

Central bank digital currencies: The next disruptor

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Businesses and consumers are adapting to digital forms of monetary interactions faster than ever imagined. Widespread digitization of economies and a growth of decentralized digital currencies have acted as a catalyst for central banks to rethink “money.”

In this document, we lay out the drivers and key design considerations for central bank digital currencies (CBDCs), an electronic form of central bank money, and the corresponding impact on commercial banks. In addition to “issuing” CBDCs, what else will a central bank need to consider when designing a CBDC? How will these decisions affect commercial banks? While there is no single answer, it is evident that the evolution of CBDCs will have profound ripple effects for the whole financial ecosystem.

Introduction to CBDCs

A CBDC is an electronic form of central bank money with potential wide use by households and businesses to store value and make payments. It is central bank digital money in the national unit (e.g., the US dollar) representing legal tender with the liability of the central bank, similar to physical currency in circulation. This makes CBDCs more secure and less volatile than other digital currencies. The following table presents an overview of the purpose of and common misconceptions about CBDCs.

CBDC is...

- Traditional money, but in digital form;
- Issued and governed by a country's central bank;
- Influenced in terms of supply and value by a country's monetary policies, trade surpluses, and central bank; and
- Based on a digital ledger, and may or may not leverage blockchain or distributed ledger technology.

CBDC is not...

- Cryptocurrency (like Bitcoin) governed by distributed autonomous communities instead of a centralized body;
- Value-dependent and determined entirely by the market; or
- Equivalent to electronic cash (e.g., balance in a digital wallet or a prepaid card) with claim against an intermediary such as a commercial bank.

CBDCs are rapidly evolving, and different central banks can take different approaches in implementation. There are a number of design decisions that lack broad consensus, including the following:

- Ability of CBDCs to completely replace notes and coins
- Degree of anonymity or privacy
- Access and availability
- Interest-bearing ability

Overall, CBDCs would offer both a new form of central bank money and a paradigm change in payments infrastructure. Hence, it becomes important to understand the benefits of CBDCs and their impacts on the wider payments landscape.

For an exploration of policy and regulatory considerations for CBDCs, see Deloitte's paper, [Central Bank Digital Currencies \(CBDC\): Regulatory and policy considerations in the US](#).

Drivers of CBDCs

The need for CBDCs is driven by the rapid digitization of economies, push for real-time payments and settlement, and need for more efficient domestic and cross-border monetary interactions. According to the International Monetary Fund (IMF), centralized technology such as CBDCs can reduce expenses, facilitate seamless flow of money, improve financial inclusion, and provide safer access to money through digital channels. On the other hand, many central banks are also realizing the increasing influence of digital currencies and are concerned about potential impacts on the financial system.

We have identified the following four key drivers that have pushed central banks to explore CBDCs:

1 Supporting digitization of economies CBDCs could:

- Help maintain and streamline central banks' function of providing legal tender and ensuring continued access in a purely digital economy; and
- Offer access to digital payments at minimum or zero cost via a new general-purpose electronic payment medium.

2 Streamlining current payment systems CBDCs could:

- Improve payment contestability by reducing operational costs and risks associated with managing physical currency;
- Lower barriers to entry by building an open infrastructure to foster innovation and participation from private players;
- Help improve the efficiency of payment systems, both at point of sale (POS) and peer-to-peer (P2P); and
- Help improve interbank payments through faster settlements and open or extended settlement hours.

3 Enhancing monetary and fiscal policy CBDCs could:

- Improve monetary policy for central banks, simplifying the distribution of government benefits to individuals and improving control over transactions for tax controls;
- Enhance financial stability by managing liquidity squeezes and offering public alternatives to private digital currencies; and
- Enable central banks to tap into more granular payment flow data across an economy, enhancing macroeconomic data integrity and analytics.

