

5. Central Bank Digital Currencies (CBDC)

Challenging the financial system as we know it

Central Bank Digital Currencies have become a topic of debate not only in the academic field but also within national and supranational authorities that have set internal teams in order to analyze their potential implications. Although improbable in a short term, Distributed Ledgers allow for their existence in the future.

What CBDCs are

Money has been traditionally defined as a financial asset that serves three distinct roles: as a medium of exchange, a store of value, and a unit of account. Several types of money coexist under this definition -- cash, checking accounts, bank reserves in the central bank, foreign currency, money market securities, short-term repurchase agreements, and privately issued assets -- each with their own set of strengths and weaknesses when fulfilling their roles.

One can observe that most money has already been digitized, a process made easy when it is redeemable¹³. The reason rests on the nature of redeemable money, which relies on the trust put on its issuer together with its non-anonymity, which is an additional safeguard that facilitates proof of ownership in court. As a result, the digitization of redeemable money has evolved quite naturally: it has proven relatively easy for already trusted issuers to gain the institutional support and additional trust needed to offer and guard solely digitized versions of the money they supply.

Nevertheless, being the bulk of money in the form of private banks' deposits, cash is still the cornerstone of money supply. Its strength lies in three distinguishing attributes that have upheld it as the world's quintessential means of payment: universality, anonymity and peer-to-peer exchangeability¹⁴. A fourth key attribute, no yield bearing, has additionally fueled the role of cash as a unit of account. But, despite its widespread use and convenience, cash has many drawbacks: it is the main instrument of tax evasion, money laundering and the financing of illegal activities; it deteriorates rapidly, especially in high inflation countries, posing significant logistical problems; it limits the scope for monetary policies based on negative interest rates, since it provides a zero rate alternative that can be stored; etc.

Those are the reasons why "digital cash" has been pursued for decades. However, preserving cash attributes within a digitized platform has proven to be significantly challenging until 2008, when distributed ledgers (DL), a generalization of the blockchain technology popularized by Bitcoin, offered the key to digitize cash. More specifically, DL offered a solution for the "double spending problem" by founding a decentralized way to assure that no one could ever spend twice his or her withholding of cash¹⁵. As a consequence, technology now provides a way for central banks to issue a digital cash alternative in the form of central bank digital currencies (CBDCs). Recent literature explores this option,

13: I.e., it is a contract that stipulates that the bearer can redeem from the issuer a given amount of a specified asset, usually cash.

14: I.e., it does not require the intervention of a third party.

15: Through a combination of algorithms and cryptography operated in an open network, DL decentralizes the supervision of the balances in all accounts, which in the context of crypto currencies are called "wallets". A digital wallet is actually a pair of two cryptographic keys (one public and one private) which gives access to the funds in the form of crypto currency. The word "wallet" is used as analogy to physical wallets where bills and coins are stored.

with the objective of overcoming the drawbacks of cash and also, in the view of some authors, as a means by which banking crises can be limited, by providing a central bank-based alternative to private banks' deposits.

The Bank of England was among the first central banks to take notice of the feasibility of CBDCs, followed by Canada, China, Senegal, South Africa, Sweden, and many others that are currently assessing and piloting its implementation.

The many flavours (and implications) of CBDCs

Different types of CBDCs can be defined to replicate all or some of the main features of physical cash, with different implications. We identify four main scenarios, from least to most disruptive (more detail in [this report](#)):

The most simple option is the use of CBDCs only for wholesale payment systems (**option A**). Under this scheme the CBDC would be held by banks and other participants in wholesale payment systems (but not by the general public), identified (as opposed to anonymous) and non-interest bearing. This scenario would increase the efficiency of wholesale payment systems, and has few drawbacks for the public at large or for policy makers, although banks could be hit due to higher competition with non-bank payment institutions.

Option B opens the CBDC scheme to the general public, and retains the anonymity of cash. The efficiency gains would exceed those of option A, as money transfers would no longer require intermediaries and it would, for example, facilitate long-distance payments. The payment business of banks would be severely hindered and their retail funding could be lower and more volatile, which would pressure down credit levels. However, the CBDC would be less secure than bank deposits, which offer both additional safeguards and traceability in case of legal disputes, aside from potentially offering higher yield and complementary services.

Option C introduces the possibility of CBDCs bearing non-zero interest rates. It hugely increases the room for anti-deflationary policies, through the use of negative interest rates. It would imply the elimination of cash, except perhaps for very low denominations: negative rates would remain bounded if cash is readily exchangeable with CBDC (for a low enough rate, everyone would swap into cash) while demand for cash would dry up for a high enough positive yield. The advantages of broader policy making should be balanced against the legitimacy issues that central banks would face as a result of potentially implementing unbounded financial repression. As in scenario B, banks would be negatively hit as people converted their bank deposits into CBDCs, with a potential cost for society in terms of credit. However, the restrictions in the usage of physical cash could drive up bancarization.

Finally, **option D** centres on a non-anonymous and universal CBDC. Identification would make this CBDC equivalent to a deposit at a central bank, increasing its security while granting higher surveillance power to policy makers to fight illicit activities and tax evasion. This scheme in particular would certainly disrupt retail banking, because commercial banks would face direct competition from central banks and a type of narrow banking model would likely emerge, with the resulting threat to aggregate credit. Unless the monetary authority is willing to take a new role as manager/investor of CBDC, which is hard to fathom, or outsource such responsibility to the financial sector, although it is not yet obvious how and under what criteria, CB deposits would be hoarded rather than channeled into investment.

