

BY JOHN MULLIN

Fed Eyes Central Bank Digital Currency

Policymakers are considering possible design features

Digital assets have been all the rage. Millions of Americans have invested in privately issued cryptocurrencies, whose market value surpassed \$3 trillion for a while late last year. Further pushing the envelope of innovation and speculation, the prices of so-called “algorithmic” cryptocurrencies such as TerraUSD have been supported by yet other cryptocurrencies in arrangements that some observers have likened to Ponzi schemes. Meanwhile, collectors have spent billions of dollars to purchase pieces of art and other items in the form of digital “non-fungible tokens” or NFTs.

Amid this flurry of activity, policymakers around the globe are gauging

possible responses to the fast-changing financial environment. In March, the Biden administration issued an executive order outlining what it called a “whole-of-government approach to addressing the risks and harnessing the potential benefits of digital assets and their underlying technology.” A prominent part of the order was a call to explore the creation of a central bank digital currency, or CBDC.

The United States is far from alone in its interest in a CBDC. Several countries have already launched official CBDCs, more than a dozen others have launched pilot programs, and many more are engaged in research and development projects linked to the

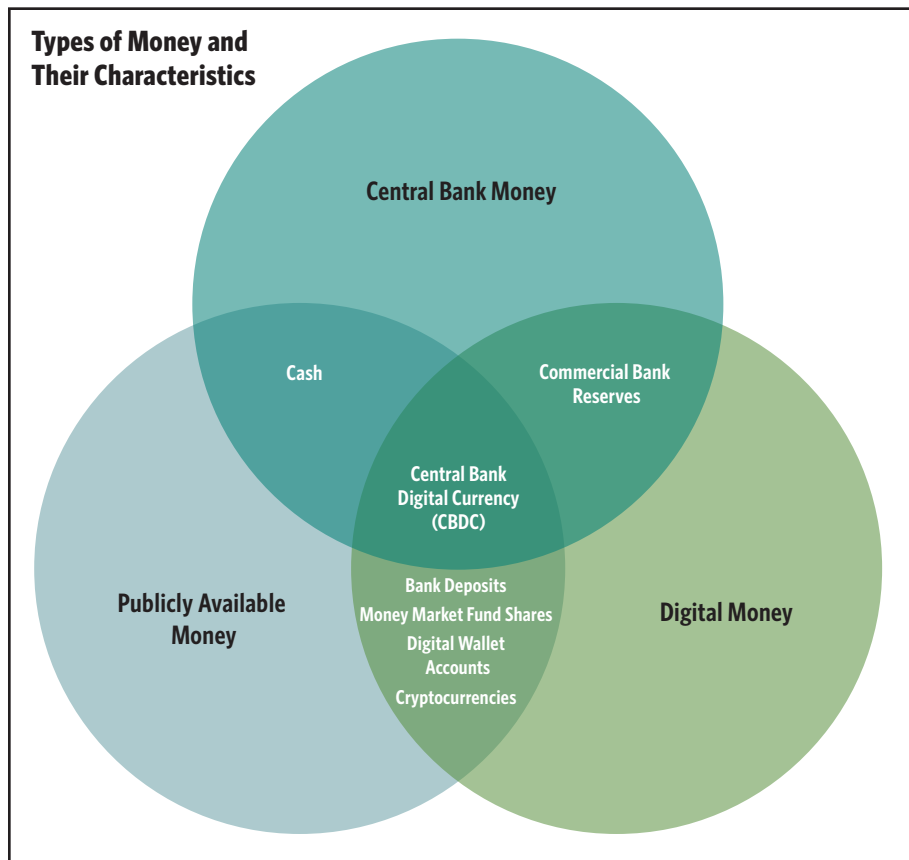
possible creation of CBDCs. In 2020, a group of major central banks, including the Fed, issued a joint report on foundational principles pertaining to CBDCs. And in January of this year, the Fed issued a white paper to stimulate a public discussion about the possible benefits and risks of a U.S. CBDC.

WHAT IS A CENTRAL BANK DIGITAL CURRENCY?

A U.S. CBDC would be a digital liability of the Fed that the public could use as a means of payment. It would constitute a third type of central bank money alongside Federal Reserve Notes — more commonly known as paper currency or cash — and commercial bank reserve balances at the Fed. A CBDC’s digital form would differentiate it from cash, while its availability to the public would differentiate it from commercial bank reserves. (See figure.)

