A Brief Overview of Central Bank Digital Currency (CBDC) Developments Around the World

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The COVID-19 pandemic has accelerated the decline in cash payments.[2] Simultaneously, there have been significant developments in digital currency and assets, distributed ledger technology (DLT, blockchain), and stablecoin activities for financial services. These developments present opportunities and challenges for innovation and governance of the digital assets and payment services ecosystems, both in the U.S. and internationally. They can also raise financial stability concerns resulting from spillover effects into financial markets and the real economy.[3]

The most recent White House executive order from March 2022 directs the U.S. Department of the Treasury and other regulatory agencies to study the impacts of cryptocurrency on matters that could affect the stability of the financial system and national security; provide oversight of the cryptocurrency ecosystem including private cryptocurrencies, stablecoins, and cryptoassets; and explore the possibility for the Federal Reserve System to create its own central bank digital currency (CBDC).

To the latter point, the Federal Reserve System issued in January 2022 a white paper for comments on "Money and Payments: The U.S. Dollar in the Age of Digital Transformation." It discusses the current U.S. payments system and its strengths (e.g., recent improvements that help reduce costs and increase convenience and accessibility to many economic agents) and challenges (e.g., the banking and payment services still do not reach a significant number of unbanked and underbanked individuals, new digital payments may bear new risks and shift large amounts of money into unregulated financial providers, and cross-border payments are still slow and expensive).

The paper lays out the key principles and guidance that a potential U.S. CBDC should follow to best serve U.S. needs: 1) ensure consumer privacy protection; 2) operate under an intermediated model, i.e., the private sector would offer digital wallets to facilitate CBDC holdings and payments; 3) be widely transferrable between economic agents and intermediaries, allowing free move throughout the economy; 4) have the ability to identify identities of agents accessing the CBDC to combat money laundering and other related crimes; and 5) provide significant benefits to economic agents and the economy that exceed costs and risks. All of these principles bear important considerations for future policies. As the paper highlights, the CBDC would be digital money denominated in the national unit of account; that is, it would be a direct liability of the

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[2] See https://www.bankofengland.co.uk/quarterly-bulletin/2020/2020-q4/cash-in-the-time-of-covid.

[3] In November 2021, three regulatory agencies — the Federal Reserve, the Federal Deposit Insurance Corporation, and the Office of the Comptroller of the Currency — issued a joint statement on cryptoassets policy concerning banks involvement in business activities with such assets going forward.

central bank, rather than one of a commercial bank. As such, it would carry no credit or liquidity risk, being the safest form of money available to the public. Such a currency would not replace any of the now available forms of money, but only complement them. A CBDC could pose risks and raise concerns related to safety and stability, as well as changes in the financial sector market structure and in the functions that banks perform. Specifically, consumers could reduce deposits supplied to banks, with potential implications for credit supply. A two-sided important issue would involve the privacy of consumers, as a CBDC would need to balance proper privacy to consumers and obtaining enough transparency to prevent criminal activities. The executive order and the white paper explicitly note that the topic is under research and no assumptions are to be made on plans for a CBDC implementation in the U.S.

The need to understand the role that CBDCs may play is also because about 90 other countries are considering the possibility of introducing a CBDC; seven have already launched one including the Bahamas and Nigeria; 17 including China and South Korea are in a pilot phase and prepare to launch one, while others including U.S. are in a research phase.[4] We provide a few international examples below.

The promise of CBDCs is that they could promote financial inclusion and innovation in payments, while improving efficiency, speed, and resiliency, as well as reducing costs, especially in cross-country transactions. For example, by facilitating access to digital payments, a CBDC could also facilitate access to the formal financial system to unbanked individuals. The potential of CBDCs to reduce costs and increase financial inclusion, if realized, may not be as impactful as in developing countries, one reason being the importance of remittances for them.

To this effect, Nigeria was the first African country to introduce a CBDC in 2021, the eNaira, while other countries including Ghana, Morocco, and Kenya are at different stages of research or implementation. As an example, the Central Bank of Kenya recently issued a white paper inviting public feedback on the applicability of a CBDC in the country. In addition to some commonly recognized potential benefits of a CBDC, the Central Bank of Kenya's white paper also highlights significant potential risks: "financial exclusion, technology risks, competing with bank deposits and undermining bank intermediation, hampering monetary policy transmission, anti-money laundering, and combating the financing of terrorism and data privacy balance and infrastructure costs."[5] Thus, CBDC design and implementation considerations could determine potential risks and benefits, like roles and responsibilities of current financial intermediaries and other technical considerations.

