

# CBDCs Trend Report

## CBDCs

### What is a CBDC

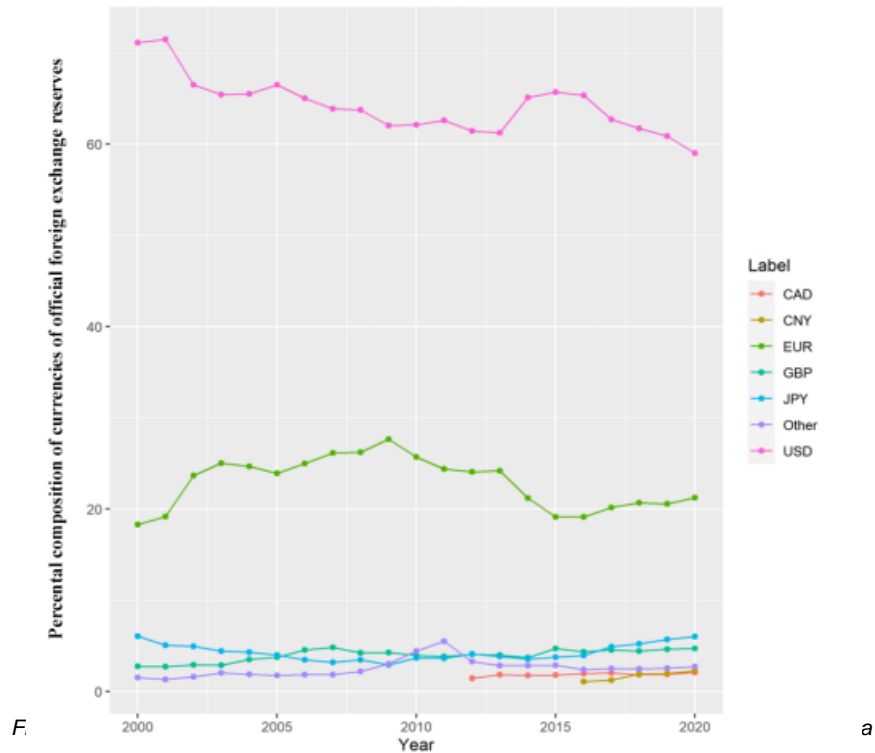
A central bank digital currency (CBDC) is a form of digital money issued by the central bank of a country. It represents a liability of the central bank, and it is denominated in the national unit of account. Although it can be confused with them, it is different from other forms of cashless payment instruments, like credit transfers, card payments, and direct debits. The main difference lies in the fact that a CBDC represents a direct claim on a central bank and not a liability of a private financial institution.

CBDCs can be broadly categorised into two different types: the ‘retail’ CBDC and the ‘wholesale’ CBDC. If the CBDC can be used for a general purpose and be chosen by the public as a new way to store value and make payments, it is considered a ‘retail’ CBDC. On the contrary, a ‘wholesale’ CBDC looks much like today’s central bank reserves and settlement accounts, but addresses a different target group. More specifically, a ‘wholesale’ CBDC could be used to settle large interbank payments or transactions of financial assets, in central bank money.

### The competitive landscape for CBDCs

A year ago, EUBOF released its thematic report on CBDCs, providing a foundation for understanding CBDCs, the basic design architectures for the digital euro, and defining CBDC’s key players across the globe.

Although important updates about CBDCs are given continuously, and the CBDC scene is constantly evolving and changing, there are certainly key players identified for their advanced state of CBDC development. Whether it is issuing a seminal paper, deploying a pilot project, or experimenting in the private sector, Canada, China, Europe, the UK, Japan, and the USA are the most developed contenders. Bearing in mind on of CBDCs function as linear extensions of the underlying fiat currency, the USA and Europe have an advantage due to their currency’s dominant position, yet the digital Yuan, with its advanced stage pilots and limited public release should also be included as a serious contender.



