kcFED Payments System Research Briefing

Motives Matter: Examining Potential Tension in Central Bank Digital Currency Designs

By Jesse Leigh Maniff

As a new central bank liability, central bank digital currency (CBDC) has the potential to address various issues within current payments and financial systems. The motivation behind a CBDC will determine how it is designed; a CBDC designed to achieve one goal, such as broader financial inclusion, may have difficulty achieving other objectives.

The emergence of private digital currencies has raised questions about the need for a central bank digital currency (CBDC), a "new type of central bank liability that could be held directly by households and businesses without the involvement of a commercial bank intermediary" (Brainard 2019). CBDCs have the potential to address several financial and payments issues, such as improving the efficiency and resiliency of the payments system, but a CBDC designed to improve one outcome may not necessarily improve all of the others (Maniff 2020).

This briefing selects one motivation for a CBDC—financial inclusion—and highlights three ways that a CBDC designed to address this issue may conflict with or impede other objectives for creating a CBDC. Although there is rarely one primary motivation given for a CBDC, both the private sector and central banks cite financial inclusion as a motivation for issuing a digital currency. The World Bank defines financial inclusion broadly as "access to useful and affordable financial products and services" and states that the first step is "access to a transaction account" (2018). In the United States, about 5 percent of households may not have access to a transaction account as they have neither a bank account nor a prepaid card account (Toh and Tran 2020). Thus, a CBDC designed to maximize financial inclusion would ensure that unbanked consumers have the best possible chance to use it—for example, by being able to access the CBDC for both digital and brick-and-mortar transactions. Moreover, to ensure that all households have access to some form of payment mechanism, a CBDC created for financial inclusion purposes would complement, not replace, cash. However, designing a CBDC to maximize financial inclusion may be less effective in achieving other payments goals.

Financial Inclusion and Payments System Improvements

Researchers, policymakers, industry participants, and many others hope that CBDCs will help modernize payment systems through new, more efficient technologies providing additional functionality. Early proponents of CBCDs envisioned an infrastructure similar to that of private digital currencies: a distributed system able to support direct relationships between counterparties, thus removing intermediaries that may make payments time-consuming and expensive. Although distributed ledger technology (DLT) has not proved more efficient for central banks than current systems during experiments, researchers are still optimistic that DLT could increase financial system efficiency once integrated with the broader financial market infrastructure (Chapman and others 2017; Auer and Böhme 2020). Additionally, a CBDC could facilitate programmable money through "smart contracts," code that

self-executes transactions based on some predefined criteria, such as specified conditions, rules, or events (Bank of England 2020).[1] While these new technologies and functionalities may improve messaging, clearing, and settlement processes, a consumer's access to the system at the retail level may look similar to the access point for private digital currencies—a smartphone or the internet.

However, a CBDC designed to be used over a smartphone or internet connection may not be able to maximize financial inclusion without broader digital inclusion—that is, household access to a smartphone or home internet. U.S. unbanked households are significantly more likely to be digitally excluded than banked households (45 percent versus 13 percent), with lack of internet access strongly associated with the probability of being unbanked (Toh and Tran 2020; Hayashi and Minhas 2018). If digital exclusion persists, a CBDC that requires a smartphone or internet connection may only reach about half of the unbanked population, falling short of maximizing financial inclusion.[2]

CBDCs designed for financial inclusion and those designed for payment system improvements may also be at odds over clearing and settlement systems. For example, current proposals call for creating Federal Reserve accounts for retail users by simply expanding access to central bank accounts and having the Federal Reserve scale up its existing transaction processing (Ricks, Crawford, and Menand 2018). These proposed accounts would not rely on new payment infrastructure or processing methods; rather, consumers who do not currently have a bank account would need to open one at a physical location such as the post office (George 2020). Thus, while the proposed accounts may meet financial inclusion goals by providing the general population—especially the unbanked—greater access to central bank money, they are unlikely to meet the goals of improving the payments system. While a CBDC could be designed to accomplish both goals, tension over the importance of clearing and settlement improvements could lead to neither objective being achieved to its fullest.

Financial Inclusion and Cross-Border Payments

Those searching for solutions to cross-border (international) payments frictions hope that a CBDC will provide a public sector solution to the private sector's aim to have cheaper, more efficient cross-border payments. The rationale is similar to a domestic payment system improvement: a CBDC could theoretically provide a peer-to-peer (P2P) payment mechanism that would allow for a direct relationship between a payer and a payee without the need for third party intermediaries. Given that inefficiencies are greater for cross-border payments than for domestic payments, the potential improvements offered by a CBDC may be greater as well.

Cross-border transactions using CBDC often assume a particular payment system for a CBDC to run on. In the example proponents use to describe how a CBDC could facilitate cross-border retail payments, the CBDC is on a DLT platform to enable P2P payments across multiple jurisdictions. If a CBDC designed to promote financial inclusion does not include a new payments infrastructure, cross-border transactions would still be subject to existing clearing and settlement frictions, reducing the potential benefits of a CBDC. Using existing payment systems may further reduce potential benefits if for policy reasons the payer is not permitted to send their CBDC abroad and requires a currency exchange. In a world where a CBDC is designed to maximize cross-border potential, programmability could make this exchange seamless by ensuring that the transfer of "Country A's" CBDC occurs if and only if the transfer

of "Country B's" CBDC also occurs.[3] However, this functionality may not exist for a CBDC that runs on existing payment platforms. Like payments system improvements for domestic payments, the tension over a particular technology could lead to neither financial inclusion nor cross-border usage being fulfilled by a CBDC.

