The Case for Central Bank Digital Currencies

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New financial technologies—including those underpinning cryptocurrencies such as bitcoin—herald broader access to the financial system, quicker and more easily verifiable settlement of transactions and payments, and lower transaction costs. Domestic and cross-border payment systems are on the threshold of major transformation, with significant gains in speed and lowering of transaction costs on the horizon. The efficiency gains in normal times from having decentralized payment and settlement systems needs to be balanced against their potential technological vulnerabilities and the repercussions of loss of confidence during periods of financial stress.

Multiple payment systems could improve the stability of the overall payments mechanism in the economy and reduce the possibility of counterparty risk associated with the payment hubs themselves. However, multiple systems without official backing could be severely tested in times of crisis of confidence and serve as channels for risk transmission. Decentralized electronic payment systems are also exposed to technological vulnerabilities that could entail significant economic as well as financial damage.

The potentially transformative potential of cryptocurrencies was highlighted by Facebook's 2019 announcement that it plans to issue

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a cryptocurrency called Libra, which would be backed by reserves of fiat currencies. According to Facebook, the goal is to create a more inclusive financial system as well as a more efficient and cheap payments system for both domestic and cross-border transactions. The fully backed nature of Libra suggests that it will provide a stable store of value and will not have any monetary policy implications. The latter proposition, which is the one of more direct concern to central bankers, remains to be seen. After all, it is not obvious what could restrain Facebook from using its massive financial clout to issue a cryptocurrency backed by its own resources rather than by a basket of fiat currencies.

It is an intriguing, and in some ways disturbing, prospect that other large nonbank financial institutions and nonfinancial corporations could also become important players in financial markets, perhaps even issuing their own tokens/currencies. For instance, a company such as Amazon could conceivably issue electronic tokens for trading goods on its platform. The backing of such a large company could ensure the stability of its value and make it a viable medium of exchange, reducing the demand for central bank money for commercial transactions. Such digital tokens issued by Facebook and other well-known nonfinancial corporations could end up being seen as stores of value as well, given the scale, apparent stability, and financial firepower that these corporations command. The major implications of such developments would not just be the reduction in the demand for central bank money as mediums of exchange or stores of value, but the consequences they would have for the business models of banks and other existing financial institutions. Although the potential effects are not obvious and need careful study, these developments could have implications for central banks.

While it is premature to speak of disruption of traditional concepts of central banking, it is worth considering if the looming changes to money, financial markets, and payments systems will have significant repercussions for the operation of central banks and their ability to deliver on key objectives such as low inflation and financial stability. The rapid rise of cryptocurrencies has elicited a range of responses from central banks and governments, from trying to co-opt the changes to their advantage to resisting certain developments for fear of endangering monetary and financial instability. For many central banks, the responses are driven by concerns about the rapidly declining usage of currency and the implications for both financial and

macroeconomic stability if decentralized, privately managed payment systems displace both cash and traditional payment systems managed by regulated financial institutions.

Central Bank Digital Currencies

One response to these technological shifts has been for central banks themselves to innovate in the means for producing money. At a basic level, central bank digital currencies (CBDCs) are simply digital forms of central bank money. The scope of CBDCs encompasses both retail and wholesale payments systems. Wholesale CBDCs entail some efficiency improvements but not fundamental changes to the interbank payments system managed by central banks, since balances held by commercial banks at the central bank (reserves) are already in electronic form. Retail CBDCs, which would be a digital complement to or substitute for physical cash, would be more of a revolutionary change. Retail CBDCs can take one of two forms—either token based or value based. These have very different implications for monetary and other policies.

In the latter incarnation of retail CBDCs, all agents in an economy would have access to central bank accounts, where the balances could in principle be interest bearing. The central bank would in effect become the manager of a sophisticated payments system that would also allow it, depending on the structure of this CBDC, to implement conventional and unconventional monetary policy in nonstandard ways and, in some respects, more effectively.

The motives for issuing retail CBDCs range from broadening financial inclusion to increasing the efficiency and stability of payment systems. For instance, Sweden's Riksbank is actively exploring the issuance of an e-krona, a digital complement to cash, with the objective of "promoting a safe and efficient payment system." CBDCs could function as payment mechanisms that provide stability without necessarily limiting private fintech innovations or displacing privately managed payments systems. Other central banks that have already issued or are considering issuing CBDCs, especially those in developing economies, seem to put higher priority on giving households easier access to electronic payments systems.

One obvious question is whether CBDCs will have an effect on monetary policy or other aspects of macroeconomic policies. Retail CBDCs disseminated through electronic wallets would make it easier

to implement monetary policy more effectively in two ways. First, the nominal zero lower bound, which became a binding constraint for traditional monetary policy in advanced economies during the worst of the global financial crisis, would no longer apply. The central bank could institute a negative nominal interest rate simply by reducing balances on these electronic wallets at a preannounced rate. In an economy with physical cash, this should in principle not be possible since consumers (and firms) have the alternative of holding physical currency banknotes, a zero nominal interest rate instrument. In principle, negative nominal interest rates that would become feasible with certain forms of CBDCs should encourage consumption by making it expensive for households to maintain cash positions.

Monetary policy could also be implemented through "helicopter drops" of money, once seen as just a theoretical possibility of increasing cash holdings in an economy in a nondistortionary fashion by making lump sum transfers to all households. This would be easy to implement if all citizens in an economy had official electronic wallets and the government could transfer central bank money into (or out of) those wallets. Channels for injecting outside money into an economy quickly and efficiently become important in circumstances of weak economic activity or looming crises, when banks might slow down or even terminate the creation of outside money.

Thus, a central bank could substantially reduce deflationary risks by resorting to such measures in order to escape the liquidity trap that results when it runs out of room to use traditional monetary policy tools in a physical cash-based economy.

