CBDC in the foreseeable future<sup>1</sup>

As a percentage of respondents that have not issued a CBDC

Graph 6



<sup>1</sup> Short term: 1–3 years; Medium term: 4–6 years. "Likely" combines "very likely" and "somewhat likely". "Unlikely" combines "very unlikely" and "somewhat unlikely". Euro area included as an aggregate figure. The sample includes only central banks that have replied to the question.

Sources: BIS central bank surveys on CBDCs and crypto, 2018–23; authors' calculations.

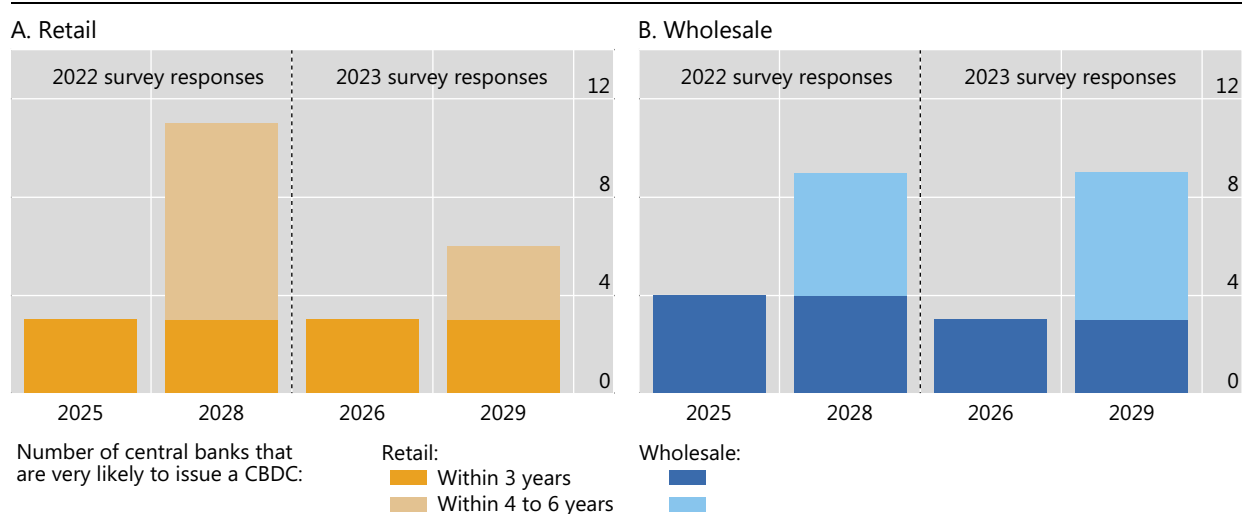
issuance could be a possibility, which can be interpreted as an increased degree of uncertainty. As in previous years, the likelihood of issuing a retail CBDC is generally greater for EMDE central banks than for AE central banks.<sup>18</sup>

In sum, the likelihood that a wholesale CBDC will be issued within the next six years is now greater than that for retail. Based on the number of central banks that indicated that they would be very likely to start issuing a CBDC over the next few years, there could be six additional retail and nine wholesale CBDCs publicly circulating towards the end of this decade (Graph 7). In line with the downward-adjusted expectations for retail CBDC issuance, this is fewer retail CBDCs than were predicted last year.

Possible number of additional live CBDCs based on stated likelihood of issuance<sup>1</sup>

Cumulative count

Graph 7



<sup>1</sup> The estimated number of CBDCs in 2025/2026 and 2028/2029 is determined based on the number of central banks indicating that the issuance of a retail or wholesale CBDC was very likely in the short term and medium term respectively. Euro area included as an aggregate figure.

Sources: BIS central bank surveys on CBDCs and crypto, 2022–23; authors' calculations.

## Likely retail CBDC features: limits on holdings, domestic interoperability, offline functionality and non-remuneration

As work on CBDCs is progressing, central banks are shaping their ideas about their potential retail CBDC. More than two thirds of respondents consider a (potential) retail CBDC that is subject to holding limits (AEs: 68%; EMDEs: 63%) (Graph 8.B) is interoperable with their domestic payment systems (AEs: 75%; EMDEs: 78%)

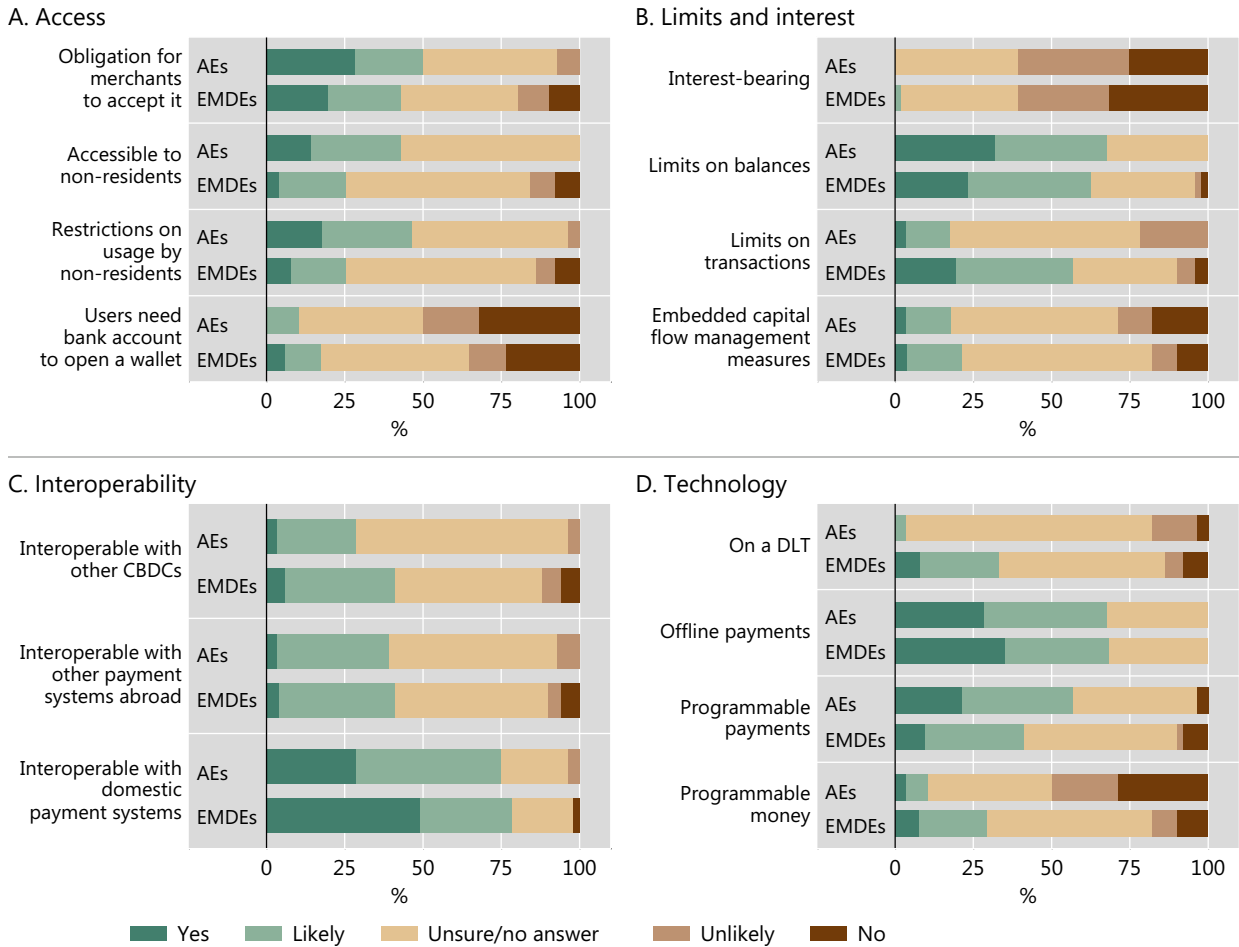
<sup>18</sup> The share of EMDE central banks that consider it likely they will issue a retail CBDC in the short and medium term was 15% and 17%, respectively. The share of AE central banks considering it likely they will issue a retail CBDC in the short and medium term was 0% and 12%, respectively.

(Graph 8.C) and enables offline payments (AEs: 68%; EMDEs: 69%) (Graph 8.D).<sup>19</sup> Also, 50% of AEs and 35% of EMDEs consider a retail CBDC that can be used without a bank account, and 50% of AEs and 43% of EMDEs may require merchants to accept it (Graph 8.A).<sup>20</sup>

## Design features of a (potential) retail CBDC<sup>1</sup>

As a percentage of respondents conducting work on retail CBDCs, 2023

Graph 8



<sup>1</sup> Euro area included as an aggregate figure.

Sources: 2023 BIS central bank survey on CBDCs and crypto; authors' calculations.

<sup>19</sup> The use of a retail CBDC as a store of value may have an impact on commercial banks' and central banks' balance sheets. To mitigate this, some jurisdictions are considering limits. For instance, Bindseil (2020), Bindseil and Panetta (2020) and Meller and Soons (2023) propose or assume a holding threshold of €3,000 for the digital euro. For a potential digital pound, the Bank of England proposed a limit between £10,000 and £20,000 (Cunliffe (2023)), while the majority of commercial banks favoured limits between £3,000 and £5,000, citing the risk of deposit outflows (BoE and HM Treasury (2024)). For more information on the offline functioning of retail CBDCs and the challenges that offline CBDC payments may present, see BIS Innovation Hub (2023) and Sveriges Riksbank (2024).

<sup>20</sup> Some central banks reported possible exemptions for small merchants, while others underlined that legal tender status does not imply mandatory acceptance in their jurisdiction.