But what is the connection between a CBDC and other digital assets? The answer seems to depend a lot on context. In certain situations, the term “digital assets” has been used quite specifically to refer to cryptocurrencies such as Bitcoin and Ethereum. Yet, viewed from another perspective, the term “digital assets” can be applied much more broadly. After all, money in the United States was booked and transferred digitally long before the advent of cryptocurrencies. Commercial bank reserve balances at the Fed have long been held and transferred in digital form. The same goes for consumer checking accounts at commercial banks. For years now, people have regularly paid their utility and other bills using online applications with funds from their bank accounts.

The volume of digital payments has also expanded greatly through



online payment services, such as digital wallets. Venmo, which is owned by PayPal, processed \$230 billion in payments in 2021, a 44 percent increase over the previous year. Zelle, owned by a consortium of commercial banks, processed \$490 billion in payments in 2021, a 59 percent increase over the previous year.

Cryptocurrencies are distinct from these other forms of digital money in several respects. For one thing, as privately issued media of exchange, their value is based primarily on the forces of supply and demand rather than on a financial institution's promise to pay back a specified quantity of dollars. Moreover, they are differentiated by their technological underpinnings and governance systems. The most prominent cryptocurrencies, Bitcoin and Ethereum, use blockchain technology, which allows for direct, peer-to-peer transactions across a network without the need for a central clearing authority, such as the Fed or a private clearing house.

Stablecoins are a recently introduced form of cryptocurrency whose value is "pegged" to another asset, typically a sovereign currency. As with any pegged asset, the stability of a stablecoin's value depends on the capacity and willingness of the issuer or other parties to maintain the peg by standing ready to buy the stablecoin back at its pegged value. Because of this, policymakers are concerned that stablecoins, like pegged sovereign currencies, may be susceptible to destabilizing runs — that is, consumers might rush to cash in their holdings of a stablecoin if they hear negative rumors about it, possibly overwhelming the ability of its backers to support its value. The run on TerraUSD in May is a case in point.

Arguably, the advent of cryptocurrencies has provided much of the impetus behind the possible creation of a U.S. CBDC. Scholars and policymakers alike are intrigued by the potential of the various technologies associated with cryptocurrencies. But this doesn't mean that an eventual U.S.

CBDC would necessarily look anything like a cryptocurrency. Indeed, a U.S. CBDC might employ little or none of those technologies. Instead, it may end up looking a lot like forms of digital money that long preceded the introduction of cryptocurrencies.

A U.S. CBDC could have a variety of different features, depending on the design choices of policymakers. One possible model is the Bahamian Sand Dollar, which is accessible to archipelago residents through authorized financial institutions. The Central Bank of the Bahamas issues the CBDC, keeps a centralized ledger of individual holdings, and provides authorized financial institutions with a secure application that allows them to offer digital wallets to their customers. Another example is the model being pursued by China, where cash has already been largely replaced among consumers by mobile payment applications like Alipay and WeChat Pay, and where a CBDC would likely compete with these mobile payment services. The digital yuan was launched in pilot form in 2019. Like the Sand Dollar, it is held by consumers in digital wallets and is more similar to payment apps like Venmo or Zelle than to cryptocurrencies like Bitcoin and Ethereum.

CENTRAL BANKS' HOPES . . .

Central banks have identified several possible benefits that might come from the establishment of a CBDC. The first is the prospect that it could lower costs for consumers and improve the efficiency of the payments system — both domestically and for cross-border transactions. This would place the introduction of a CBDC in the tradition of previous Fed initiatives to improve the U.S. payments system, such as the Automated Clearinghouse (ACH) System, a nationwide network used for the direct deposit of payrolls and Social Security checks and automated bill paying. Another example is Fedwire Funds Service, a system for real-time transfers of funds between participating institutions.

A CBDC may also provide opportunities for private sector innovators to create new payment services that consumers can use for CBDC payments. It may also spur competition in the financial industry — among both banks and credit card companies. "Incumbent financial firms have been really resistant to moving to real-time payments and lowering credit card interchange fees," says Howell Jackson of Harvard Law School, who recently taught a course on CBDC design issues. "We really spend more of our national income on payments than we should."

To be sure, some progress has been made. In 2017, for example, The Clearing House, owned by a consortium of commercial banks, introduced its real-time payments platform — known as the RTP — to speed up payment clearing and settlement. The Fed is also in the process of rolling out a new instant payment service, the FedNow Service, to be launched in 2023. But some observers believe more can be done. "A central bank digital currency could jumpstart payments competition," says Jackson, "and that could get us more quickly to high-speed real-time payments, which most people think is a good thing. It could also put a lot of competitive pressure on Visa and Mastercard."

