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CBDC and stablecoins: Early coexistence on an uncertain road

With the rapid rise in circulation of stablecoins over the past couple of years, central banks have stepped up efforts to explore their own stable digital currencies.

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Cryptocurrency has been touted for its potential to usher in a new era of financial inclusion and simplified financial services infrastructure globally. To date, however, its high profile has derived more from its status as a potential store of value than as a means of financial exchange. That disconnect is now evolving rapidly with both monetary authorities and private institutions issuing stabilized cryptocurrencies as viable, mainstream payments vehicles.

The European Central Bank announced recently it was progressing its 'digital euro' project into a more detailed investigation phase.¹ More than four-fifths of the world's central banks are similarly engaged in pilots or other central bank digital currency (CBDC) activities.² Concurrently, multiple private, stabilized cryptocurrencies—commonly known as stablecoins—have emerged outside of state-sponsored channels, as part of efforts designed to enhance liquidity and simplify settlement across the growing crypto ecosystem.

Although the endgame of this extensive activity that spans agile fintechs, deep-pocketed incumbents, and (mostly government-appointed) central banks remains far from certain, the potential for significant disruption of established financial processes is clear. Against this backdrop we offer a fact-based primer on the universe of collateralized cryptocurrency, an overview of several possible future scenarios including potential benefits and obstacles, and near-term actions that participants in today's financial ecosystem may consider in order to position themselves.

The digital currency landscape

The basic notion of a digital currency (replacing the need for paper notes and coins as a means of exchange with computer-based money-like assets) dates back more than a quarter of a century. Early efforts at creating digital cash—such as DigiCash (1989) and e-gold (1996)—were issued by central agencies. The emergence of Bitcoin in 2009 dramatically altered this model in two important ways: by establishing a decentralized

(blockchain-based) ledger for transaction execution and record keeping, and by creating a (now) widely traded currency outside the control of any sovereign monetary authority. Thousands of similar decentralized cryptocurrencies now exist, collectively generating billions of dollars in global transaction volume every day.

Although the aggregate market value of such cryptocurrencies now exceeds \$2 trillion, extreme price volatility, strong price correlation to Bitcoin, and often slow transaction confirmation times have impeded their utility as a practical means of value exchange. Stablecoins aim to address these shortcomings by pegging their value to a unit of underlying asset, often issued on faster blockchains, and backing the coins wholly or partially with state-issued tender (such as the dollar, pound, or euro), highly liquid reserves (like government treasuries), or commodities such as precious metals. Collectively, nearly \$3 trillion in stablecoins such as Tether and USDC were transacted in the first half of 2021 (Exhibit 1).

With the rapid rise in circulation of stablecoins over the past couple of years, central banks have stepped up efforts to explore their own stable digital currencies (Exhibit 2). Some efforts to create CBDCs have been born out of reservations about the impact of privately issued stablecoins on financial stability and traditional monetary policy, and with the goal of improving access to central bank money for private citizens, creating greater financial inclusion and reducing payments friction.

Various public statements indicate that central banks envision CBDCs as more than simply a digital-native version of traditional notes and coins. Beyond addressing the challenge of greater financial inclusion, some governments view CBDCs as programmable money—vehicles for monetary and social policy that could restrict their use to basic necessities, specific locations, or defined periods of time.