Another often-discussed feature in the context of retail CBDCs is remuneration. More than one in two central banks does not intend to pay interest on a potential retail CBDC (Graph 8.B). However, not all central banks exclude this feature a priori. For example, the Bank of Israel announced that its potential retail CBDC may have the option of bearing interest (Bank of Israel (2024)).

AEs and EMDEs not only differ in terms of the type and status of their CBDC work; they are also contemplating different designs. There are four key differences. More EMDE central banks are likely to issue a retail CBDC on a distributed ledger than AE central banks (Graph 8.D). This may reflect their willingness to leapfrog moving from legacy systems to cutting-edge technologies. Also, EMDEs seem more likely than AEs to have a CBDC that can be programmed for specific purposes (programmable money) (Graph 8.D).<sup>21</sup> EMDE central banks also seem more likely to impose transaction limits than AE central banks (Graph 8.B). This may be due to challenges related to conducting know-your-customer (KYC) procedures when users lack adequate documentation.<sup>22</sup> For instance, in Nigeria, individuals have the option to open an eNaira wallet without a bank account using basic information such as a photo and telephone number. However, such a wallet is subject to relatively low daily transaction limits (Lannquist and Tan (2023)). Another notable difference is that AE central banks are generally more likely to consider a retail CBDC that can also be used by non-residents, subject to restrictions (Graph 8.A).

Yet, many retail CBDC features are still undecided, in both EMDEs and AEs. For example, more than half of central banks are uncertain about whether their potential retail CBDC would be interoperable with other CBDCs and payment systems abroad. Also, most central banks have yet to decide whether to embed capital flow management measures.

## Interoperability is top of central banks' mind for wholesale CBDCs

Many central banks plan to make their (potential) wholesale CBDC interoperable. Around two out of three central banks are likely to establish interoperability with their other domestic payment systems (AEs: 69%; EMDEs 58%) (Graph 9.C). Cross-border interoperability is also considered, though less often than domestic interoperability. Moreover, notable country differences exist: in particular EMDE central banks are considering a wholesale CBDC that is interoperable with CBDCs of other jurisdictions (AEs: 31%; EMDEs: 53%) and with other payment systems across borders (AEs: 23%; EMDEs: 53%). A significant number of central banks also envisage a potential wholesale CBDC that allows for programmable payments (AEs: 62%; EMDEs: 39%) and

<sup>21</sup> The ECB defines programmable money as “a digital form of money used for a predefined purpose, like a voucher, with limitations on where, when or with whom people can use it”. See ECB, “FAQ on a digital euro”, 14 February 2024, [www.ecb.europa.eu/euro/digital\\_euro/faqs/html/ecb.faq\\_digital\\_euro.en.html](http://www.ecb.europa.eu/euro/digital_euro/faqs/html/ecb.faq_digital_euro.en.html). Related to this, the MAS proposed the concept of purpose bound money (PBM), which allows users to specify the conditions for the use of digital money without requiring money itself to be programmed (MAS (2023a)).

<sup>22</sup> Research from the World Bank has shown that “27% of the unbanked reported lacking the documentation needed to open an account. Unbanked adults were more likely to cite these barriers in economies such as Colombia (43%), Tanzania (50%) and Uganda (50%)” (Demirgüç-Kunt et al (2022)).

that is based on distributed ledger technology (DLT) (AEs: 39%; EMDEs: 42%) (Graph 9.D).

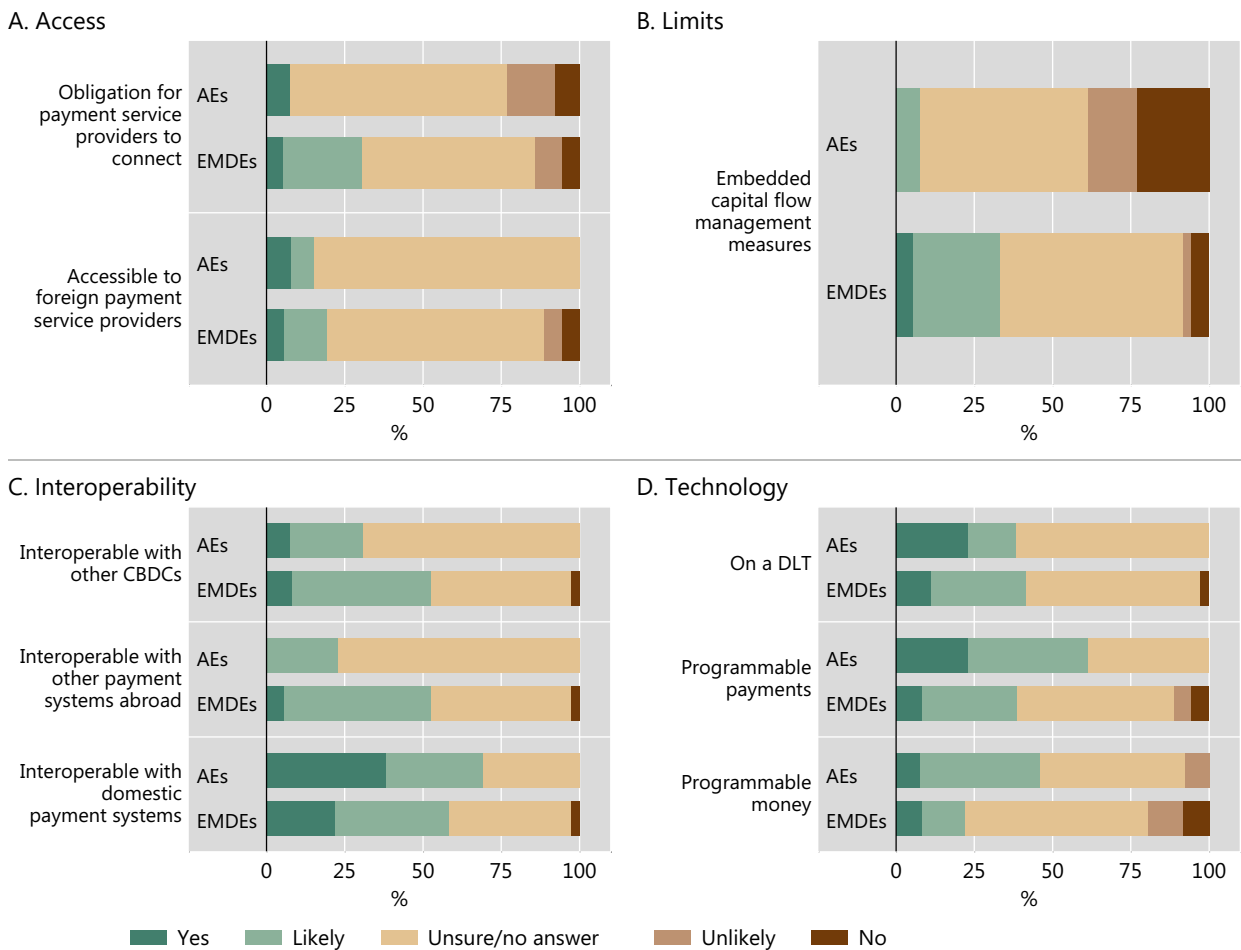
AEs and EMDEs have different perspectives also on a variety of other wholesale CBDC design features. Central banks in EMDEs consider the mandatory participation of payment service providers more often than do those in AEs. Such mandatory participation may be considered to foster financial inclusion.<sup>23</sup> Also, EMDE central banks are more likely to implement capital flow management measures (Graph 9.B). By contrast, AEs are more likely than EMDEs to offer a wholesale CBDC that can be programmed for specific purposes (programmable money).

Yet, like with retail CBDC, many design choices are yet to be made. In particular, central banks of both AEs and EMDEs are highly uncertain about making their wholesale CBDC accessible to foreign payment service providers (Graph 9.A).

### Design features of a (potential) wholesale CBDC<sup>1</sup>

As a percentage of respondents conducting work on wholesale CBDCs, 2023

Graph 9



<sup>1</sup> Euro area included as an aggregate figure.

Sources: 2023 BIS central bank survey on CBDCs and crypto; authors' calculations.

<sup>23</sup> Further internal analysis suggests that central banks working on a wholesale CBDC for – among others – financial inclusion-related motivations more often indicated that they consider the mandatory participation of payment service providers.

## Central banks envisage a variety of use cases for their potential CBDCs

The intended use cases differ remarkably between retail and wholesale CBDCs (Graph 10). For retail, more than two out of three central banks that answered the question on potential use cases are targeting person-to-person payments (71%) and government payments (67%), and about half envision a retail CBDC that can be used for online payments (52%) and point-of-sale purchases (49%) (Graph 10.A).<sup>24</sup> For example, the retail CBDC pilot in India that was launched at the end of 2022 enabled person-to-person and person-to-business payments using a digital rupee (Reserve Bank of India (2024)). Similarly, the ECB is investigating online and offline person-to-person, point-of-sale and e-commerce payments for its potential digital euro (ECB (2023) and Cipollone (2024)). Far fewer central banks anticipate that their potential retail CBDC will be used for payments between companies (12%) or for cross-border payments (6%).

The two most often mentioned use cases for wholesale CBDCs are settlement of interbank payments (46%) and delivery versus payment (50%). Some central banks also consider a potential wholesale CBDC for foreign exchange transactions (24%) or payment-versus-payment transactions (17%) (Graph 10.B). This aligns with the use cases explored in various proofs of concept, experiments and pilots. For example, the BIS Innovation Hub’s Project Mariana demonstrated the technical feasibility of automated market-makers for trading and settlement of wholesale CBDCs, and the SNB launched a pilot project (Helvetia Phase III) to issue wholesale CBDC for

### Envisioned use cases for a (potential) CBDC

Count<sup>1</sup>

Graph 10

#### A. Retail



#### B. Wholesale



<sup>1</sup> Based on answers to open question “What use cases do you envision or consider for your (potential) retail/wholesale CBDC?”. A total of 66 and 46 central banks answered the question for retail CBDC and wholesale CBDC, respectively. Answers have been summarised into key words. The larger the font, the more often the use case was mentioned. Size should not be compared across panels but rather only within each panel.