## The Global State of CBDCs - BIS Survey

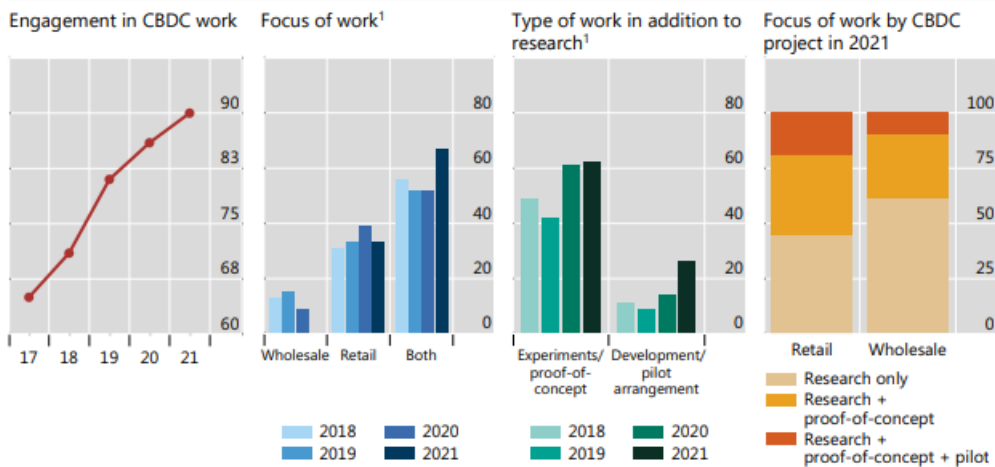
In May 2022, the Bank for International Settlements (BIS) released the results of the ‘2021 BIS Survey on Central Bank Digital Currencies’. A record 81 central banks participated in the survey, whose jurisdictions represent almost 76% of the world’s population and 94% of the global economic output. 56 out of the 81 central banks belong to emerging markets and developing economies (EMDEs), while the remaining 25 belong to advanced economies (AEs).

According to the results of the survey, the last 4 years have seen an exponential growth in central banks working with CBDCs, with 90% of the banks engaging in CBDC work (first panel). The main focus of the central banks has been mostly on the combination of retail and wholesale CBDCs or solely the retail CBDCs (second panel). Over the last two years, most of the central banks have conducted a steady number of experiments and proofs-of-concept (third panel). However, in 2021, the number of pilot programs almost doubled from 14% to 26% (third panel). Generally, central banks overwhelmingly focus on retail CBDCs compared to wholesale (fourth panel).

Central bank involvement in CBDC work rises further

Share of respondents

Graph 1



<sup>1</sup> Share of respondents conducting work on CBDCs.

Source: 2021 BIS central bank survey on CBDCs and digital tokens.

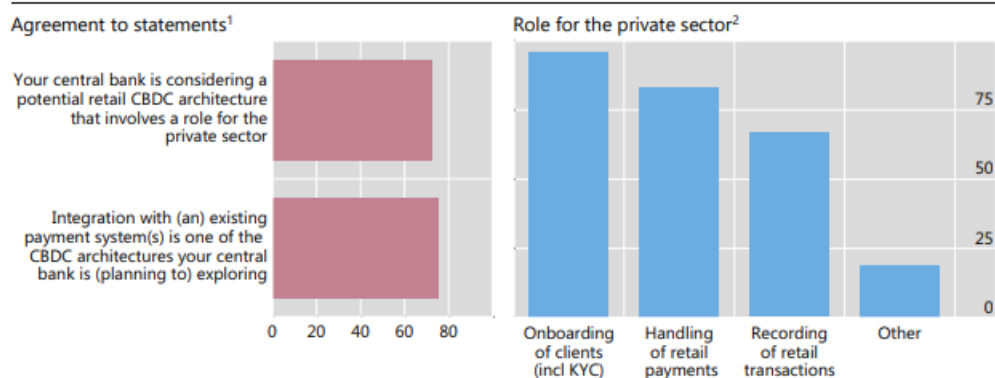
Figure 8, Central bank involvement in CBDC. Source: 2021 BIS survey on CBDCs

Moreover, 76% of the central banks are exploring the integration of CBDC with (an) existing payment system(s), while almost 70% of the central banks are also considering a potential retail CBDC architecture that involves the private sector (left panel). The role of the private sector covers a range of responsibilities including the handling and recording of retail payments, and predominately the know-your-customer (KYC) process (95%) (right panel).

CBDC architecture

Share of respondents

Graph 2



<sup>1</sup> The panel shows the share of respondents who agreed to the two statements after removing those for whom the statements were not applicable. Both statements were added to the survey for the first time. <sup>2</sup> The question could be answered only by central banks that are considering a potential retail CBDC architecture which involves a role for the private sector.

Source: 2021 BIS central bank survey on CBDCs and digital tokens.