A clear advantage shared by all four basic CBDC schemes is the significant reduction in the intermediation costs of the domestic-payment infrastructure. As a result, financial firms relying on the provision of intermediation services are likely to become obsolete or commoditized unless they develop alternative sources of revenue. Also, regardless of the scheme, physical cash would retain certain advantages, such as its ease of use by the “digitally uninformed”, availability “outside the grid” and trust in an asset that is completely shielded from “singled out” confiscation. Moreover, the cost to both instruct everyone and provide access everywhere may prove insurmountable to many authorities, especially in emerging economies.

We think that the less disruptive scenarios are more likely, because of their ease of implementation and because the authorities would be reluctant to choose more disruptive schemes given their potential costs and the uncertainty about their impact. This naturally conservative bias of central banks would probably give rise to an evolutionary approach, with scenario A being likely in the short to medium run, whereas the probability of other options would depend a lot on the weighting of different objectives by both central banks and authorities in general.

And there is still the main significant implication about how to solve the severe threat to today's maturity transformation of deposits into investment. One undeniable point is that modern economies currently count on the credit generated by the maturity transformation of deposits, and a reduction in deposits would disrupt the flow of available credit, generating significant transition costs, regardless of alternative channels from savings to credit that narrow banking may or may not foster.

DISCLAIMER

This document has been prepared by BBVA Research Department, it is provided for information purposes only and expresses data, opinions or estimations regarding the date of issue of the report, prepared by BBVA or obtained from or based on sources we consider to be reliable, and have not been independently verified by BBVA. Therefore, BBVA offers no warranty, either express or implicit, regarding its accuracy, integrity or correctness.

Estimations this document may contain have been undertaken according to generally accepted methodologies and should be considered as forecasts or projections. Results obtained in the past, either positive or negative, are no guarantee of future performance.

This document and its contents are subject to changes without prior notice depending on variables such as the economic context or market fluctuations. BBVA is not responsible for updating these contents or for giving notice of such changes.

BBVA accepts no liability for any loss, direct or indirect, that may result from the use of this document or its contents.

This document and its contents do not constitute an offer, invitation or solicitation to purchase, divest or enter into any interest in financial assets or instruments. Neither shall this document nor its contents form the basis of any contract, commitment or decision of any kind.

In regard to investment in financial assets related to economic variables this document may cover, readers should be aware that under no circumstances should they base their investment decisions in the information contained in this document. Those persons or entities offering investment products to these potential investors are legally required to provide the information needed for them to take an appropriate investment decision.

The content of this document is protected by intellectual property laws. It is forbidden its reproduction, transformation, distribution, public communication, making available, extraction, reuse, forwarding or use of any nature by any means or process, except in cases where it is legally permitted or expressly authorized by BBVA.

This report has been produced by the Digital Regulation Unit:

Chief Economist for Digital Regulation Unit

Álvaro Martín
alvaro.martin@bbva.com
+ 34 91 537 36 75

María Álvarez
maria.alvarez.caro@bbva.com

Alicia Sánchez
alicia.sanchezs@bbva.com

Vanesa Casadas
vanesa.casadas@bbva.com

Javier Sebastián
jsebastian@bbva.com

Edward Corcoran
Edward.corcoran@bbva.com

Ana Isabel Segovia
ana.segovia@bbva.com

Jesús Lozano
jesus.lozano@bbva.com

Pablo Urbiola
pablo.urbiola@bbva.com

BBVA Research

Group Chief Economist

Jorge Sicilia Serrano

Macroeconomic Analysis

Rafael Doménech
r.domenech@bbva.com

Global Macroeconomic Scenarios

Miguel Jiménez
mjimenezg@bbva.com

Global Financial Markets

Sonsoles Castillo
s.castillo@bbva.com

Global Modelling & Long Term Analysis

Julián Cubero
juan.cubero@bbva.com

Innovation & Processes

Oscar de las Peñas
oscar.delaspenas@bbva.com

Financial Systems & Regulation

Santiago Fernández de Lis
sfernandezdelis@bbva.com

Countries Coordination

Olga Cerqueira
olga.gouveia@bbva.com

Digital Regulation

Álvaro Martín
alvaro.martin@bbva.com

Regulation

María Abascal
maria.abascal@bbva.com

Financial Systems

Ana Rubio
arubiog@bbva.com

Financial Inclusion

David Tuesta
david.tuesta@bbva.com

Spain & Portugal

Miguel Cardoso
miguel.cardoso@bbva.com

United States of America

Nathaniel Karp
Nathaniel.Karp@bbva.com

Mexico

Carlos Serrano
carlos.serranoh@bbva.com

Turkey, China & Geopolitics

Álvaro Ortiz
alvaro.ortiz@bbva.com

Turkey

Álvaro Ortiz
alvaro.ortiz@bbva.com

China

Le Xia
le.xia@bbva.com

South America

Juan Manuel Ruiz
juan.ruiz@bbva.com

Argentina

Gloria Sorensen
gsorensen@bbva.com

Chile

Jorge Selaive
jselaive@bbva.com

Colombia

Juana Téllez
juana.tellez@bbva.com

Peru

Hugo Perea
hperea@bbva.com

Venezuela

Julio Pineda
juliocesar.pineda@bbva.com

CONTACT DETAILS: BBVA Research: Azul Street, 4. La Vela Building - 4 and 5 floor. 28050 Madrid (Spain). Tel.: +34 91 374 60 00 y +34 91 537 70 00 / Fax: +34 91 374 30 25 - bbvaresearch@bbva.com www.bbvaresearch.com