Sources: 2023 BIS central bank survey on CBDCs and crypto; authors’ calculations.

<sup>24</sup> Government payments refer to transactions both from and to government agencies and could include tax payments, pensions and government salaries.

settlement of bond transactions.<sup>25</sup> Similarly, the MAS piloted the live issuance of a wholesale CBDC to settle payments across commercial banks.<sup>26</sup>

## Central banks are further enhancing their involvement of stakeholders

Over the course of 2023, central banks have further enhanced their stakeholder involvement to inform the design of their potential CBDCs. The degree of engagement and the types of entities with which central banks are working or dialoguing differ between wholesale and retail CBDCs and between AEs and EMDEs.

For retail CBDCs, the engagement of stakeholders is more common in AEs than in EMDEs. Nevertheless, it increased universally and across all entity types. Both AE and EMDE central banks mainly engaged or worked with their governments and/or other public authorities, external technology providers and other private sector entities, such as commercial banks (Graph 11, top panel). For instance, the Bank of Japan set up a “CBDC Forum” with firms from the private sector to discuss the development of a potential digital yen.<sup>27</sup> Also, the National Bank of Georgia recently selected a technology firm for its digital GEL project.<sup>28</sup>

For wholesale CBDCs, there are a few notable differences between EMDEs and AEs. In EMDEs, there has been a particularly strong increase in collaboration with other central banks to inform domestic design choices, as well as with other public entities (Graph 11, bottom panel). One example is the Central Bank of Brazil, which selected both private and public entities to participate in the Drex pilot.<sup>29</sup> AE central banks also increased their cooperation with other entities, such as third-party tech providers and other private entities. For example, the MAS is working with the industry to test the technical feasibility of and infrastructure for a possible digital Singapore dollar, and the Hong Kong Monetary Authority announced it would set up a wholesale CBDC architecture community consisting of experts from a range of disciplines, including banks, cryptoasset service providers, technology companies and academia. Similarly, Project Agorá, which was recently launched by the BIS Innovation Hub, seven central banks and a group of private financial firms convened by the Institute of International Finance (IFF), will explore how tokenised commercial bank deposits can be integrated with tokenised wholesale central bank money.<sup>30</sup>

To date, the involvement of end users is relatively limited in both AEs and EMDEs. About 28% of central banks engage end users in their retail CBDC work and 18% do so for wholesale CBDC. There is no one-size-fits-all approach that guarantees the adoption of new payment instruments, but the necessary conditions include that they

<sup>25</sup> The announcement is available at [www.snb.ch/en/publications/communication/press-releases/2023/pre\\_20231102](https://www.snb.ch/en/publications/communication/press-releases/2023/pre_20231102).

<sup>26</sup> The announcement is available at [www.mas.gov.sg/news/speeches/2023/shaping-the-financial-ecosystem-of-the-future](https://www.mas.gov.sg/news/speeches/2023/shaping-the-financial-ecosystem-of-the-future).

<sup>27</sup> The announcement is available at [www.boj.or.jp/en/paym/digital/d\\_forum/dfo230720e.pdf](https://www.boj.or.jp/en/paym/digital/d_forum/dfo230720e.pdf).

<sup>28</sup> The announcement is available at [nbg.gov.ge/en/media/news/ripple-the-flagship-international-company-becomes-the-technology-partner-for-the-digital](https://nbg.gov.ge/en/media/news/ripple-the-flagship-international-company-becomes-the-technology-partner-for-the-digital).

<sup>29</sup> More details are available at [www.bcb.gov.br/estabilidadefinanceira/piloto-drex](https://www.bcb.gov.br/estabilidadefinanceira/piloto-drex).

<sup>30</sup> See MAS (2023b), [www.hkma.gov.hk/eng/news-and-media/press-releases/2024/03/20240307-5](https://www.hkma.gov.hk/eng/news-and-media/press-releases/2024/03/20240307-5) and [www.bis.org/about/bisih/topics/fmis/agora.htm](https://www.bis.org/about/bisih/topics/fmis/agora.htm).



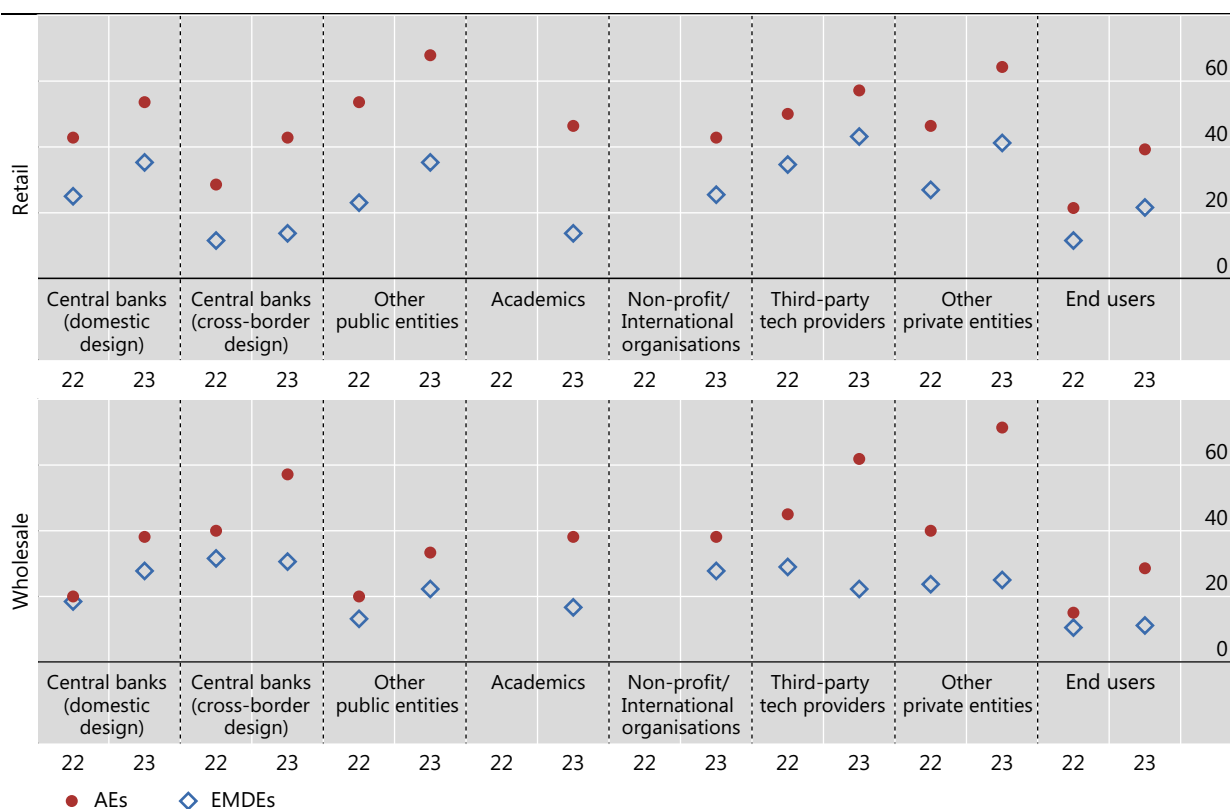
meet end user needs (Bank of Canada et al (2021), Frost et al (2024)) and that end users have an adequate level of financial literacy (CPMI and World Bank (2016)). This is also demonstrated by experiences from live CBDC use cases. Lessons learnt in the design and launch of eNaira in Nigeria, for instance, included the need to create awareness, elicit stakeholder buy-in and engage stakeholders early and frequently (Central Bank of Nigeria (2023)).

Central banks use different approaches to involve end users, including bilateral conversations, multilateral meetings and public consultations. For example, the Reserve Bank of New Zealand recently launched a public consultation on high-level design options for a potential CBDC called “digital cash”. The Bank of England and Bank of Canada published responses to their public consultations held in 2023 on a potential digital pound and digital Canadian dollar, respectively.<sup>31</sup>

### Entities engaged by central banks to inform CBDC design choices

As a percentage of respondents engaged in work on the respective CBDC

Graph 11



Sources: BIS central bank surveys on CBDCs and crypto, 2022–23; authors’ calculations.

<sup>31</sup> For more information, see Reserve Bank of New Zealand (2024), BoE and HM Treasury (2024) and Bank of Canada (2023).

## The use of stablecoins for payments outside the crypto market is still negligible

More than half of responding central banks (63%) said that they have accelerated their work on CBDCs in reaction to developments in stablecoins and other cryptoassets. If not properly designed and regulated, the large-scale use of stablecoins for payments could have serious implications for the safety and efficiency of payment ecosystems. Moreover, a widespread use of stablecoins and other cryptoassets more generally could impact financial stability (G7 (2019), FSB (2022)).