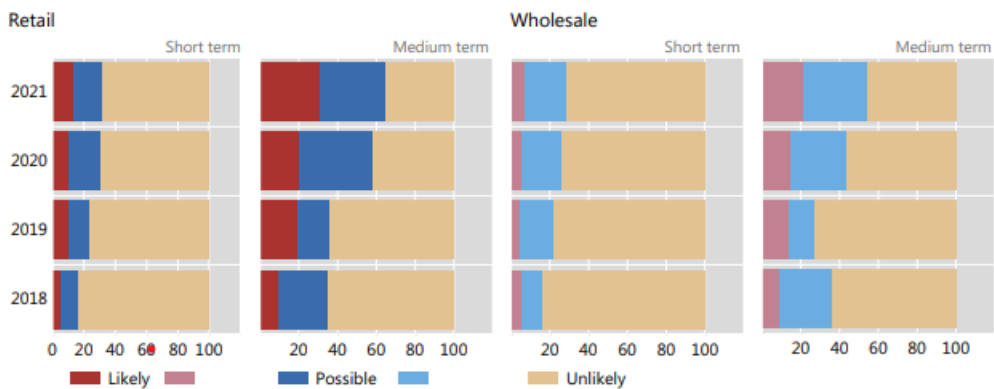
Figure 9, CBDC architecture. Source: 2021 BIS survey on CBDCs

The survey also indicates the possibility that half of the central banks will issue a CBDC in the foreseeable future. More specifically, central banks in the Bahamas, China, the Eastern Caribbean Currency Union, and Nigeria are already issuing or piloting a retail CBDC. Most central banks consider it likely or possible that they will issue a retail CBDC in the medium term, while there is less likelihood of a wholesale CBDC in the short or medium term.

**Likelihood of issuing a CBDC in the foreseeable future**

Share of respondents

Graph 6



Short term: 1–3 years; Medium term: 1–6 years. "Likely" combines "very likely" and "somewhat likely". "Unlikely" combines "very unlikely" and "somewhat unlikely".

Source: 2021 BIS central bank survey on CBDCs and digital tokens.

Figure 10, Likelihood of issuing a CBDC in the foreseeable future. Source: 2021 BIS survey on CBDCs

Finally, more and more central banks are working on adjusting legal frameworks to facilitate the issuance of a CBDC. Compared to 2020, the share of central banks that have the legal authority to issue a CBDC has increased from 18% (2020) to 26% (2021). Moreover, the uncertainty around the legal framework of CBDCs has been mitigated outstandingly with almost 70% uncertainty in 2017 reduced to 40% uncertainty in 2021.

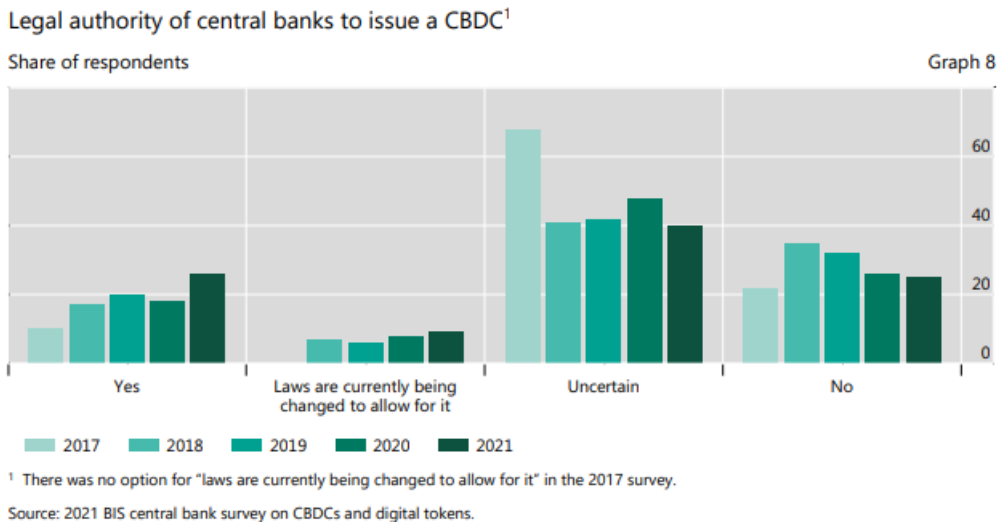


Figure 11, Legal authority of central banks to issue a CBDC. Source: 2021 BIS survey on CBDCs

## [BIS Innovation Hub Singapore Centre](#)

In March 2022, the BIS Innovation Hub published a report about Project Dunbar. This project is a synergy between the Bank for International Settlements (BIS) Innovation Hub Singapore Centre, the Reserve Bank of Australia (RBA), the Bank Negara Malaysia (BNM), the Monetary Authority of Singapore (MAS), and the South African Reserve Bank (SARB) and it aimed to explore ways that a common platform for numerous different CBDCs could enable cheaper, faster, and safer cross-border payments. Cross-border payments are the fund transfers that take place where the sender and the recipient are in different jurisdictions. Project Dunbar, as one of the first technical experiments in the CBDC space, successfully developed design approaches that aim to tackle three critical challenges for multi-CBDC platforms: enabling CBDCs access to non-resident banks, jurisdictional boundaries, and optimisation of universality and autonomy.