The People's Bank of China (PBOC) also announced its plan to launch a CBDC in 2014: the e-CNY. In a recent progress research report issued by the PBOC, the e-CNY was described as the "digital version of fiat currency issued by the PBOC."[6] The report also indicates that the e-CNY will "bolster China's digital economy, enhance financial inclusion, and make the monetary and payment systems more efficient." The paper also delves into other important topics including cross-border payments, monetary sovereignty, the internationalization of currency, the programmability of e-CNY and its relevance for financial innovation. For example, with respect to programmability, the paper highlights the possibility of smart contracts that allow for "self-

[4] See https://cbdctracker.org/.
[5] See https://www.centralbank.go.ke/uploads/discussion_papers/CentralBankDigitalCurrency.pdf.
[6] See http://www.pbc.gov.cn/en/3688110/3688172/4157443/4293696/2021072014364791207.pdf.

executing payments." As for cross-border payments, it indicates that "the PBOC will explore pilot cross-border payment programs and will work with relevant central banks and monetary authorities to set up exchange arrangements (…)". Over the past couple of years, the PBOC has conducted pilot projects in several test cities. The e-CNY was also tested during the recent Winter Olympics, allowing its use within the Olympic Village. A paper by Allen, Gu, and Jagtiani (2022) provides an overview of recent progress on the e-CNY pilot programs.[7]

India also announced the planned launch of its own sovereign digital currency in 2022, the Digital Rupee, by the Reserve Bank of India (RBI) in 2022–2023. Among other benefits of a CBDC for India, the RBI highlights the high currency to GDP ratio in the country and the costs associated with issuing and maintaining physical currency that can be significantly reduced with the introduction of a CBDC.

Many other central banks from other major developed economies are also involved in CDBC projects at different stages of development.

The Bank of Japan introduced its CBDC project in October 2020 and has been conducting proof-of-concept experiments on a CBDC since April 2021. On March 25, 2022, it announced the move to a second phase of this effort that will implement additional functions to its CDBC in a test environment.[8]

In Europe, the European Central Bank (ECB) may issue a digital euro.[9] Highlighted opportunities and concerns with the digital euro follow the same lines as these already described.[10] It was reported that ECB President Christine Lagarde recently expressed her support for accelerating work on the digital euro.[11] The Bank of England also announced its CBDC project initiative and the creation of a new division to lead this exploration in April 2021.[12] The Sweden Riksbank recently completed the second phase of its CDBC project, the e-krona. The focus of this phase was on functionality, performance, and integration of external participants into the e-krona network. The Riksbank is now moving forward with its Phase 3 as a next step toward a possible e-krona future adoption.[13]

Looking at the rapid pace of innovation in the CDBC space, and myriad ongoing CBDC projects around the world, it is not surprising that international coordination and cooperation also play important roles in the CBDC landscape. For example, the Bank for International Settlements (BIS) has partnered with several central banks on a variety of research projects, proofs of concept (POCs), and prototypes focused primarily on fast and efficient cross-country transactions that leverage innovations in distributed ledger technology and digital currencies issued by multiple central banks. The collaborative work sponsored by the BIS highlights the potential of CBDCs for improving efficiency in cross-border payments, while also emphasizing the need for additional

[7] See https://www.sciencedirect.com/science/article/pii/S0261560622000286.
[8] See Commencement of Central Bank Digital Currency Experiments (Proof of Concept Phase 2) (boj.or.jp).
[9] See https://www.ecb.europa.eu/euro/html/digitaleuro-report.en.html?msclkid=0dfdb2dcaba011eca4c8ab96e89cbe0a.
[10] See https://www.ecb.europa.eu/press/key/date/2022/html/ecb.sp220218_1~938e881b13.en.html.
[11] See https://finance.yahoo.com/news/ecb-lagarde-supports-acceleration-digital-164823954.html.
[12] See https://www.bankofengland.co.uk/research/digital-currencies.
[13] See https://www.riksbank.se/en-gb/press-and-published/notices-and-press-releases/notices/2022/e-krona-project-enters-next-phase/.

research in this area.[14] The Federal Reserve System is also collaborating with six other central banks including the UK, Canada, Japan, Sweden, Switzerland, and ECB and B IS on CBDC design features. As a result, in October 2021, a G7 report was published highlighting principles that should govern the development of a CBDC.[15]

Policymakers worldwide are expected to increase their work on CBDCs this year, including research on best design and implementation, investigation of pros and cons for the financial system and economy and learn from experience of countries that already implemented such a currency. In addition, continued focus is expected on new developments in payment systems and decentralized finance (DeFi) more broadly.[16] We look forward to more updates on these important topics later in the year.

[14] https://www.bis.org/about/bisih/topics/cbdc.htm
https://www.bis.org/publ/othp42.htm
[15] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1025235/G7_Public_Policy_Principles_for_Retail_CBDC_FINAL.pdf
[16] https://www.bis.org/press/p220125.htm