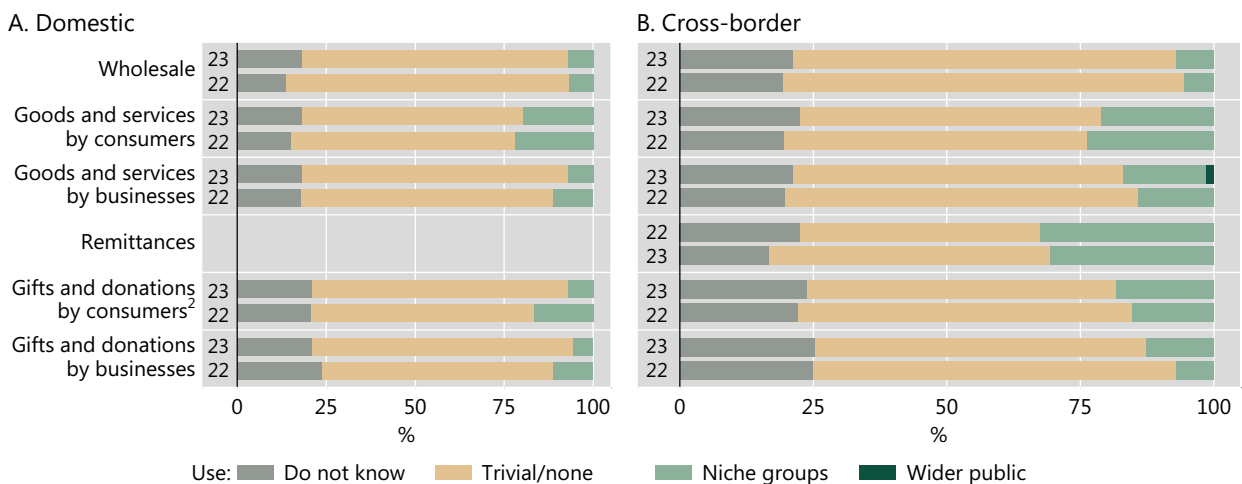
To date, the use of stablecoins for payments outside the crypto ecosystem is still extremely limited (Graph 12). Regardless of the payment purpose, more than half of central banks indicated that the use of stablecoins within their jurisdictions is still trivial or negligible. Where they are used other than for crypto trading or in decentralised finance, this is mainly by niche groups for remittances and retail payments, according to the respondents. The relevance of remittances as a use case for stablecoins and other cryptoassets has also been highlighted by other reports. For example, according to Chainalysis (2023), around 5% of remittances flowing into Mexico in 2022 were made using stablecoins or other cryptoassets.

Yet, many central banks are unsure about the current use of stablecoins: depending on the payment purpose, around 18–25% of central banks said they do not know to what extent stablecoins are used as a payment method. Indeed, various papers and reports have flagged the lack of appropriate data and understanding of

### Current use of stablecoins for payment purposes<sup>1</sup>

As a percentage of respondents

Graph 12



Wider public = used by different groups of consumers/businesses but still for a small share of their total payments made for a particular payment purpose; niche groups = used mainly by a particular group of consumers/businesses and for a small share of their total payments made for a particular payment purpose; trivial/none = hardly used by anyone, and those who do, use it only for a tiny fraction of their total payments made for a particular payment purpose.

<sup>1</sup> Apart from potentially being used in decentralised finance. The sample includes only central banks that have replied to the survey since 2022. <sup>2</sup> Cross-border gifts and donations by consumers in panel B does not include remittances.

Sources: BIS central bank surveys on CBDCs and crypto, 2022–23; authors' calculations.

the use of stablecoins (and other cryptoassets) as an important challenge (FSB (2022), Hacıbedel and Perez-Saiz (2023), Kosse et al (2023)).

## From macro to micro: a growing number of jurisdictions study the use of cryptoassets

The share of jurisdictions collecting data and/or studying the use of stablecoins and other cryptoassets is steadily increasing (Graph 13.A). Although cryptoassets are different from CBDCs in that they do not represent a claim on a central bank, information on the uses and users of cryptoassets might inform CBDC design choices. For example, the use of cryptoassets might shed some light on potential use cases, critical factors influencing adoption and the technologies employed. Increased efforts to better understand the use of stablecoins and other cryptoassets may also help in identifying implications for financial and monetary stability, in addition to the more macro studies done in the past few years (Graph 13.B). The growing body of macro studies, including from international bodies such as the Bank for International Settlements (BIS), ECB, International Monetary Fund (IMF) and Financial Stability Board (FSB), might explain the slow decline in the share of jurisdictions recently looking into this (68% in 2023, down from 73% in 2022).<sup>32</sup>

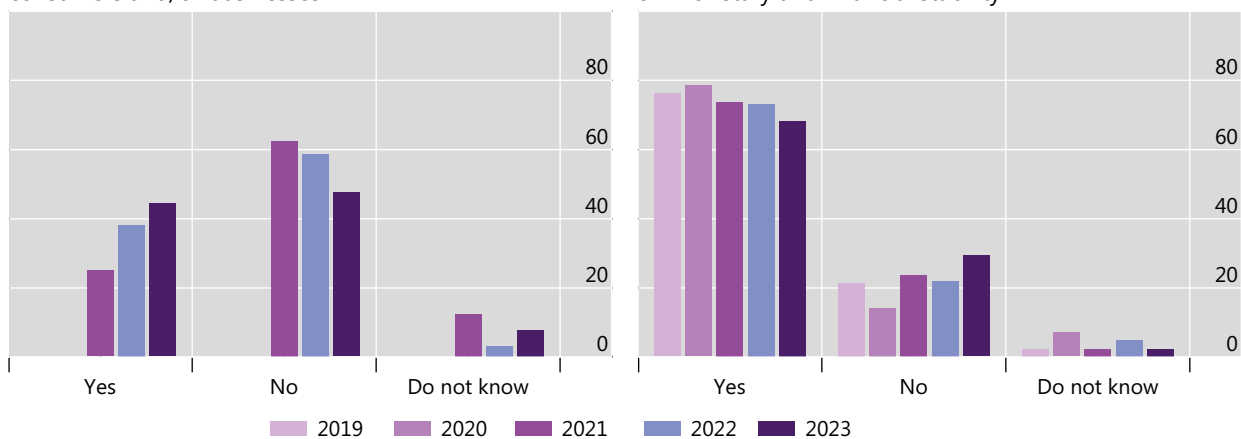
### A rising number of jurisdictions monitor the public use of cryptoassets<sup>1</sup>

As a percentage of respondents

Graph 13

A. Recently studied the use of cryptoassets among consumers and/or businesses<sup>2</sup>

B. Recently studied the potential impact of stablecoins on monetary and financial stability



<sup>1</sup> The sample includes only central banks that have replied to the survey since 2019. <sup>2</sup> This question was introduced in 2021.

Sources: BIS central bank surveys on CBDCs and crypto, 2019–23; authors' calculations.

<sup>32</sup> Examples of macroeconomic research on cryptoassets include IMF (2021), ECB (2022), FSB (2022), BIS (2023b) and CGDFS (2023).

## Two out of three jurisdictions (will soon) regulate cryptoassets

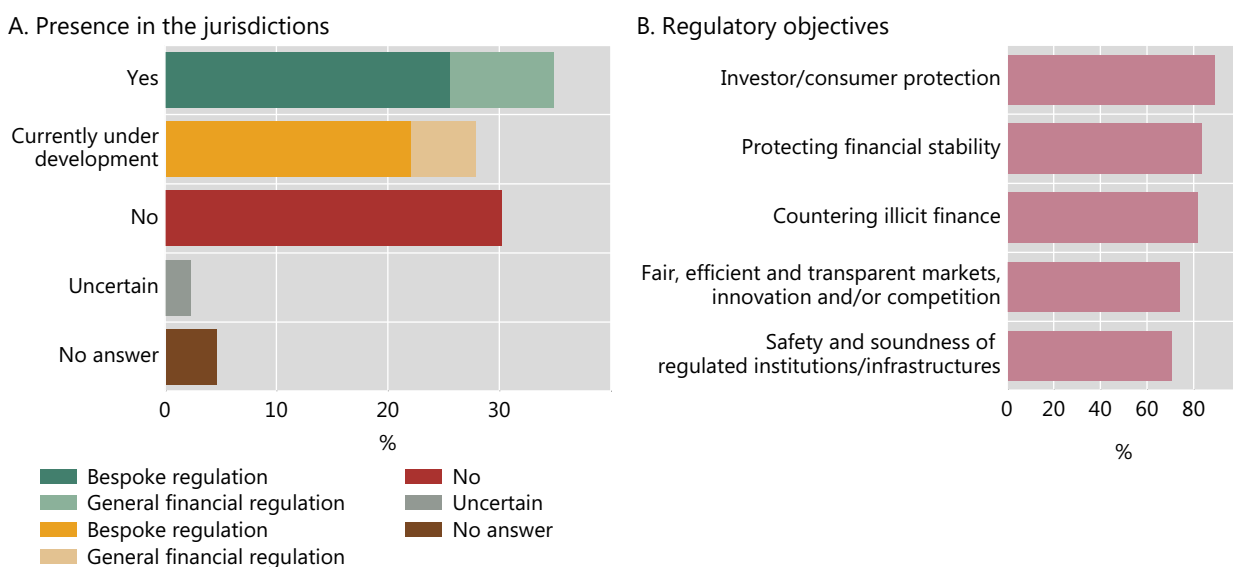
More than 60% of responding jurisdictions currently have or are developing a regulatory framework for stablecoins and other cryptoassets (Graph 14.A). Most of these jurisdictions opted for or are developing bespoke regulation (48%), as the opportunities, risks and/or features of cryptoassets would not neatly fit within their existing regulatory frameworks. Examples of jurisdictions that launched or are working on a tailored regulatory framework include the United Kingdom, Hong Kong SAR and Singapore for stablecoins and the European Union for cryptoassets more generally.<sup>33</sup> A much lower share of jurisdictions regulate cryptoassets based on existing financial regulation (9%) or plan to do so (6%). To date, one out of three jurisdictions does not have a regulatory framework and is not currently developing one.