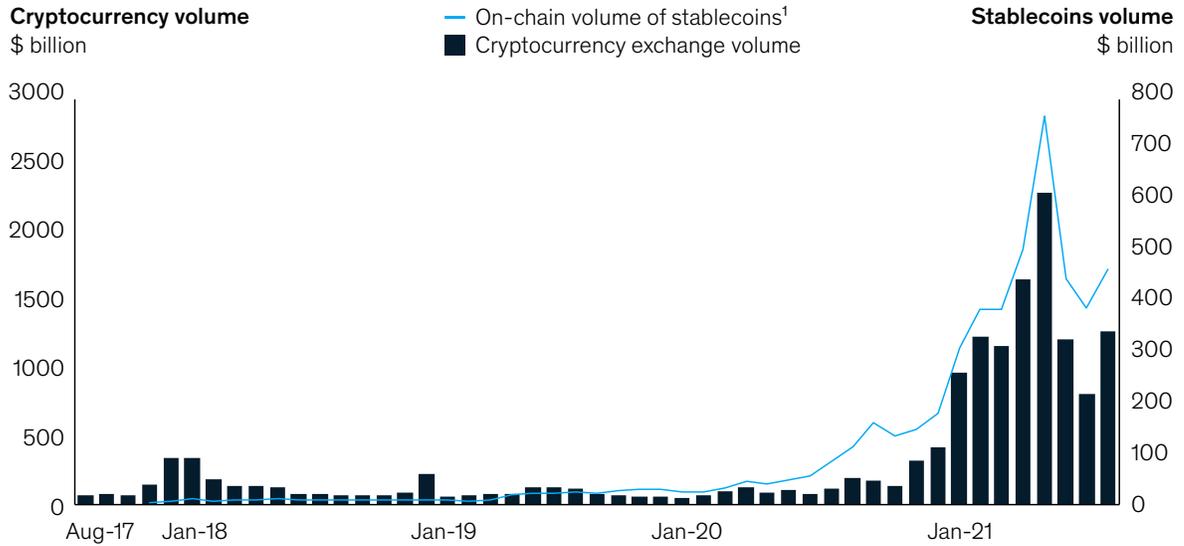
Implementing such functionality will be a complex and multilayered undertaking. Meanwhile, central

¹"Eurosystème launches digital euro project," press release, European Central Bank, July 2021, [ecb.europa.eu](https://www.ecb.europa.eu).

²Codruta Boar and Andreas Wehrli, *Ready, steady, go? Results of the third BIS survey on central bank digital currency*, Bank for International Settlements, BIS Papers, number 114, January 2021, [bis.org](https://www.bis.org).

Exhibit 1

The rise in circulation of stablecoins has closely tracked the volume of cryptocurrencies traded on exchanges over the past three years.

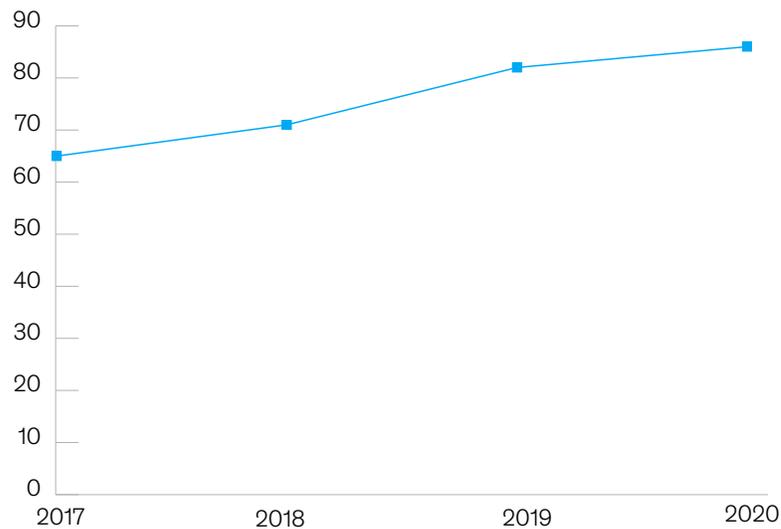


¹Volume of stablecoins exchanged represents all transactions recorded on the relevant blockchains. These volumes are distinct from the volume of crypto traded on exchanges, some of which may be transacted between accounts off-chain.
Source: Theblockcrypto.com

Exhibit 2

The proportion of central banks actively engaged in CBDC work is growing.