There is, however, a flip side to the ease with which a central bank can increase or decrease the supply of outside money. The ability to impose a haircut on CBDC holdings, or to increase them rapidly in case the government were to apply pressure on a central bank to monetize its budget deficit, could lead to substitution away from the CBDC. The reduction in nominal balances and the erosion in the real purchasing power of nominal balances through monetary injections would have similar effects—decreasing confidence in the currency as a safe asset that can hold its value, at least in nominal terms.

Analytical Considerations

The academic literature has only recently begun to grapple with the implications of CBDCs for monetary policy. Some authors argue

that a CBDC will not in any material way affect the implementation of monetary policy, although there could be other macroeconomic effects. The conclusions, as indicated by the limited and selective survey below, depend to a great extent on the model structure and the manner in which the CBDC is introduced into the economy.

Barrdear and Kumhof (2016) develop a DSGE (dynamic stochastic general equilibrium) model with multiple sectors and several nominal and real rigidities to understand the effect of introduction of CBDCs. These authors suggest that infusing CBDCs into an economy could result in substantial steady state output gains of nearly 30 percent. This effect persists if the central bank issues a large amount of CBDCs against government bonds.

Bordo and Levin (2019) consider how digital cash could bolster the effectiveness of monetary policy. They lay out some steps for implementing digital cash via public-private partnerships between the central bank and supervised financial institutions. They conclude that digital cash could significantly enhance the stability of the financial system.

Andolfatto (2021) studies the implications of CBDCs in an overlapping generation model with a monopolistic banking sector. In this model, the introduction of interest-bearing CBDCs increases the market deposit rate, leads to an expansion of the deposit base, and reduces bank profits. This is because competition from the CBDC causes banks to raise deposit rates. However, the CBDC has no effect in terms of bank lending activity and lending rates. Although the introduction of the interest-bearing CBDC increases financial inclusion, diminishing the demand for physical cash, it does not disintermediate banks. Fernández-Villaverde et al. (2020) show how, in an economy with CBDC, depositors can internalize the stability of the central bank relative to commercial banks, leading to the central bank becoming a deposit monopolist even in normal times. Agur, Ari, and Dell'Ariccia (2019) model the difference between cash and CBDCs as hinging on two features: anonymity and security.

Mishra and Prasad (2020) develop a simple general equilibrium model that highlights the tradeoffs between physical and electronic forms of fiat currency issued by central banks. The key differences between these two forms of central bank-issued outside money include transaction costs (lower for CBDCs), possibilities for tax evasion (higher for cash, but with a positive probability of being caught

and penalized), and nominal rates of return (zero for cash; potentially positive or negative for CBDCs). They show the conditions under which cash and CBDCs can coexist and also show how different combinations of government policies, such as the level of taxes and the penalty for being caught undertaking tax evasion, can influence the relative holdings of cash and CBDCs. The model provides a framework that can eventually be extended to evaluate conditions under which different forms of government-backed and privately issued currencies can coexist, conditional on the attributes of each of those currencies and also government policies.

While this burgeoning literature has provided some useful insights for designing and evaluating the implications of CBDCs, a great deal of work clearly remains to be done in fleshing out the monetary policy and financial stability implications of CBDCs.

Conclusion

Central banks are now being forced to confront the question of whether to issue digital versions of their fiat currencies. The potential benefits of CBDCs include lower transaction costs, easier monitoring of transactions, and the creation of a backstop to a privately managed payment infrastructure. In addition, well-designed retail CBDCs can also broaden financial inclusion, a particular priority for developing economies, and serve as a backstop to the infrastructure of privately managed payments systems.

However, the issuance of CBDCs will not in any way mask underlying weaknesses in central bank credibility or other issues such as fiscal dominance that affect the value of cash. In other words, digital central bank money is only as strong and credible as the central bank that issues it. In considering a shift to digital forms of retail central bank money, it is important to keep in mind that the transitional risks could be higher in the absence of stable macroeconomic and structural policies, including sound regulatory frameworks that are agile enough to be able to recognize and deal with financial risks created by new types of financial intermediaries.

It should also be recognized, notwithstanding the potential benefits, that there are many unanswered questions about how the new financial technologies could affect the structure of financial institutions and markets. Questions also abound about whether retail CBDCs will in any significant way affect monetary policy implementation

and transmission. These uncertainties suggest a cautious approach to embracing the concept of CBDCs but not shunning it altogether.

One interesting point to note is that small advanced economies—such as Canada, Singapore, and Sweden—along with developing economies such as China seem to be taking the lead in pushing forward with exploration and development of digital versions of their fiat currencies. By contrast, the issuers of the major reserve currencies—the U.S. Federal Reserve, the European Central Bank, and the Bank of Japan—have taken more neutral positions, although some officials even from these institutions have recently begun to espouse interest in the prospect of issuing CBDCs. It would be a game changer if any of the G-3 central banks were to issue their currencies in digital form. Emerging market and developing countries, particularly those that suffer from a high degree of dollarization, might find such developments particularly challenging as they could further erode the demand for money, either physical or digital, issued by national central banks.

In fact, such challenges to domestic fiat currencies might be more imminent than previously thought, now that major multinational social and commercial platforms such as Amazon and Facebook are developing their own digital tokens. Given the easy access that households even in emerging market economies have to these platforms and the enormous financial and commercial clout that such corporations have, cryptocurrencies such as Facebook's Libra could further reduce the domestic demand for fiat currencies, both as mediums of exchange and stores of value. Emerging market central banks and governments may be left with little choice but to proactively develop a strategy that helps harness the benefits of the developments discussed in this article. Every central bank will eventually have to confront the looming challenges from cryptocurrencies, stablecoins such as Libra, and broader fintech developments.

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