Existing (and upcoming) regulatory frameworks mainly aim to protect investors and consumers (89%), to safeguard financial stability (83%) and to counter illicit finance (82%) (Graph 14.B). Also, many jurisdictions decided to regulate cryptoassets

### Regulatory framework for stablecoins and other cryptoassets

As a percentage of respondents, 2023

Graph 14



Sources: 2023 BIS central bank survey on CBDCs and crypto; authors' calculations.

<sup>33</sup> More information on the United Kingdom's proposed regulatory regime for stablecoins can be found here: [www.bankofengland.co.uk/paper/2023/dp/regulatory-regime-for-systemic-payment-systems-using-stablecoins-and-related-service-providers](http://www.bankofengland.co.uk/paper/2023/dp/regulatory-regime-for-systemic-payment-systems-using-stablecoins-and-related-service-providers). The HKMA consultation paper on the legislative proposal to implement a regulatory regime for stablecoin issuers can be found here: <https://www.hkma.gov.hk/media/eng/doc/key-information/press-release/2023/20231227e4a1.pdf>. The main elements of Singapore's stablecoin regulatory framework can be found here: [www.mas.gov.sg/news/media-releases/2023/mas-finalises-stablecoin-regulatory-framework](http://www.mas.gov.sg/news/media-releases/2023/mas-finalises-stablecoin-regulatory-framework). For more about the Markets in Crypto-Assets Regulation (MiCA) in the European Union, see [www.esma.europa.eu/esmas-activities/digital-finance-and-innovation/markets-crypto-assets-regulation-mica](http://www.esma.europa.eu/esmas-activities/digital-finance-and-innovation/markets-crypto-assets-regulation-mica).

with the aim of promoting market efficiency, innovation and competition (74%) and ensuring the safety and soundness of regulated institutions (70%).

Given the borderless nature of stablecoins and other cryptoassets, it is paramount that jurisdictions uphold the timely and consistent implementation of international standards and recommendations to prevent regulatory arbitrage, ensure responsible innovation and protect consumers and investors. Examples of relevant standards include the guidance from the BIS Committee on Payments and Market Infrastructures (CPMI) and the International Organization of Securities Commissions (IOSCO) on how to apply the CPMI-IOSCO Principles for financial market infrastructures (PFMI) to systemically important stablecoin arrangements (CPMI-IOSCO (2022)) and the FSB's high-level recommendations on the regulation, supervision and oversight of "global stablecoin" arrangements (FSB (2023)).

## Conclusion

CBDCs have become a topic of global interest. As of late 2023, 94% of 86 surveyed central banks were exploring a CBDC. Over time, CBDC work has evolved from theoretical research on potential implications for payments, monetary policy implementation and financial stability into real-life experiments to test the feasibility and desirability of specific design features. To date, more than half of the central banks are working on proofs of concept, and one out of three is running a pilot.

Many CBDC debates and reports over the past years have centred around retail CBDCs. Are central banks now shifting their attention to wholesale CBDCs? The survey showed a sharp increase in the number of wholesale experiments – mainly in AEs, but various EMDE central banks also stepped up their wholesale CBDC work. In addition, the likelihood that central banks will issue a CBDC within the next six years is now generally greater for wholesale than for retail CBDC.

Central banks further enhanced their engagement with a wide range of stakeholders to inform the design of their potential CBDCs. Many features are still undecided, and there are differences between AEs and EMDEs. Yet, more than half of central banks are considering a retail CBDC that is subject to holding limits, is interoperable with existing domestic payment systems, enables offline payments and is non-interest-bearing. When it comes to wholesale CBDCs, many central banks already consider themselves likely to embed interoperability and programmability.

Preserving the role of central bank money amidst the rapid digitalisation and emergence of privately issued monies is an important driver of the CBDC work of many central banks. The survey showed that, to date, stablecoins are hardly used for payments outside the crypto ecosystem, apart from some use by niche groups for remittances and retail payments. When used at a larger scale and not properly regulated and supervised, stablecoins may compromise the safety and efficiency of payments and the financial system more broadly. The survey demonstrated that two thirds of respondent jurisdictions have or are working on a framework to regulate stablecoins and other cryptoassets.<sup>34</sup>

Clearly, each jurisdiction is unique in terms of economic and social conditions, payment markets and policy objectives. This influences decisions on whether and when to issue a CBDC and on whether and how to regulate stablecoins. As

<sup>34</sup> For a more detailed overview of regulatory responses to stablecoins, see Crisanto et al (2024).

jurisdictions may move in different directions or faster than others, global cooperation is key. Although decisions on CBDC and payments regulation are sovereign ones, jurisdictions must collaborate and coordinate in order to offer users a safe and efficient payment experience, both domestically and internationally.<sup>35</sup> In the end, payment innovations offer opportunities and risks for all. The best way to navigate through these is to embrace the diversity and advance together.

<sup>35</sup> See CPMI et al (2022) for a discussion on and implications of the options for access to and interoperability of CBDCs for cross-border payments.

## References

- Abad, J, G Nuño Barrau and C Thomas (2023): "CBDC and the operational framework of monetary policy", *BIS Working Papers*, no 1126, September.
- Auer, R, G Cornelli and J Frost (2023): "Rise of the central bank digital currencies", *International Journal of Central Banking*, vol 19, no 4, pp 185-214.
- Auer, R, H Banka, N Boakye-Adjei, A Faragallah, J Frost, H Natarajan and J Prenio (2022): "Central bank digital currencies: a new tool in the financial inclusion toolkit?", *FSI Insights on policy implementation*, no 41, April.
- Basel Committee on Banking Supervision (2022): *Prudential treatment of cryptoasset exposures*, December.
- Bank for International Settlements (BIS) (2021): "CBDCs: an opportunity for the monetary system", *Annual Economic Report*, June, Chapter III.
- (2023a): "Blueprint for the future monetary system: improving the old, enabling the new", *Annual Economic Report*, June, Chapter III.
- (2023b): "The crypto ecosystem: key elements and risks", *Report to the G20 Finance Ministers and Central Bank Governors*, July.
- Bank of Canada (2023): *Digital Canadian dollar public consultation report*, November.
- 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 and Bank for International Settlements (2021): *Central bank digital currencies: user needs and adoption*, September.
- Bank of England and HM Treasury (2024): *Response to the Bank of England and HM Treasury consultation paper – The digital pound: a new form of money for households and businesses?*, January.
- Bank of Israel (2024): *Logical architecture for the digital shekel system*, March.
- Barontini, C and H Holden (2019): "Proceeding with caution – a survey on central bank digital currency", *BIS Papers*, no 101, January.
- Bindseil, U (2020): "Tiered CBDC and the financial system", *ECB Working Paper Series*, no 2351, January.
- Bindseil, U and F Panetta (2020): "Central bank digital currency remuneration in a world with low or negative nominal interest rates", *VoxEU*, Centre for Economic Policy Research, October.
- Boar, C and A Wehrli (2021): "Ready, steady, go? – Results of the third BIS survey on central bank digital currency", *BIS Papers*, no 114, January.
- Boar, C, H Holden and A Wadsworth (2020): "Impending arrival – a sequel to the survey on central bank digital currency", *BIS Papers*, no 107, January.
- Brunnermeier, M and J-P Landau (2022): "The digital euro: policy implications and perspectives", European Parliament, January.
- Cantú, C, J Frost, T Goel and J Prenio (2024): "From financial inclusion to financial health", *BIS Bulletin*, no 85, March.
- Central Bank of Nigeria (2023): *Economics of digital currencies: a book of readings*.
- Chainalysis (2023): *The 2023 geography of cryptocurrency report*, October.

Choi, S, B Kim, Y-S Kim and O Kwon (2023): "Central bank digital currency and privacy: a randomized survey experiment", *BIS Working Papers*, no 1147, November.

Cipollone, P (2024): "Digital euro: current state of play", Eurogroup meeting presentation, April.

Committee on Payments and Market Infrastructures (CPMI), BIS Innovation Hub, International Monetary Fund and World Bank (2022): *Options for access to and interoperability of CBDCs for cross-border payments*, July.

Committee on Payments and Market Infrastructures and Markets Committee (CPMI-MC) (2018): *Central bank digital currencies*, March.

Committee on Payments and Market Infrastructures and the Board of the International Organization of Securities Commissions (CPMI-IOSCO) (2022): *Application of the Principles for Financial Market Infrastructures to stablecoin arrangements*, July.

Committee on Payments and Market Infrastructures (CPMI) and World Bank (2016): *Payment aspects of financial inclusion*, April.

Consultative Group of Directors of Financial Stability (CGDFS) (2023): "Financial stability risks from cryptoassets in emerging market economies", *BIS Paper*, no 138, August.

Crisanto, J, J Ehrentraud and D Garcia Ocampo (2024): "Stablecoins: regulatory responses to their promise of stability", *FSI Insights on policy implementation*, no 57, April.

Cunliffe J (2023): "The digital pound", speech given at UK Finance, February.

Demirgüç-Kunt, A, L Klapper, D Singer and S Ansar (2022): *The Global Findex Database 2021: financial inclusion, digital payments, and resilience in the age of COVID-19*.

Durfee, J, J Maniff and P Slattery (2023): "Examining CBDC and wholesale payments", *FEDS Notes*, September.

European Central Bank (ECB) (2022): "Decrypting financial stability risks in cryptoasset markets", *Financial Stability Review*, May.

——— (2023): *Digital euro – Prototype summary and lessons learned*, May.

Financial Stability Board (FSB) (2018): *Crypto-asset markets: Potential channels for future financial stability implications*, October.

——— (2020): *Regulation, supervision and oversight of "global stablecoin" arrangements – final report and high-level recommendations*, October.

——— (2022): *Assessment of risks to financial stability from crypto-assets*, February.