Share of respondents conducting work on CBDCs, %



Source: Codruta Boar and Andreas Wehrli, "Ready, steady, go? – Results of the third BIS survey on central bank digital currency," Bank for International Settlements, January 2021, bis.org.

banks face the challenge of introducing a timely CBDC model at least on par with digital offerings of private-sector innovators in order to establish credibility with such efforts and achieve adoption. While existing electronic payment systems are considered by some to be expensive, inefficient, and at times difficult to access,³ emerging privately issued stablecoin alternatives could raise concerns over the potential for large private entities to aggregate—and monetize—large sets of behavioral data on private citizens.

Potential future scenarios: Coexistence or primacy?

It is too early to confidently forecast the trajectory and endgame for CBDCs and stablecoins, given the multitude of unresolved design factors still in play. For instance, will central banks focus first on retail or wholesale use cases, and emphasize domestic or cross-border applications? And how rapidly will national agencies pursue regulation of stablecoins prior to issuing their own CBDCs?

To begin to understand some of the potential scenarios, we need to appreciate the variety and applications of CBDCs and stablecoins. There is no single CBDC issuance model, but rather a continuum of approaches being piloted in various countries. One design aspect hinges on the entity holding CBDC accounts. For instance, the account-based model being implemented in the Eastern Caribbean involves consumers holding deposit accounts directly with the central bank. At the opposite end of the spectrum, China's CBDC pilot relies on private-sector banks to distribute and maintain eCNY (digital yuan) accounts for their customers. The ECB approach under consideration involves licensed financial institutions each operating a permissioned node of the blockchain network as a conduit for distribution of a digital euro. In a potential fourth model popular within the crypto community but not yet fully trialed by central banks, fiat currency would be issued as anonymous fungible tokens (true digital cash) to protect the privacy of the user.

By comparison, stablecoins such as the dollar-denominated USDC are issued across multiple public, permissionless blockchains. Any individual can operate a node of an issuing blockchain such as Ethereum, Stellar, or Solana; and anyone can transfer stablecoins between pseudonymous wallets around the world. While most exchanges today require users to complete thorough Know Your Customer (KYC) identity checks, no central registry for users or single ledger for tracking ownership of stablecoins currently exists, potentially complicating identity considerations.

Many see the current development of CBDCs as a response to the challenge private-sector stablecoins could pose to central bank prerogatives, and as evidence of the desire of institutions to address long-term goals such as payment systems efficiency and financial inclusion. Cash usage in many countries continues to dwindle, while the cost to maintain its infrastructure does not. Similarly, many countries' existing electronic payment systems are relatively inefficient to operate and often not instantaneous or 24/7. Perhaps most importantly, proper deployment of a regulated digital currency accessible through mobile devices without the need for a formal bank account could potentially enhance payments security and efficiency (ensuring transaction finality through distributed consensus with private key cryptography), while satisfying central banks' goal of increasing financial inclusion and advancing the public good.

By contrast private stablecoins have flourished, perhaps in part through being unencumbered by such an expansive mission. They've delivered value as a source of liquidity in the crypto ecosystem, often providing a "safe haven" for investors during times of heightened volatility by obviating the need to enlist a regulated venue to convert cryptocurrency holdings back into fiat deposits. Indeed, the emergence and growth of supply of the prominent stablecoin Tether first coincided with the rapid increase in cryptocurrency transaction volume

³"From the payments revolution to the reinvention of money," speech by Fabio Panetta, Member of the Executive Board of the ECB, at the Deutsche Bundesbank conference on the "Future of Payments in Europe," Frankfurt, November 27, 2020.

on exchanges in late 2017, many of which did not have fiat licenses.