Another potential benefit of a CBDC is that it could encourage financial inclusion for the relatively small fraction of U.S. households — roughly 5 percent — that do not have bank accounts. The hope is that the launch of a CBDC would reduce barriers to financial inclusion by encouraging the private sector to provide greater access to low-cost electronic transaction accounts. A closely related potential benefit is that the establishment of a CBDC could facilitate fiscal transfers, such as IRS stimulus payments, to people who are currently unbanked.

Some analysts have pointed to a possible defensive motive for establishing a CBDC: that it would reduce the risk that the U.S. payments system lags behind technical advances in the

world's other major economies and would thereby help maintain the U.S. dollar's status as an international reserve currency. "An important motivation for considering a CBDC is to future-proof the U.S. payments system against the rise of private and foreign digital currencies," says Richmond Fed economist Zhu Wang, who has conducted extensive research on payments systems. "Private or foreign digital currencies, if not effectively regulated, could raise major concerns on issues such as payment fragmentation, user privacy, market power, monetary policy, and financial stability. Policymakers need to prepare on different fronts by upgrading our country's infrastructure and keeping it on the cutting edge of technology." (See also "Is Dollar Dominance in Doubt?" p. 20.)

... AND FEARS

Central banks have also identified several risks from introducing a CBDC. One is how it could alter the structure of financial markets. Banks now rely heavily on deposits to fund loans. Since a CBDC would serve as a close substitute for bank deposits, its introduction could cause consumers to withdraw funds from their bank accounts. This, in turn, could increase bank funding costs and adversely affect the availability and cost of bank credit for households and businesses.

Policymakers are also concerned about the possible volatility of demand for a CBDC. In this context, one of the suggested benefits of a CBDC — its lack of both credit and liquidity risk — could turn out to be a double-edged sword. During periods of financial turmoil, the relative safety of a CBDC may prompt risk-averse individuals and businesses to substantially shift away from other forms of money, increasing the risk of runs on financial firms such as money market mutual funds and commercial banks. While deposit insurance would soften the motivation of bank depositors to pull their money in reaction to bad news, there is concern that it may prove insufficient

to prevent large shifts from traditional bank accounts into CBDC accounts during periods of extreme duress.

Such a flight to quality would make the Fed's job more difficult. Banks would be forced to scramble for alternative funding sources, and the Fed would feel pressure to provide liquidity to institutions in order to fulfill its financial stability mandate and prevent an upward spike in short-term interest rates.

"I think what's often overlooked in these discussions is that the demand for CBDC could potentially expand extraordinarily rapidly during periods of distress," says Bill Nelson of the Bank Policy Institute, which conducts research and advocates on behalf of the banking industry. "If the Fed were to offset the decline in bank reserves, the Fed's balance sheet could climb tremendously."

Aside from these concerns related to financial market structure and monetary policy, policymakers are also concerned about how the creation of a CBDC would affect the resilience and cybersecurity of the payments system in light of the possibility of hacking. In addition, some observers are wary that a CBDC, if not properly designed, could create new avenues for illegal activities, such as money laundering and terrorist finance.

CBDC DESIGN POSSIBILITIES

The design of a CBDC can vary greatly depending on the objectives of policymakers. One of the first design questions often raised is whether a CBDC should be account-based or token-based. A key distinction between the two systems is their identification requirements. For a traditional bank account, intermediaries establish ownership by verifying the owner's identity. For many token-like instruments, such as Federal Reserve Notes and cryptocurrencies, ownership is established by possession — the thing that needs to be verified is not the owner's identity but rather the instrument's authenticity.

The two systems can differ greatly in how they treat fraudulent and erroneous transactions. In account-based systems, providers of traditional bank and credit card accounts typically reimburse account holders after establishing that third parties have fraudulently made payments. In token-based systems, on the other hand, there is little recourse for people who have their money lost or stolen. Nor is there reliable recourse for the recipients of counterfeit crypto tokens. Much like the recipients of fake \$20 bills, they may simply be out of luck.

A second, closely interrelated question is ledger design. Payments with a CBDC are, by definition, transfers of a central bank liability — transfers that must be recorded on some sort of ledger system. The ledger could be managed in a centralized manner, with a single trusted party responsible for record keeping. Alternatively, the ledger could be managed in a decentralized manner on a network of separately owned computers, with collective or "distributed" record keeping, in the manner of Bitcoin. Hybrid approaches are also possible.