——— (2023): *High-level recommendations for the regulation, supervision and oversight of global stablecoin arrangements: Final report*, July.

Frost, J, P Koo Wilkens, A Kosse, V Shreeti and C Velásquez (2024): "Fast payments: design and adoption", *BIS Quarterly Review*, March.

Global Partnership for Financial Inclusion (GPFI) (2016): *G20 High-Level Principles for Digital Financial Inclusion*, September.

G7 Working Group on Stablecoins (G7) (2019): *Investigating the impact of global stablecoins*, October.



Hacibedel, B and H Perez-Saiz (2023): "Assessing macrofinancial risks from crypto assets", *IMF Working Papers*, no 214, September.

Hong Kong Monetary Authority (2023): *e-HKD Pilot Programme - Phase 1 report*, October.

Huynh, K, J Molnar, O Shcherbakov and Q Yu (2020): "Demand for payment services and consumer welfare: the introduction of a central bank digital currency", *Bank of Canada Staff Working Paper*, no 2020-7, March.

International Monetary Fund (IMF) (2021): "Chapter 2 The crypto ecosystem and financial stability challenges", *Global Financial Stability Report*, October.

Khera P, S Ng, S Ogawa and R Sahay (2021): "Digital financial inclusion in emerging and developing economies: a new index", *IMF Working Papers*, no 90, March.

Kosse, A and I Mattei (2022): "Gaining momentum – Results of the 2021 BIS survey on central bank digital currencies", *BIS Papers*, no 125, May.

——— (2023): "Making headway – Results of the 2022 BIS survey on central bank digital currencies and crypto", *BIS Papers*, no 136, July.

Kosse, A, M Glowka, I Mattei and T Rice (2023): "Will the real stablecoin please stand up?", *BIS Papers*, no 141, November.

Lannquist, A and B Tan (2023): "Central bank digital currency's role in promoting financial inclusion", *IMF Fintech Notes*, no 11, September.

Li, J (2023): "Predicting the demand for central bank digital currency: A structural analysis with survey data", *Journal of Monetary Economics*, vol 134, March, pp 73–85.

Meller, B and O Soons (2023): "Know your (holding) limits: CBDC, financial stability and central bank reliance", *ECB Occasional Paper Series*, no 326, August.

Mikhalev, I, K Burchardi, I Struchkov, B Song and J Gross (2021): *CBDC Tracker*, January.

Monetary Authority of Singapore (MAS) (2023a): *Purpose bound money (PBM) technical whitepaper*, June.

——— (2023b): *Orchid Blueprint – Infrastructure for safe and innovative use of digital money in Singapore*, November.

Neuhaus, H and M Plooj (2023): "Central bank money settlement of wholesale transactions in the face of technology innovation", *ECB Economic Bulletin*, no 8/2023.

Reserve Bank of India (2024): *Statement on developmental and regulatory policies*, February.

Reserve Bank of New Zealand (2024): *Digital cash in New Zealand – Consultation paper*, April.

South African Reserve Bank (2024): *Digital Payments Roadmap: Towards inclusive, accessible, effective and sustainable digital payments in South Africa*, April.

Sveriges Riksbank (2024): *E-krona pilot Phase 4*, March.

## Annex A: Survey questions

### Questions on central bank digital currencies

**1.** Has your central bank engaged, or will it engage, in any kind of research, experiments or development work related to the development and use of CBDC?

- Yes
- No

**2.** Is your work related to:

*[Only for those who clicked "yes" under Q1]*

- Retail CBDC
- Wholesale CBDC
- Both

**2a.** Your CBDC is related to **both**. Please specify:

*[Only for those who clicked "both" under Q2]*

- Your retail CBDC and wholesale CBDC work are separate projects
- Your retail and wholesale CBDC work are part of the same project
- Both

**3.** What type of work is being, or will be, conducted? Please check all that apply.

**Research/study:** *exploratory work, eg to explore use cases, impact and feasibility, without any technical development.*

**Experiments/proof of concept:** *early testing of one or a small number of selected aspects of the CBDC in a controlled and internal environment.*

**Developing or running a pilot:** *developing or testing a prototype in the real world among a restricted number of external participants.*

**Live:** *CBDC issued for widespread use.*

#### **Retail CBDC**

*[Only for those who clicked Retail CBDC or Both under Q2]*

- Research/study
- Experiments/Proof of concept
- Developing or running a pilot
- Working on a live CBDC
- Live CBDC has been issued

Please provide links (eg to websites, publications, official communications) about your project(s):

### **Wholesale CBDC**

*[Only for those who clicked Wholesale CBDC or Both under Q2]*

- Research/study
- Experiments/Proof of concept
- Developing or running a pilot
- Working on a live CBDC
- Live CBDC has been issued

Please provide links (eg to websites, publications, official communications) about your project(s):

**4.** How important are the following aspects to your motivations in (potentially) issuing a:

### **Retail CBDC**

*[Only for those who clicked Retail CBDC or Both under Q2]*

	Very important	Important	Somewhat important	Not so important
Financial stability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Monetary policy implementation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Financial inclusion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Payments efficiency (domestic)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Payments efficiency (cross-border)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Payments safety/robustness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Others: <input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please provide any comments on your motivations for any aspects you considered as very important or important (eg if you chose "financial stability" as an important motivation, how do you see CBDC aiding this?).

### **Wholesale CBDC**

*[Only for those who clicked Wholesale CBDC or Both under Q2]*

	Very important	Important	Somewhat important	Not so important
Financial stability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Monetary policy implementation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Financial inclusion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Payments efficiency (domestic)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Payments efficiency (cross-border)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Payments safety/robustness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Others: <input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please provide any comments on your motivations for any aspects you considered as very important or important (eg if you chose “financial stability” as an important motivation, how do you see CBDC aiding this?). [Enter text here]

5. How important is “preserving the role of central bank money” to your motivations in (potentially) issuing a:

	Very important	Important	Somewhat important	Not so important
Retail CBDC <i>[Only for those who clicked Retail CBDC or Both under Q2]</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wholesale CBDC <i>[Only for those who clicked Wholesale CBDC or Both under Q2]</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. Is this aspect of “preserving the role of central bank money” related to your answers to the previous question (Q4) on motivations?

**Retail CBDC**

*[Only for those who answered very important, important and somewhat important to Q5]*

	<b>Yes:</b> preserving the role of central bank money is <b>key</b> to this aspect	<b>Partly:</b> preserving the role of central bank money is <b>only one part of</b> this aspect	<b>No:</b> this is a separate aspect	Please explain:
Financial stability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[Enter text here]
Monetary policy implementation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[Enter text here]
Financial inclusion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[Enter text here]
Payments efficiency (domestic)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[Enter text here]
Payments efficiency (cross-border)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[Enter text here]
Payments safety/robustness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[Enter text here]

7. Is this aspect of “preserving the role of central bank money” related to your answers to the previous question (Q4) on motivations?

**Wholesale CBDC**

*[Only for those who answered very important, important and somewhat important to Q5]*

	<b>Yes:</b> preserving the role of central bank money is <b>key</b> to this aspect	<b>Partly:</b> preserving the role of central bank money is <b>only one part of</b> this aspect	<b>No:</b> this is a separate aspect	Please explain:
Financial stability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[Enter text here]
Monetary policy implementation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[Enter text here]
Financial inclusion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[Enter text here]
Payments efficiency (domestic)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[Enter text here]
Payments efficiency (cross-border)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[Enter text here]
Payments safety/robustness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[Enter text here]

8. If you are developing (or have developed) a proof of concept, pilot or a live CBDC, are (were) you collaborating or having a dialogue with other entities to inform your design choices? Please select all that apply.

**Retail CBDC**

*[Only for those who clicked Retail CBDC or Both under Q2]*

- No
- Yes, with other central banks, to inform **domestic** design choices
- Yes, with other central banks, to inform **cross-border** design choices
- Yes, with the government and/or other relevant public authorities, namely: [Enter text here]
- Yes, with academics
- Yes, with non-profit and/or international organisations, namely: [Enter text here]
- Yes, with third-party developers/technology providers
- Yes, with other private sector entities, namely: [Enter text here]
- Yes, with end users/end user groups
- Yes, with others, namely: [Enter text here]

For each of the “Yes” boxes that you selected above (for Retail CBDC), please provide more details on the **form** and **frequency** of this collaboration and/or dialogue.