While not an explicit tradeoff, expanding a CBDC to facilitate cross-border transactions also leads to questions regarding the priority of financial inclusion: access. Domestically, "financial inclusion" suggests that anyone who wants to be financially included will have the ability to be financially included. This definition is unlikely to hold internationally for a variety of reasons, from security risks to the potential for liabilities to significantly expand on a central bank balance sheet. Deciding who should be able to access a CBDC will be important for policymakers.

Financial Inclusion and Negative Interest Rates

CBDC has also been discussed as a possible mechanism for setting negative interest rates. Some scholars have highlighted that this motivation "would require explicitly abolishing cash, not just introducing an electronic alternative" (Engert and Fung 2017; Broadbent 2016, p. 7). When nominal interest rates are negative, cash may become an attractive store of value because its interest rate is zero (Bordo and Levin 2017).

However, abolishing cash would be anathema to a CBDC designed for financial inclusion. Although a CBDC may attract many unbanked consumers, there is no guarantee that it would attract all of the unbanked.[4] Thus, designing a CBDC as a cash replacement may actually exclude some unbanked consumers from being able to pay for goods and services. To ensure that the unbanked will have some means of making payments, physical cash would need to continue to exist in some capacity.

Because of this tension over the role of cash, the motivations of financial inclusion and setting negative interest rates may be at odds. Some unbanked consumers may ultimately be further disadvantaged if cash is not an option and technology that supports CBDC is not available to them.

Conclusion

Motivations for issuing a CBDC affect policy and design choices, and a CBDC designed to achieve financial inclusion may conflict with other goals. As policymakers continue to investigate CBDCs, they will have to determine which motivations are actually driving the desire for a CBDC, which may be most beneficial or achievable, and how to tailor the corresponding technology, design, and policy choices to meet those needs.

---

[1] While historically associated with DLT, smart contract functionality may exist on different types of ledgers, broadening the choices of technology.

[2] Research suggests that a CBDC on stored-value cards could allow cash-like, peer-to-peer (P2P) transfers for the unbanked (Shah and others 2020). Although this is true, unbanked consumers already have access to these products, so a CBDC would not provide an additional access point to the financial system.

[3] This particular type of transfer is Payment-versus-Payment (PvP) for cross-currency transactions.

[4] In particular, it remains to be seen whether the unbanked who cited a lack of trust in the banking system (30 percent) and concerns about privacy (28 percent) in the FDIC survey as a reason for being unbanked would adopt a CBDC designed for financial inclusion.

References

Auer, Raphael, and Rainer Böhme. 2020. "The Technology of Retail Central Bank Digital Currency." *BIS Quarterly Review*, March.

Bank of England. 2020. "Central Bank Digital Currency Opportunities, Challenges and Design." Bank of England Discussion Paper, March.

Bordo, Michael D., and Andrew T. Levin. 2017. "Central Bank Digital Currency and the Future of Monetary Policy." National Bureau of Economic Research, working paper no. 23711, August.

Brainard, Lael. 2019. "Digital Currencies, Stablecoins, and the Evolving Payments Landscape." Speech at "The Future of Money in the Digital Age," sponsored by the Peterson Institute for International Economics and Princeton University's Bendheim Center for Finance, Washington, DC, October 16.

Broadbent, Ben. 2016. "Central Banks and Digital Currencies." Speech to the London School of Economics, London, U.K., March 2.

Chapman, James, Rodney Garratt, Scott Hendry, Andrew McCormack, and Wade McMahon. 2017. "Project Jasper: Are Distributed Wholesale Payment Systems Feasible Yet?" Bank of Canada, *Financial System Review*, June.

Engert, Walter, and Ben S. C. Fung. 2017. "Central Bank Digital Currency: Motivations and Implications." Bank of Canada, Staff Discussion Paper no. 2017-16, November.

FDIC (Federal Deposit Insurance Corporation). 2017. "FDIC National Survey of Unbanked and Underbanked Households." Washington, DC: October.

George, Esther. 2020. "Pondering Payments: Challenges of Reaching All Americans." Federal Reserve Bank of Kansas City, *Policy Perspectives*, June 30.

Hayashi, Fumiko, and Sabrina Minhas. 2018. "Who Are the Unbanked? Characteristics Beyond Income." Federal Reserve Bank of Kansas City, *Economic Review*, vol. 103, no. 2, pp. 55–70.

Maniff, Jesse Leigh. 2020. "How Did We Get Here? From Observing Private Currencies to Exploring Central Bank Digital Currency." Federal Reserve Bank of Kansas City, *Payments System Research Briefing*, February.

Maniff, Jesse Leigh, and W. Blake Marsh. 2017. "Banking on Distributed Ledger Technology: Can It Help Banks Address Financial Inclusion?" Federal Reserve Bank of Kansas City, *Economic Review*, vol. 102, no. 3, pp. 53–77.

Ricks, Morgan, John Crawford, and Lev Menand. 2018. "A Public Option for Bank Accounts (or Central Banking for All)." Vanderbilt Law Research Paper 18-33, June.

Shah, Dinesh, Rakesh Arora, Han Du, Sriram Darbha, John Miedema, and Cyrus Minwalla. 2020. "Technology Approach for a CBDC." Bank of Canada, Staff Analytical Note 2020-6, February.

Toh, Ying Lei, and Thao Tran. 2020. "How COVID-19 May Reshape the Digital Payments Landscape." Federal Reserve Bank of Kansas City, *Payments System Research Briefing*, June.

World Bank. 2018. "Financial Inclusion: Overview."

Jesse Leigh Maniff is a payments specialist at the Federal Reserve Bank of Kansas City. The views expressed are those of the author and do not necessarily reflect those of the Federal Reserve Bank of Kansas City or the Federal Reserve System.