4 Improving financial inclusion CBDCs could:

- Provide a tool to improve the competitiveness of local currency as a means of payment in regions that are attempting to reduce US dollar dependency;
- Be distributed through mobile devices, with some proofs of concept having accomplished this without need of a bank account; and
- Help bring the unbanked population of around 2 billion (as of 2020) into the global financial system.¹

Overall, CBDCs would provide a more resilient payments landscape, supporting competition, efficiency, controls, and innovation in payments. They would also address declining cash usage by improving the usability and availability of legitimate central bank money.²

Design considerations for CBDCs

Central banks around the globe are exploring variations in CBDC design while weighing factors such as access, privacy, and distribution method. There are two common design formats for CBDCs: token-based and account-based. Each approach has a different technical infrastructure, as well as varying levels of access and privacy.

Token-based CBDCs use a digital token, and access and claims require users to have knowledge of the token (public-private key pair). This approach typically offers a high degree of anonymity; however, central banks can choose to implement identity requirements to use the network. Token transfers rely on the sender's ability to verify the validity of the payment object and therefore require a form of distributed ledger technology for verifying the chain of ownership in each token and validating payment transactions. This also means higher end-user risk of losing a key or token held in a noncustodial wallet. In a token-based approach, commercial banks would need to be the first line of defense for compliance with know your customer (KYC) and anti-money laundering/combatting the financing of terrorism (AML/CFT) regulations. This method can provide universal access to CBDCs, but also makes law enforcement more challenging compared with other designs.

Account-based CBDC access and claims are linked to a bank account tied to the identity of the account holder. This method is challenging for universal access because it still requires a banking relationship. To transfer funds, banks would process each payment by debiting the sender's CBDC account and crediting the beneficiary's CBDC account. Transactions need to be verified using user identities, and therefore, robust identity management systems are required to maintain a unique identifier per individual across payment systems. In an account-based approach, compliance with KYC and AML/CFT regulation is the responsibility of the central bank. Verification of transfers in an account-based system depends on establishing appropriate safeguards against identity theft, fraud, and unauthorized transfers from valid accounts.

There are many design considerations, including distribution, access, and privacy, that need to be carefully considered to determine the right CBDC implementation. Reviewing lessons learned from existing CBDC and crypto approaches, intended benefits, and trade-offs can help a central bank determine the best approach.