*[Only appears if “Yes” clicked above/conditional question]*

<b>Collaboration with:</b>	<b>Form</b> Please check all that apply:	<b>Frequency</b> Please check all that apply:
Other central banks, to inform <b>domestic</b> design choices	<input type="checkbox"/> Bilateral <input type="checkbox"/> Multilateral <input type="checkbox"/> Public consultations <input type="checkbox"/> Other: [Enter text here]	<input type="checkbox"/> Ad hoc <input type="checkbox"/> One-off <input type="checkbox"/> Continuous/ongoing <input type="checkbox"/> Periodically/regular <input type="checkbox"/> Other: [Enter text here]
Other central banks, to inform <b>cross-border</b> design choices	<input type="checkbox"/> Bilateral <input type="checkbox"/> Multilateral <input type="checkbox"/> Public consultations <input type="checkbox"/> Other: [Enter text here]	<input type="checkbox"/> Ad hoc <input type="checkbox"/> One-off <input type="checkbox"/> Continuous/ongoing <input type="checkbox"/> Periodically/regular <input type="checkbox"/> Other: [Enter text here]
Government and/or other relevant public authorities	<input type="checkbox"/> Bilateral <input type="checkbox"/> Multilateral <input type="checkbox"/> Public consultations <input type="checkbox"/> Other: [Enter text here]	<input type="checkbox"/> Ad hoc <input type="checkbox"/> One-off <input type="checkbox"/> Continuous/ongoing <input type="checkbox"/> Periodically/regular <input type="checkbox"/> Other: [Enter text here]
Academics	<input type="checkbox"/> Bilateral <input type="checkbox"/> Multilateral <input type="checkbox"/> Public consultations <input type="checkbox"/> Other: [Enter text here]	<input type="checkbox"/> Ad hoc <input type="checkbox"/> One-off <input type="checkbox"/> Continuous/ongoing <input type="checkbox"/> Periodically/regular <input type="checkbox"/> Other: [Enter text here]
Non-profit and/or international organisations	<input type="checkbox"/> Bilateral <input type="checkbox"/> Multilateral <input type="checkbox"/> Public consultations <input type="checkbox"/> Other: [Enter text here]	<input type="checkbox"/> Ad hoc <input type="checkbox"/> One-off <input type="checkbox"/> Continuous/ongoing <input type="checkbox"/> Periodically/regular <input type="checkbox"/> Other: [Enter text here]
Third-party developers/technology providers	<input type="checkbox"/> Bilateral <input type="checkbox"/> Multilateral <input type="checkbox"/> Public consultations <input type="checkbox"/> Other: [Enter text here]	<input type="checkbox"/> Ad hoc <input type="checkbox"/> One-off <input type="checkbox"/> Continuous/ongoing <input type="checkbox"/> Periodically/regular <input type="checkbox"/> Other: [Enter text here]
Other private sector entities	<input type="checkbox"/> Bilateral <input type="checkbox"/> Multilateral <input type="checkbox"/> Public consultations <input type="checkbox"/> Other: [Enter text here]	<input type="checkbox"/> Ad hoc <input type="checkbox"/> One-off <input type="checkbox"/> Continuous/ongoing <input type="checkbox"/> Periodically/regular <input type="checkbox"/> Other: [Enter text here]
End users/end user groups	<input type="checkbox"/> Bilateral <input type="checkbox"/> Multilateral <input type="checkbox"/> Public consultations <input type="checkbox"/> Other: [Enter text here]	<input type="checkbox"/> Ad hoc <input type="checkbox"/> One-off <input type="checkbox"/> Continuous/ongoing <input type="checkbox"/> Periodically/regular <input type="checkbox"/> Other: [Enter text here]
Others: [Enter text here]:	<input type="checkbox"/> Bilateral <input type="checkbox"/> Multilateral <input type="checkbox"/> Public consultations <input type="checkbox"/> Other: [Enter text here]	<input type="checkbox"/> Ad hoc <input type="checkbox"/> One-off <input type="checkbox"/> Continuous/ongoing <input type="checkbox"/> Periodically/regular <input type="checkbox"/> Other: [Enter text here]

Please provide the link to public engagement/consultation document(s), if available:  
 [Enter text here]

**Wholesale CBDC**

*[Only for those who clicked Wholesale CBDC or Both under Q2]*

- No
- Yes, with other central banks, to inform **domestic** design choices
- Yes, with other central banks, to inform **cross-border** design choices
- Yes, with the government and/or other relevant public authorities, namely: [Enter text here]
- Yes, with academics
- Yes, with non-profit and/or international organisations, namely: [Enter text here]
- Yes, with third-party developers/technology providers
- Yes, with other private sector entities, namely: [Enter text here]
- Yes, with end users/end user groups
- Yes, with others, namely: [Enter text here]

For each of the “Yes” boxes that you selected above (for Wholesale CBDC), please provide more details on the **form** and **frequency** of this collaboration and/or dialogue.

*[Only appears if “Yes” clicked above/conditional question]*

<b>Collaboration with:</b>	<b>Form</b> Please check all that apply:	<b>Frequency</b> Please check all that apply:
Other central banks, to inform <b>domestic</b> design choices	<input type="checkbox"/> Bilateral <input type="checkbox"/> Multilateral <input type="checkbox"/> Public consultations <input type="checkbox"/> Other: [Enter text here]	<input type="checkbox"/> Ad hoc <input type="checkbox"/> One-off <input type="checkbox"/> Continuous/ongoing <input type="checkbox"/> Periodically/regular <input type="checkbox"/> Other: [Enter text here]
Other central banks, to inform <b>cross-border</b> design choices	<input type="checkbox"/> Bilateral <input type="checkbox"/> Multilateral <input type="checkbox"/> Public consultations <input type="checkbox"/> Other: [Enter text here]	<input type="checkbox"/> Ad hoc <input type="checkbox"/> One-off <input type="checkbox"/> Continuous/ongoing <input type="checkbox"/> Periodically/regular <input type="checkbox"/> Other: [Enter text here]
Government and/or other relevant public authorities	<input type="checkbox"/> Bilateral <input type="checkbox"/> Multilateral <input type="checkbox"/> Public consultations <input type="checkbox"/> Other: [Enter text here]	<input type="checkbox"/> Ad hoc <input type="checkbox"/> One-off <input type="checkbox"/> Continuous/ongoing <input type="checkbox"/> Periodically/regular <input type="checkbox"/> Other: [Enter text here]
Academics	<input type="checkbox"/> Bilateral <input type="checkbox"/> Multilateral <input type="checkbox"/> Public consultations <input type="checkbox"/> Other: [Enter text here]	<input type="checkbox"/> Ad hoc <input type="checkbox"/> One-off <input type="checkbox"/> Continuous/ongoing <input type="checkbox"/> Periodically/regular <input type="checkbox"/> Other: [Enter text here]
Non-profit and/or international organisations	<input type="checkbox"/> Bilateral <input type="checkbox"/> Multilateral <input type="checkbox"/> Public consultations <input type="checkbox"/> Other: [Enter text here]	<input type="checkbox"/> Ad hoc <input type="checkbox"/> One-off <input type="checkbox"/> Continuous/ongoing <input type="checkbox"/> Periodically/regular <input type="checkbox"/> Other: [Enter text here]

(continued)

<b>Collaboration with:</b>	<b>Form</b> Please check all that apply:	<b>Frequency</b> Please check all that apply:
Third-party developers/technology providers	<input type="checkbox"/> Bilateral <input type="checkbox"/> Multilateral <input type="checkbox"/> Public consultations <input type="checkbox"/> Other: [Enter text here]	<input type="checkbox"/> Ad hoc <input type="checkbox"/> One-off <input type="checkbox"/> Continuous/ongoing <input type="checkbox"/> Periodically/regular <input type="checkbox"/> Other: [Enter text here]
Other private sector entities	<input type="checkbox"/> Bilateral <input type="checkbox"/> Multilateral <input type="checkbox"/> Public consultations <input type="checkbox"/> Other: [Enter text here]	<input type="checkbox"/> Ad hoc <input type="checkbox"/> One-off <input type="checkbox"/> Continuous/ongoing <input type="checkbox"/> Periodically/regular <input type="checkbox"/> Other: [Enter text here]
End users/end user groups	<input type="checkbox"/> Bilateral <input type="checkbox"/> Multilateral <input type="checkbox"/> Public consultations <input type="checkbox"/> Other: [Enter text here]	<input type="checkbox"/> Ad hoc <input type="checkbox"/> One-off <input type="checkbox"/> Continuous/ongoing <input type="checkbox"/> Periodically/regular <input type="checkbox"/> Other: [Enter text here]
Others: [Enter text here]:	<input type="checkbox"/> Bilateral <input type="checkbox"/> Multilateral <input type="checkbox"/> Public consultations <input type="checkbox"/> Other: [Enter text here]	<input type="checkbox"/> Ad hoc <input type="checkbox"/> One-off <input type="checkbox"/> Continuous/ongoing <input type="checkbox"/> Periodically/regular <input type="checkbox"/> Other: [Enter text here]

Please provide the link to public engagement/consultation document(s), if available:

[Enter text here]

**9.** How likely is it that your central bank will issue a live CBDC in the:

**Retail CBDC**

*[To all]*

	Very likely	Somewhat likely	Possible	Somewhat unlikely	Very unlikely	Not applicable, already issued
<b>Short term</b> (within the next 3 years)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Medium term</b> (within the next 4 to 6 years)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



**Wholesale CBDC**

*[To all]*

	Very likely	Somewhat likely	Possible	Somewhat unlikely	Very unlikely	Not applicable, already issued
<b>Short term</b> (within the next 3 years)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Medium term</b> (within the next 4 to 6 years)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**10.** Will your potential future CBDC have the following design features, or, if you have already issued a CBDC, does your CBDC have the following design features:

**Retail CBDC**

*[Only for those who clicked Retail CBDC or Both under Q2]*

	Yes	Likely	Unsure	Unlikely	No	Please provide details
Obligation for merchants to accept it	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[Enter text here]
Interest-bearing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[Enter text here]
Limits on balances	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[Enter text here]
Limits on transactions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[Enter text here]
Accessible to non-residents	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[Enter text here]
Restrictions on usage by non-residents	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[Enter text here]
On a distributed ledger technology (DLT)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[Enter text here]
Interoperable with CBDCs of other jurisdictions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[Enter text here]
Interoperable with other cross-border payment systems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[Enter text here]
Interoperable with domestic payment systems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[Enter text here]
Allow for offline payments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[Enter text here]
Users need to have a commercial bank account to open a wallet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[Enter text here]
Embedded capital flow management measures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[Enter text here]
Payments can be automatically executed conditional upon preset criteria (programmable payments)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[Enter text here]
CBDC can be programmed for specific purposes (programmable money)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[Enter text here]

### **Wholesale CBDC**

*[Only for those who clicked Wholesale CBDC or Both under Q2]*

	Yes	Likely	Unsure	Unlikely	No	Please provide details
Obligation for payment service providers to connect	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[Enter text here]
Accessible to foreign payment service providers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[Enter text here]
On a distributed ledger technology (DLT)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[Enter text here]
Interoperable with CBDCs of other jurisdictions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[Enter text here]
Interoperable with other cross-border payment systems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[Enter text here]
Interoperable with domestic payment systems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[Enter text here]
Embedded capital flow management measures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[Enter text here]
Payments can be automatically executed conditional upon preset criteria (programmable payments)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[Enter text here]
CBDC can be programmed for specific purposes (programmable money)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[Enter text here]

**11a.** What use cases do you envision or consider for your (potential) **retail CBDC** (eg point-of-sale transactions, e-commerce, person-to-person, government payments)?