A third major design issue has to do with distribution and administration. The main question here is whether a CBDC should be offered directly to the public by the central bank or through financial intermediaries, who would likely administer CBDC accounts much like trust funds on behalf of their owners.

Researchers have been hard at work exploring the technical issues raised by a CBDC. One of these efforts is Project Hamilton, an MIT/Boston Fed collaboration. Their recent Phase 1 report suggests that simple dichotomies such as *token-based vs. account-based* and *centralized vs. decentralized* are only a starting point for understanding the design issues. In their view, these categorizations aren't enough to encompass "the complexity of choices in access, intermediation, institutional roles, and data retention in CBDC design." It cited the example of a digital wallet, which

“can support both an account-balance view and a coin-specific view for the user regardless of how funds are stored in the database.” In a similar vein, a central bank can maintain a centralized ledger while delegating much of the system’s customer-facing work to private sector intermediaries, such as banks.

THE FED’S WHITE PAPER

The Fed’s January white paper reveals much about the Fed’s views on design trade-offs. For one thing, the Fed does not view a U.S. CBDC as a replacement for cash, essentially agreeing with other major central banks that “a CBDC would need to coexist with and complement existing forms of money.”

The Fed expressed reluctance to get into retail banking (a move that might require congressional authorization). Instead, the white paper favored an intermediated approach that would work through private financial institutions to take advantage of their existing systems for complying with anti-money laundering laws and Know Your Client laws.

With regard to privacy, the Fed said it wants to “strike an appropriate balance ... between safeguarding the privacy rights of consumers and affording the transparency necessary to deter criminal activity.” The Fed’s concerns about money laundering and terrorist finance preclude a CBDC that has Bitcoin-like anonymity. Still, the Fed stated, “Protecting consumer privacy is critical.”

“The Fed is proposing a framework in which the government does not have too much direct access to personal account information but does have the capacity to get it through legal process,” says Howell. “So, the government will be able to get information

the same way they now get information from private institutions — either through AML [anti-money laundering] reporting or legal process. I think they’re trying to keep that as a sensible division — something that people in the United States are comfortable with.”

A SOLUTION IN SEARCH OF A PROBLEM?

Fed Gov. Christopher Waller concluded an August 2021 speech with the observation, “I am left with the conclusion that a CBDC remains a solution in search of a problem.” He is not alone in this sentiment, as many observers have registered skepticism that a CBDC is either necessary or sufficient to achieve the two major goals that its advocates have set for it: improving payments systems and increasing financial inclusivity.

Some say a CBDC intermediated through private financial institutions, as suggested by the Federal Reserve Board’s white paper, may not offer much in the way of innovation — that it may merely overlap with current retail offerings, including traditional banking accounts and newer real-time payment services, such as Zelle. They look to other ways of improving payments.

“I think for almost all — if not all — of the policy objectives that have been advanced for a CBDC, there are less risky, more efficient alternatives to achieve those objectives,” says Rob Hunter of The Clearing House. “For faster payments, those alternatives are the already functioning RTP network and the soon-to-be available FedNow network.”

It is uncertain whether a CBDC would lower the costs associated

with cross-border payments. “With cross-border payments, the biggest cost overlay is really in the compliance area,” says Hunter. “You’re talking about payments in jurisdictions that have different AML and terrorist financing frameworks. And that’s really where the cost drivers are coming in. And unless a CBDC is going to ignore all those frameworks, it’s not really going to solve for that.”

Finally, there would be obstacles to overcome for a CBDC to increase access for the underbanked. Nelson argues that someone who does not already have a standard bank checking account would not be more likely to open a CBDC account without some further inducement. “When you ask people why they are underbanked, the reasons they list are not having enough money to open an account or being distrustful of financial institutions,” says Nelson. “These are things that don’t really seem to be fixed by a CBDC. You’d have to provide subsidies to attract people who don’t already have bank accounts, and that would be quite costly.”

BE PREPARED

Even if it is controversial whether some problems can be fixed by the introduction of a CBDC, many observers think there still are compelling reasons to conduct research into them — and about digital assets and platforms more generally. “We don’t exactly know how things are going to evolve in the digital money and payments space,” says Wang. “It will take great efforts to get the right regulations in place and it will take time to get the CBDC technology ready, and it will be good to prepare on both fronts.” **EF**

READINGS

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“On the Road to a U.S. Central Bank Digital Currency — Challenges and Opportunities.” The Clearing House, July 2021.

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