Current global landscape of CBDCs

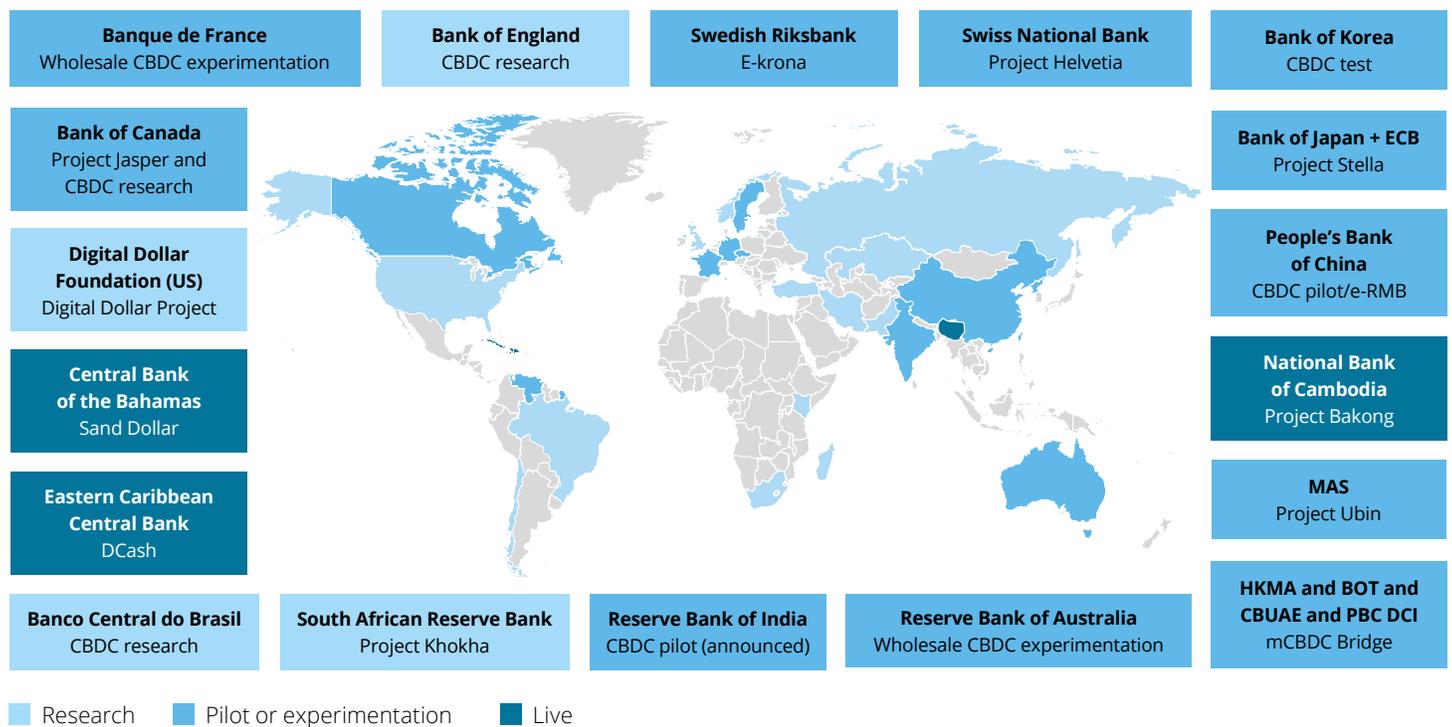
CBDCs are not just a theoretical concept; there are live CBDCs and many proofs of concept globally, as depicted in figure 1. Key highlights include:

- More than 60 central banks are exploring CBDCs at varying levels of maturity.³
- 14% of central banks are moving forward to development and pilot arrangements.⁴
- Three retail CBDC projects are live (Bahamas Sand Dollar, Bakong Cambodia, and Eastern Caribbean DCash).

Though countries like China, Sweden, Canada, and the United Kingdom have led research and pilot projects in the past few years, the actual execution of CBDC pilots is being led by smaller nations. In late 2020, the Central Bank of the Bahamas launched the Sand Dollar, a digital currency backed by that nation's central bank. The Sand Dollar has facilitated easier monetary transactions across an otherwise vast archipelago. It is also meant to improve ease of transaction, service delivery costs, and financial inclusion. The Bank started experimenting with the CBDC in 2019.⁵

Research and pilot CBDC projects are showing promising results over a short time span. Globally, 14% of central banks are close to implementation, and the success of pilot projects will further motivate others to explore. With great opportunities to enhance monetary and fiscal policy, central banks are giving considerable attention to CBDCs, and in turn, the rest of the financial ecosystem will need to be ready to adjust.

Figure 1. Global CBDC landscape



As of April 2021.

Impact of CBDCs on commercial banks

Commercial banks are focused heavily on customer-facing operations, secure transactions, and regulatory reporting and are, given CBDC design decisions, essential partners in successfully rolling out a CBDC. CBDCs introduce an electronic form of central bank money, adding significant complexity for commercial banks, and may imply a drastic change across the organization to keep up with the need to innovate compatible products.

As central banks embark on the digital currency journey with CBDCs, it could lead to a paradigm shift in the way domestic and global economies operate. While there is a lot yet to be determined, the design of a CBDC will have implications for the entire financial ecosystem.