## [Bulletin of Monetary Economics and Banking](#)

In June 2022, the Bulletin of Monetary Economics and Banking released a paper called ‘Central Bank Digital Currency: What Factors Determine its Adoption?’. The paper discusses the different kinds of central bank digital currency adoption in emerging and advanced countries. To summarize, on the basis of cross-country datasets, the paper proves that the use of wholesale CBDC is more developed in countries with advanced financial markets and greater cross-border transactions, while retail CBDC is mostly used in countries with lower financial inclusion and a large informal economy.

## [Bank of Canada on the Resilience of Bank Liquidity Ratios in the Presence of a CBDC](#)

In May 2022, the Bank of Canada published a paper studying the potential impact of a CBDC on bank liquidity, using pre-pandemic data. Although the results of the research represent an upper-bound estimate of how a CBDC could influence bank liquidity, it is found that Canadian banks should still adhere to their regulatory liquidity requirements even after a cash-like retail CBDC is issued. This need is ascribed to the banks’ large liquidity holdings and diversified funding portfolios.

## [Payment and Settlement Systems Department, Bank of Japan](#)

Although not planning to issue a CBDC anytime soon, the Bank of Japan (BOJ) conducted ‘Proof of Concept (POC) Phase 1’ from April 2021 to March 2022, as part of ensuring an appropriate response to any future changes in the CBDC space. In this proof-of-concept, they examined the trade-offs of three CBDC design alternatives.

## **European Central Bank Reports**

In May 2022, the ECB released a study on [Central Bank Digital Currency and Bank Intermediation](#). The paper analyses how the adoption of a digital euro might affect European banks’ balance sheets and activity, by developing illustrative take-up scenarios and explaining the balance sheet mechanics through which the digital euro would be introduced. Finally, it is stated that, on the basis of bank-level data, a digital euro can affect bank intermediation if imperfections and constraints surface and that its potential impact on economy-wide bank run dynamics depends on usage limits and remuneration, among other factors.

Later, in August 2022, the ECB released another a paper, [Towards the Holy Grail of Cross-Border Payments](#). The paper reviews how cross-border payments can be immediate, cheap, universal, and settled in a secure settlement medium all at once and suggests that the interlinking of domestic instant payment systems and future CBDCs, both with a competitive foreign exchange (FX) conversion layer, may have the greatest possibility of achieving the above.

## **Hong Kong Monetary Authority, e-HKD: A Policy and Design Perspective**

In April 2022, the Hong Kong Monetary Authority (HKMA) released a study on the possible introduction of e-HD and its uses, potential benefits and challenges, its design, as well as legal considerations. Among their conclusions, they state that the prevalence of e-HKD at the expense of physical cash may cause implications, like rendering the payment system more vulnerable to cyber-attacks and power/network outages and unwillingly intensifying the competition in the retail payment landscape. Moreover, the paper states that despite the potential switching of the holders from deposit to e-HKD, which could lead to bank disintermediation, the run risk for banks in Hong Kong would be very low, given depositors’ confidence in the deposit protection scheme and the HKMA’s regulations and oversight.

## **Federal Reserve Board, Retail CBDC and U.S. Monetary Policy Implementation: A Stylised Balance Sheet Analysis**

In this paper, the Federal Reserve Board examines how a Federal Reserve-issued retail CBDC could affect U.S. monetary policy implementation. The analysis is based on a set of assumptions, like defining retail CBDC as a liability of the central bank that is only available to U.S. households and businesses and that the introduction of a retail CBDC takes place at a time when the Federal Reserve is operating with an ample supply of reserve balances and the retail CBDC is unremunerated. Moreover, the paper explores the implications of a retail CBDC for monetary policy implementation, at a time when its adoption is widespread by U.S. individuals and small businesses as a means of payment and a store of value.