Stablecoins are typically collateralized by professionally audited reserves of fiat currency or short-term securities. They play a role today not just as “crypto reserves” but also as a source of liquidity across decentralized finance (DeFi) exchanges. Stablecoins, unlike the proposed design of CBDCs, which are generally issued on private ledgers, can engage with smart contracts on public permissionless networks that enable decentralized financial services. Significantly, they provide a medium for the instantaneous movement of value between exchanges and digital wallets, often to take advantage of short-lived arbitrage opportunities, to settle bilateral over-the-counter (OTC) trades or to execute cross-border payments. This utility as a vehicle for payments is demonstrated by the more than \$1 trillion in stablecoin transaction volumes per quarter in 2021 (although this remains a fraction of traditional payment volumes cleared) and may grow to play an important role in the future of digital commerce ecosystems.

Although a solid case can be made for the coexistence of stablecoins and CBDCs (providing separate services such as DeFi services and liquidity provisioning, and direct access to central bank money, respectively), plausible scenarios could also lead to the long-term preeminence of either instrument. Some regulatory bodies have already expressed concern over substantial value flows settling via private stablecoins, implying potential actions to manage or curtail their use.⁴ Equally, full digitization of sovereign currencies could facilitate easier global trade flows. Given the notable proliferation of stablecoins over the past 12 months, however, private-sector networks have gained “first mover” advantage, increasing expectations for central banks to deliver timely solutions

providing sufficient convenience—or at minimum, a compelling vision—to create similar long-term value.

The current state of financial infrastructure in a given country will play a key role in determining the speed and extent of adoption of CBDCs, stablecoins, or non-stabilized cryptocurrencies. Those with limited present-day capabilities are prime candidates for a “leapfrog” event, similar to the rapid emergence of M-Pesa as a payments vehicle in sub-Saharan Africa⁵ or Alipay in China.⁶ In developed economies with existing real-time payments rails, the near-term incremental benefits of reduced (even instantaneous) settlement time from CBDCs may be somewhat muted if financial institutions are reluctant to invest in the necessary additional infrastructure. In these instances, distinct benefits of stablecoins (such as their ability to engage with smart contracts) may prove to be a more compelling and defensible use case over the longer term, depending on the exact CBDC implementation.

Residents of countries with sovereign currencies lacking historical stability have been among the most active adopters of cryptocurrencies as a means of exchange, especially where they are perceived as less risky than the available alternatives. Along with the potential for digital currencies to foster financial inclusion for citizens lacking access to traditional banking services (utilizing a universal digital wallet instead of a traditional fiat account), such an environment could serve as an indicator for a market primed for a potential leapfrog event (for example, the national acceptance of Bitcoin in El Salvador⁷).

Ultimately the fate of CBDCs and stablecoins may be decided by the significant forces of regulation and adoption. While CBDCs will be issued under the auspices of central banks, stablecoins are potentially subject to regulatory oversight from

⁴ Paul Vigna, “Risks of Crypto Stablecoins Attract Attention of Yellen, Fed and SEC,” *Wall Street Journal*, July 17, 2021, [wsj.com](https://www.wsj.com); Tory Newmyer, “SEC’s Gensler likens stablecoins to ‘poker chips’ amid call for tougher crypto regulation,” *The Washington Post*, September 21, 2021, [washingtonpost.com](https://www.washingtonpost.com).

⁵ Daniel Runde, “M-Pesa and the rise of the global mobile money market,” *Forbes*, August 12, 2015, [forbes.com](https://www.forbes.com).

⁶ Aaron Klein, “China’s Digital Payments Revolution,” Brookings, April 2020, [brookings.edu](https://www.brookings.edu).

⁷ Santiago Pérez and Caitlin Ostroff, “El Salvador becomes first country to adopt Bitcoin as national currency,” *Wall Street Journal*, September 7, 2021, [wsj.com](https://www.wsj.com).