*[Open question - Only for those who clicked Retail CBDC or Both under Q2]*

[Enter text here]

**11b.** What use cases do you envision or consider for your (potential) **wholesale CBDC** (eg settlement of interbank payments, delivery versus payment of tokenised assets, foreign exchange transactions)?

*[Open question - Only for those who clicked Wholesale CBDC or Both under Q2]*

[Enter text here]

**12.** If you are developing (or have developed) a proof of concept, pilot or a live **retail CBDC**, have you considered (decided on) a possible business model (eg regarding merchant fees, fees for opening wallets, remuneration of intermediaries)?

*[Only for those who clicked Retail CBDC or Both under Q2]*

Yes

No

Please provide further details: [Enter text here]

**13.** Does your central bank have the legal authority to issue a CBDC?

*[To all]*

- Yes
- No
- Uncertain
- Laws are currently being changed to allow for it
- Laws are currently being changed to clarify the legal authority

Please provide any comments or clarifications:

**14a.** If your central bank has issued a live **retail CBDC**, how would you assess its current use?

*[Only to be answered by those who have issued a retail CBDC]*

**Trivial/no use:** *hardly used by anyone, and those who do only use it for a tiny fraction of their total payments.*

**Used by niche groups:** *mainly used by a particular group of users and for a small share of their total payments.*

**Wider public use:** *used by different groups of users but still for a small share of their total payments.*

**Significant use:** *used by different types of users and for a significant share of their total payments.*

	Trivial/no use	Used by niche groups	Wider public use	Significant use	Do not know
Current use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**14b.** If your central bank has issued a live **retail CBDC**, please provide the following statistics – if possible for the requested period, or else please indicate the respective month(s).

*[Only to be answered by those who have issued a retail CBDC]*

- **Number of users** at the end of September 2023:
- **Number of transactions** in September 2023:
- **Value of transactions** in September 2023:
- **Value of outstanding balances** at the end of September 2023:
- **Share of CBDC transactions as a percentage of total point-of-sale transactions** at the end of September 2023:
- **Share of CBDC transactions as a percentage of total online transactions** at the end of September 2023:

**15a.** For your jurisdiction, please select:

[To all]

	True	False	Not applicable	Do not know
The amount of physical cash in circulation is declining	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The use of physical cash for payments is declining	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There are measures in place to protect access to physical cash. If "True", please clarify: [Enter text here]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your central bank has carried out a recent study of public cash use (eg a payments diary). If "True", please provide a link to publications if any: [Enter text here]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The emergence of cryptoassets, incl stablecoins, has accelerated your CBDC work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your central bank is considering a potential retail CBDC architecture that involves a role for the private sector (or currently has such a retail CBDC architecture)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please provide any comments or clarifications: [Enter text here]

**15b.** If your central bank is considering a potential **retail CBDC** architecture that involves a role for the private sector (or currently has such a retail CBDC architecture), which tasks do you believe the private sector could potentially take on (or is currently taking on)? Please select all that apply. [To be answered by those who are considering a potential retail CBDC architecture that involves a role for the private sector]

- Onboarding of clients (incl KYC)
- Provision of wallets, user interface and other front-end customer services (eg support)
- Handling/validation of retail payments
- Recording of retail transactions and updating balances
- Provision of value-added services
- Other: [Enter text here]

Please provide any comments or clarifications: [Enter text here]

**16.** Please provide any other details about CBDC and the thoughts and work in your jurisdiction:

[To all]

[Enter text here]

## Questions on cryptoassets

**17. Currently**, in your jurisdiction, apart from (potentially) being used in decentralised finance (DeFi) and crypto trading, how significant do you think the use of **stablecoins** is for the following purposes?

*[To all]*

**Trivial/no use:** hardly used by anyone, and those who do only use it for a tiny fraction of their total payments made for this purpose.

**Used by niche groups:** mainly used by a particular group of consumers/businesses and for a small share of their total payments made for this purpose.

**Wider public use:** used by different groups of consumers/businesses but still for a small share of their total payments made for this purpose.

**Significant use:** used by different groups of consumers/businesses and for a significant share of their total payments made for this purpose.

	Trivial/ no use	Used by niche groups	Wider public use	Significant use	Do not know
Domestic wholesale payments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Domestic payments for goods and services by consumers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Domestic payments for goods and services by businesses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Domestic payments for gifts and donations by consumers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Domestic payments for gifts and donations by businesses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other domestic payments: [Enter text here]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cross-border wholesale payments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cross-border payments for goods and services by consumers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cross-border payments for goods and services by businesses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Remittances	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cross-border payments for gifts and donations by consumers (excl remittances)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cross-border payments for gifts and donations by businesses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other cross-border payments: [Enter text here]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please provide any comments or clarifications: [Enter text here]

**18.** In your jurisdiction, is there a regulatory framework that covers **stablecoins** and **other cryptoassets**?

*[To all]*

- Yes, general financial regulation applies
- Yes, bespoke regulation applies
- General financial regulation is currently being changed to cover cryptoassets
- Bespoke regulation is currently being developed for cryptoassets
- No
- Uncertain

Please provide any details (eg links): [Enter text here]

**19.** In your jurisdiction, what are the regulatory objectives of the current (upcoming) regulatory framework for **stablecoins** and **other cryptoassets**? Please select all that apply.

*[Only to be answered by those who (will) have a regulatory framework (ie who answered 1–4 to the previous question)]*

- Ensuring the safety and soundness of banks and other regulated institutions/market infrastructures
- Promoting fair, efficient and transparent markets, innovation and/or competition
- Protecting financial stability
- Investor/consumer protection
- Countering illicit finance
- Other: [Enter text here]

Please provide any details (eg links): [Enter text here]

**20.** In your jurisdiction, are you analysing the potential impact of **stablecoins** on monetary and financial stability?

*[To all]*

- Yes
- No
- Do not know

If yes, please provide any details (eg links): [Enter text here]

**21.** Has your central bank or (an)other institution(s) in your jurisdiction collected data and/or studied the usage of **stablecoins** (or more broadly **cryptoassets**) among consumers and/or businesses?

*[To all]*

- Yes
- No
- Do not know

If yes, please provide any details (eg links): [Enter text here]

## Annex B: Central banks participating in the survey

Jurisdictions of the 86 central banks that participated in the 2023 survey<sup>1</sup>

Table B1

Jurisdiction	Country group	Jurisdiction	Country group	Jurisdiction	Country group
Angola	EMDE	Haiti	EMDE	Pakistan	EMDE
Argentina	EMDE	Honduras	EMDE	Paraguay	EMDE
Australia	AE	Hong Kong SAR	AE	Peru	EMDE
Bangladesh	EMDE	Hungary	EMDE	Philippines (the)	EMDE
Belgium	AE	Iceland	AE	Poland	EMDE
Bolivia	EMDE	India	EMDE	Myanmar <sup>2</sup>	EMDE
Brazil	EMDE	Indonesia	EMDE	Saudi Arabia	EMDE
Canada	AE	Iraq	EMDE	Serbia	EMDE
Cayman Islands	EMDE	Israel	AE	Seychelles	EMDE
Chile	EMDE	Italy	AE	Singapore	AE
China	EMDE	Jamaica	EMDE	Slovenia	AE
Chinese Taipei	AE	Japan	AE	South Africa	EMDE
Colombia	EMDE	Kosovo	EMDE	South Korea	AE
(Democratic Republic of the) Congo (the)	EMDE	Kuwait	EMDE	Spain	AE
Costa Rica	EMDE	Laos <sup>2</sup>	EMDE	Sri Lanka	EMDE
Czechia	AE	Lesotho	EMDE	Eswatini	EMDE
Denmark	AE	Lithuania	AE	Sweden	AE
Dominican Republic (the)	EMDE	Macao SAR	AE	Switzerland	AE
Ecuador	EMDE	Madagascar	EMDE	Thailand	EMDE
Egypt	EMDE	Malaysia	EMDE	Türkiye	EMDE
El Salvador	EMDE	Mauritius	EMDE	Uganda	EMDE
Euro area	AE	Mexico	EMDE	Ukraine	EMDE
Fiji	EMDE	Mongolia	EMDE	United Arab Emirates (the)	EMDE
Finland	AE	Montenegro	EMDE	United Kingdom (the)	AE
France	AE	Morocco	EMDE	United States (the)	AE
Georgia	EMDE	Mozambique	EMDE	Uruguay	EMDE
Germany	AE	Netherlands (the)	AE	Vietnam	EMDE
Ghana	EMDE	New Zealand	AE	Zimbabwe	EMDE
Guatemala	EMDE	Norway	AE		

<sup>1</sup> The survey was carried out between October 2023 and January 2024. The categorisation of jurisdictions into advanced economies (AEs) and emerging market and developing economies (EMDEs) is based on the World Economic Outlook (WEO) classification of the International Monetary Fund (IMF). <sup>2</sup> First-time participant in the survey.

Source: 2023 BIS central bank survey on CBDCs and crypto.