## **Office of Financial Research, CBDC: Stability and Information**

In this paper, the Office of Financial Research discusses how stability in CBDCs can be achieved and how information can contribute to it. The paper provides a different set of solutions to those already suggested for decreasing the risk of CBDC being held onto during times of financial turmoil, which could increase the likelihood of runs on banks and other financial intermediaries. The solutions already proposed suggest imposing caps, graduated fees, and other restrictions on CBDCs or making holding CBDCs a risky venture to discourage their excessive use. However, the paper argues that there are other, more harmless solutions to mitigate these financial stability concerns, highlighting that information about inflows into CBDC could affect policymakers’ beliefs about the state of the financial system, the motivations behind the actions of depositors, and what makes them withdraw.

## **The World Bank, Environmental Implications of a CBDC**

In May 2022, the World Bank released a paper on the potential environmental impact of the implementation of CBDCs. The paper highlighted three key points; the EAP region should be extremely careful about the possible implementation of a CBDC, since this region is one of the key contributors to rising greenhouse gas emissions and there are already six countries there that have been identified as the most vulnerable to climate change. Secondly, the environmental impact of a CBDC can vary based on the design choice of the CBDC. Last but not least, since CBDC is not a single technology and can be combined both with blockchain and digital payment solutions, the choice of technology to be combined with CBDC must meet not only strategic but environmental goals too.

**Barclays Bank, An Illustrative Industry Architecture to Mitigate Potential Fragmentation across CBDC and Commercial Bank Money**

Barclays Bank released a paper in March 2022, highlighting that, depending on the design of a CBDC, there is a high risk of fragmentation in payments markets and retail deposits, and introduced an illustrative industry architecture aiming to tackle the aforementioned risks. This illustrative industry architecture utilises and extends the Bank of England’s platform model for CBDC provision, adheres to the Bank of England’s currently identified system characteristics on potential technologies for a CBDC infrastructure, and introduces the concept of ecosystems that provide a common programmability layer across CBDC and commercial bank money, to lower the risk of fragmentation in payments markets and retail deposits.

**A Visualisation of the State of CBDCs by the Visual Capitalist**

Using data from the Atlantic Council’s currency tracker, in August 2022, the Visual Capitalist published an article with infographics on the current situation of CBDC across the world. Indicatively, as you can see below, most of the countries examined worldwide are still exploring CBDCs at a research stage, while only 9% of the countries remain inactive.



In Europe, most of the uses are for retail CBDC and most countries are running a pilot or development stage.





East Asia mostly operates in pilot mode for a retail CBDC and a retail & wholesale CBDC, while Australia is at the development stage for retail and wholesale CBDC.



In the Middle East and Central Asia, most of the programmes running at the moment are in pilot and development mode. A significant majority of the programmes in the development phase are on a retail CBDC, while there is a wholesale program in the pilot stage and another one in the research stage.



In South America, 6 out of 11 states are working on a retail CBDC. The biggest part of South America is at the development stage, while there is a significant proportion that remains inactive.



Finally, in North America, including Central America and the Caribbean, the majority of the states are working on a retail CBDC and they, almost equally, are operating in the research or development stage.



## Further Reading

- [South African Reserve Bank, Project Khokha](#)
- [BIS, CBDCs in emerging market economies](#)
- [International Monetary Fund, Cross-Border Central Bank Digital Currencies, Bank Runs and Capital Flows Volatility](#)
- [Monetary Policy & The Economy Q1-Q2 2022, A digital euro and the future of cash](#)
- [BIS Innovation Hub Hong Kong Centre, Inthanon-LionRock to mBridge, Building a multi CBDC platform for international payments](#)
- [BIS, Central bank digital currencies – executive summary](#)
- [Public Policy Principles for Retail Central Bank Digital Currencies \(CBDCs\)](#)
  
- [Bank of Canada, The positive case for a CBDC](#)
- [International Journal of Central Banking, Broadening Narrow Money: Monetary Policy with a Central Bank Digital Currency](#)
- [De Nederlandsche Bank, What triggers consumer adoption of CBDC](#)
- [European Central Bank, Central Bank Digital Currency: functional scope, pricing, and controls](#)
- [European Central Bank, Digital euro experimentation scope and learnings](#)
- [Sveriges Riksbank, On the possibility of a cash-like CBDC](#)
- [Swiss National Bank, how to issue a central bank digital currency](#)
- [US Federal Reserve, Private Money and Central Bank Money as Payments Go Digital: An Update on CBDCs](#)