⁸ “G20 confirm their support for the FATF as the global standard-setter to prevent money laundering, terrorist financing and proliferation financing,” Financial Action Task Force, April 7, 2021, [fatf-gafi.org](https://www.fatf-gafi.org).

multiple agencies, depending on their classification as assets, securities, or even money-market funds. Under scrutiny from the Financial Action Task Force, such regulation may be extended across borders.⁹ While it is too early to predict the impact of greater regulation on stablecoins, innovation continues apace with the likely emergence of many more (and newer) varieties in coming years. In contrast, early efforts to issue CBDCs have been met with only moderate adoption. For example, the equivalent of just over \$40 million in Chinese digital Yuan has thus far been distributed by lottery, and the People's Bank of China has reported around 70 million transactions since the launch of its limited multicurrency pilot in January 2021.⁹ While this represents a solid proof of concept, it compares with over two billion monthly active users reported by China's largest digital technology payment providers WeChat Pay and Alipay.

Preparatory moves for an uncertain landscape

Clearly these technological considerations, regulatory actions, and market dynamics carry major systemic implications for banking and the payments industry. Sheer regulation is highly unlikely to suppress the demand for digital currencies, and innovators will continue to push the envelope by developing new uses and distribution models satisfying both demand and legislative requirements. Similarly, the results of initial pilots and ongoing research of CBDCs will help shape their evolution and potential adoption.

It seems likely that the recent growth in circulation and transaction volume of stablecoins will continue, at least as long as the overall size of the cryptocurrency market continues to expand. Similarly, digital-currency activities by central banks are too widespread for current pilot efforts not to be extended. Will a two-tiered system of CBDCs and stablecoins be sustainable over time? What are the macroeconomic and geopolitical implications of the various scenarios?

Most likely there will be some form of coexistence. Within this continuum we may see flavors

determined by geography (for example, central banks such as China's exerting greater influence through direct control of monetary policy), by market incumbency among private institutions (for example, e-commerce or social media giants in the United States with potential to migrate some user transactions to stablecoins), or by sector (for example, use-based loyalty stablecoins).

Although the market is far too nascent to confidently predict outcomes, constituents from all corners of the payments ecosystem can take valuable steps to position themselves for the inevitable changes on the horizon—regardless of the form such changes take:

- Providers of financial services infrastructure should continually monitor the suitability of their design choices for future interoperability with digital currencies. For example, participation in account-based CBDCs will likely involve direct interaction with a permissioned node, while supporting stablecoins may require wallets with cross-chain access. In particular, it may be important to consider how these choices support high-potential business cases (such as instant disbursements), post-trade investor services, and rapid cross-border remittances.
- Retail banks, merchants, and payment service providers might consider the level of infrastructure investment likely needed for successful implementation of CBDCs and multiple stablecoin networks. Many retail banks already face extensive payments modernization requirements in the coming years—tackling infrastructure for digital currencies represents an additional demand on limited development capacity. Incorporating all such efforts into an integrated road map, reflecting potential synergies and possible triage, should promote long-term efficiency and avoid duplication of effort.
- The impact of CBDCs on private-sector banks likely depends on the speed of their adoption. Specifically, if adoption of CBDCs were to happen relatively quickly, the flow of funds

⁹ Wolfie Zhao, "China publishes first e-CNY whitepaper, confirming smart contract programmability," The Block, July 16, 2021, theblockcrypto.

into bank deposits would be diverted, at least temporarily, into digital cash, thereby limiting the ability of banks to lend and generate fee income with such deposits. Accordingly, it would seem in the interest of private-sector banks for the introduction of CBDCs to be slower and more carefully orchestrated, potentially with initial transaction limits.

- Chief risk and financial officers will benefit from evaluating the broad impact of digital currencies on bank liquidity and capital requirements given potential policy changes. They could monitor potential increases in funding costs, the possibility of further erosion of payments profit margins (for example, given CBDC's potential as a frictionless "free" cash replacement), and even safeguards against potential "digital bank runs"—many of the existing "circuit breakers" that afford some protection for traders and investors currently do not exist in the 24/7 cryptocurrency

markets, although such limits are being built into some CBDC designs.