Depending on CBDC design, commercial banks will need to plan for changes in the following areas:

Key impact	High-level scope of changes
Business model Benefit from CBDC	<ul style="list-style-type: none"> • Banks could innovate current products and services across portfolios to leverage and adjust to CBDC opportunities and behaviors (for example, designing an offline payment infrastructure or electronic vault to store CBDCs for large institutions). • The rollout of a CBDC would generate large amounts of transaction data that can open opportunities for analysis and new real-time economic insights. • If central banks go the way of account-based design, it will disintermediate correspondent banking networks, as central banks would directly provide liquidity in each market.
Regulation Maintain compliance	<ul style="list-style-type: none"> • Banks will need to maintain compliance with AML, KYC, and custodian-related regulation. • Existing legal frameworks may be reformed based on CBDC design.
Technology Evolve infrastructure and interfaces	<ul style="list-style-type: none"> • Banks may need to adapt their infrastructure to process CBDC transactions; enhance digital apps to introduce CBDC functionality, leveraging existing processes; evolve customer interfaces; and enable open, compatible infrastructure (e.g., digital wallets) or hardware (i.e., physical cards). • For cross-border, FX transactions, or multicurrency wallets, banks may also need to manage designs unique to individual CBDCs.
Identity management Verify transactions	<ul style="list-style-type: none"> • Depending on the design decisions of a central bank, commercial banks may need to create real-time infrastructure for identity and access management.
Cybersecurity Proactively prevent cyberthreats	<ul style="list-style-type: none"> • Customer privacy and data security are expected to become key concerns due to cybersecurity threats and vulnerabilities.
Financial reporting Navigate tax changes	<ul style="list-style-type: none"> • Different accounting rules and audit and financial reporting requirements are expected for CBDC transactions.
Talent Reorganize for change	<ul style="list-style-type: none"> • Organizations may need to develop training required to manage CBDC-related processes, technologies, and regulation.

Next steps

The introduction of CBDCs is a disruptor for the financial ecosystem, promoting payment efficiency and representing an additional alternative to the current money model from an operational and technological point of view. Central banks are moving rapidly toward implementation, and therefore, commercial banks should use this time to explore the digital currency landscape and reimagine it for emerging services, opportunity, and value creation.

Endnotes

1. World Bank Global Partnership for Financial Inclusion, "[G20 Financial Inclusion Indicators](#)," accessed August 26, 2021.
2. Ledger Insights, "[Bank of England releases Central Bank Digital Currency research roadmap](#)," March 12, 2020.
3. Bank for International Settlements (BIS), "[Central banks of China and United Arab Emirates join digital currency project for cross-border payments](#)," February 23, 2021.
4. Ibid.
5. Vipin Bharathan, "[Central Bank Digital Currency: The First Nationwide CBDC In The World Has Been Launched By The Bahamas](#)," *Forbes*, October 21, 2020.

Authors and contributors

Chris Allen

Managing director
Deloitte Consulting LLP
chrallen@deloitte.com

Kairavi Bavishi

Manager
Deloitte Consulting LLP
kabavishi@deloitte.com

Pinaki Dhal

Senior manager
Deloitte Consulting LLP
pdhal@deloitte.com

Arjun Gupta

Manager
Deloitte Consulting LLP
arjgupta@deloitte.com.au

Sohail Kagzi

Managing director
Deloitte Consulting LLP
skagzi@deloitte.com

Kelvin Li

Senior consultant
Deloitte Consulting LLP
kelvili@deloitte.com

Sharanya Mahadevan

Consultant
Deloitte Consulting LLP
shamahadevan@deloitte.com

Shrey Nagrath

Analyst
Deloitte Consulting LLP
shnagrath@deloitte.com

Rhonda Nassar

Manager
Deloitte Consulting LLP
rhassar@deloitte.com

Alan Schwartz

Senior consultant
Deloitte Consulting LLP
alschwartz@deloitte.com

Pooja Sharma

Senior consultant
Deloitte Consulting LLP
poojasharma8@deloitte.com

Richard Walker

Principal
Deloitte Consulting LLP
richardwalker@deloitte.com



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