- The task for government, central banks, and regulators is somewhat more straightforward: to some extent, their decisions will dictate the moves of other parties, although any traction demonstrated by in-market stablecoin solutions will necessarily factor into central bankers' approaches. We expect many will seek to assess the impact of private currencies on the efficacy of monetary policy (for instance, via value flows) and fiscal policy (for example, via government disbursements), tailoring regulatory and supervisory changes accordingly. They will want to balance countervailing factors: extensive regulation could serve essentially to prevent stablecoin use, whereas measured approaches may create a safer environment in which such currencies could flourish.

Learning from China's CBDC pilot

The most advanced market application of CBDC to date has been the People's Bank of China's (PBoC) multicity pilot of its digital version of RMB, called eCNY.¹

From late 2019 the PBoC began to pilot test eCNY in Shenzhen, Suzhou, Xiongan, and Chengdu, initially through app and wallet-based payments. The pilot gradually expanded to Shanghai, Hainan, Xian, Qingdao, and Dalian. As of June 2021, the pilot test included over 20 million personal wallets, more than 3.5 million merchant wallets, and aggregate throughput of more than 34 billion RMB (\$5.2 billion). Initial focus has been on cash replacement for payment scenarios covering transportation, shopping, and government services.

Financial inclusion is a key use case targeted to drive end-user adoption. A bank account will not be a prerequisite for consumer use of eCNY, unless a user desires to replenish a digital wallet. eCNY will carry the same legal status as cash; the PBoC will distribute the digital currency to six authorized state-owned banks, which will circulate it to consumers. Consumers are able to download and deploy a digital wallet from these banks without holding an account with them.

Potential benefits include mitigated KYC risk and reduced compliance cost related to transaction monitoring and reporting, given eCNY's "controlled anonymity" (only central banks will have full access to trading data). Enhanced technical underwriting capabilities are also anticipated, creating competitive differentiation for participating banks. As a social benefit, the digital currency is expected to streamline the distribution of targeted subsidies.

Concurrently, the PBoC has been testing cross-border payments with eCNY in Hong Kong, in a joint effort with the Hong Kong Monetary Authority. Considering the more than \$500 billion of import/export trade between Hong Kong SAR and the Chinese Mainland, the combined impact of cross-border eCNY and eHKD being piloted could meaningfully impact existing financial markets and operators via lower transaction costs, more efficient (real-time) settlement, and support for product innovations such as smart contracts.

Although no timelines for formal launch have been announced, plans are proceeding to feature eCNY capabilities at the 2022 Beijing Winter Olympics.

¹ Formerly Digital Currency Electronic Payment or DC/EP.

- Investors in highly popular and speculative cryptocurrencies—and their issuers—should anticipate the impact of CBDCs on their assets. The emergence of any single central-bank solution and related regulation could deter private-sector innovation and hinder the growth of crypto ecosystems, potentially unsettling investors in an asset class driven so much by sentiment.

Most of all, the co-evolution of stablecoins and CBDCs will directly impact society. While the future is not yet clear, certain behaviors could well signal the direction of this evolution: to what extent will physical cash still be used—and accepted—in society? In what medium of value will employees and bills be paid? Through what means will commerce be conducted, particularly if digital currencies issued on public distributed ledgers lower the cost of hosting accounts and speed payment delivery, and to what extent could a single digital currency

emerge as a global currency? To what extent will citizens resist the full traceability of payments? And to what extent will citizens be comfortable obtaining familiar banking services—such as high-yield deposits, collateralized lending, working capital, and payments services (all available in DeFi today)—without reliance on a traditional bank? And finally, how quickly will we see innovation in blockchain protocols (e.g., proof of stake) that dramatically reduces their environmental impact?

We expect answers to many of these questions to become clearer over the next few years as both stablecoins and CBDCs become more widely available, and the payments industry confronts perhaps the biggest disruption in its history. While the use cases of CBDCs and stablecoins are still emerging, it is not too early to prepare for such disruption.

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