Let’s Get Digital: A Briefing on Central Bank Digital Currencies

Executive Summary

- An increasing amount of central banks are in the process of studying central bank digital currencies (CBDC), broadly defined as digital forms of existing central bank money. Most central banks are still in the very early stages of examining CBDCs, and even those that are further along in studying the topic still appear to be several years away from issuing this new type of digital money.
- For the most part, the technology underlying CBDCs does not appear to be revolutionary—instead, more radical are the possible implications for monetary policy and the broader financial system. Concerns around these potential implications may lead central banks to approach CBDCs cautiously. Overall, however, CBDCs are not in our view a significant threat to the U.S. dollar’s reserve status or the existing fiat currency system, at least for now.

A New Form of Money

Central bank digital currencies (CBDC) have recently gained some modest attention (Figure 1) as central banks globally have begun exploring the pros and cons of creating and implementing their own digital currency systems. There is no single widely accepted definition for CBDCs, but the term is generally used to describe a digital instrument that is similar in nature to existing forms of central bank money. In this report, we focus on general purpose CBDCs, or CBDCs for use by the public, in contrast to wholesale-only CBDCs, designed for settling certain derivative and other securities transactions more efficiently.

Conceptually, general purpose CBDCs can be thought of at a high level as simply a digital form of existing cash issued by central banks. In practice, the technology underlying a CBDC system can be as simple as debit cards and mobile phone apps. Thus, for most forms of CBDCs, the underlying technology and even the general concept are not necessarily novel, but as we discuss later, the application of the technology is largely untested and could have significant implications.
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There are two main types of general purpose CBDCs: token, or value-based, and account-based.1 A value or token-based CBDC would closely resemble cash, in the sense that transactions would be anonymous and could be conducted on a peer-to-peer basis. However, the “token” in this case is digital rather than the physical currency, such as cash, used in most existing systems. Transactions in a value or token-based CBDC system could be done with a payment card or mobile phone app and would likely be facilitated by a third-party payment provider. Notably, a value or token-based CBDC could use distributed ledger technology (e.g., blockchain) to verify and record transactions, although this is not necessarily needed. Finally, a value or token-based CBDC, as well as an account-based CBDC, could be interest-bearing, depending on the objectives of the issuing central bank.

Separately, an account-based CBDC would involve an individual having an account at the central bank directly, in contrast to the current system in which individuals largely have accounts with commercial banks, which themselves have direct reserve accounts at the central bank. In an account-based CBDC system, individuals might access their accounts via a payment card or mobile phone app, in much the same manner as value/token-based CBDCs. However, transactions conducted using an account-based CBDC are unlikely to be anonymous, as the central bank would be the source of verification for transactions and would thus have broad access to customer information and transaction history. Moreover, an account-based CBDC likely could not be transferred on a peer-to-peer basis, unlike physical cash and value/token-based CBDCs. In that sense, the account-based CBDC is conceptually very much akin to a debit card, with the main difference being that the individual’s account would be held at the central bank directly rather than at a commercial bank.

Considerations: Why Issue CBDCs?

Now that we have described in some detail the likely and potential features of CBDC, we turn to another question of interest: why would a central bank want to issue its own digital currency? For some central banks, the decision to issue CBDCs may become one of necessity to maintain a safe, smooth and efficient payments system. Take Sweden for example, where the central bank (the Riksbank) is running a pilot project to develop a CBDC known as the “e-krona,” a response to the rapid decline of cash use in Sweden. According to a 2018 Riksbank survey, only 13% of individuals said that they paid for their most recent purchase using cash, down from 39% in 2010.2 The Riksbank’s e-krona project is thus far only being tested in a limited and controlled environment, and actual issuance and implementation may be years away. Still, the decline in cash use in Sweden seems to have prodded the Riksbank to work toward designing an alternative, central-bank controlled payment system for the general public.

Another somewhat obvious reason to issue CBDC is that it represents an improvement in efficiency and seamlessness relative to physical cash. Moreover, in emerging countries in particular, CBDC may make the financial system more inclusive, namely by offering access to digital payments at little to no cost to individuals that otherwise lack sufficient access to banks and existing secure payment mechanisms. The latter consideration appeared to be a motivating factor for Uruguay’s central bank to launch a CBDC pilot project just over a year ago, known as the “e-peso.” The e-peso project ran for six months and was largely deemed to be a success, but the central bank is still in the process of deciding whether to issue the e-peso on a wider and more permanent basis.3

The fact remains, however, that the vast majority of major central banks are in the very early stages of studying CBDCs, or are not studying them at all. Moreover, even the central banks that have conducted pilot projects have not announced actual plans to formally issue CBDCs for widespread public use. In some cases, central banks do not even have the legal

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1 BIS Committee on Payments and Market Infrastructures and Markets Committee (2018): Central bank digital currencies, March.
mandate to issue CBDCs, while others may be more concerned with other issues, such as infrastructure and digital security risks. For many, there is simply a general lack of urgency to develop a CBDC—most developed and large emerging economies have not experienced the decline in cash use that Sweden has, and financial inclusion may not be as prevalent an issue in these economies (Figure 2). That said, even for those central banks for which there is urgency, or at least interest, in issuing CBDCs, the implications for monetary policy and financial stability could be significant and may help explain policymakers’ cautious approach.

**Figure 2**

<table>
<thead>
<tr>
<th></th>
<th>Cash in Circulation</th>
<th>Percent of GDP</th>
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<tbody>
<tr>
<td>U.S.</td>
<td>10%</td>
<td>0%</td>
</tr>
<tr>
<td>Euro*</td>
<td>15%</td>
<td>5%</td>
</tr>
<tr>
<td>Swiss</td>
<td>20%</td>
<td>10%</td>
</tr>
<tr>
<td>Japan</td>
<td>25%</td>
<td>15%</td>
</tr>
<tr>
<td>Sweden</td>
<td>0%</td>
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* Euro figures represent 2002 and 2016 rather than 2000

Source: Bank for International Settlements and Wells Fargo Securities

**Implications for Monetary Policy**

While CBDCs may be relatively unremarkable as a technological innovation, as a policy innovation they are more interesting, and could have far-reaching implications. Let us start by looking at what CBDCs could mean for monetary policy. One of the more potentially positive implications of CBDCs is that they could help improve the monetary policy transmission mechanism, specifically through customer deposit interest rates. In practice, customer deposit rates may be relatively low on the list of interest rates that a central bank is concerned about influencing, but in theory, more direct control over customer deposit rates could mean that central bank policy decisions could be more effective in influencing real economic activity. An interest-bearing CBDC would offer central banks just such an opportunity—by raising policy rates, and in turn raising interest rates on CBDC, a central bank would make saving more attractive versus consumption, likely curbing spending activity (and vice versa if it lowered rates). By allowing the central bank to more directly influence consumer deposit rates, an interest-bearing CBDC could strengthen the pass-through of monetary policy changes to consumers’ savings and consumption decisions. In addition, to the extent commercial bank deposit and lending rates become more sensitive to central bank rates in a world of interest-bearing CBDC, the policy transmission mechanism could improve even further.

On a similar note, an interest-bearing CBDC could ease the constraint of the zero lower bound on monetary policy, through two key channels. Among the concerns policymakers have regarding negative interest rates are that banks may not pass those negative interest rates on to consumers, effectively weakening the policy transmission mechanism. As we already discussed, interest-bearing CBDCs could address that concern by administering the policy rate directly to consumer deposits. Of course, economic theory might suggest that at some point, negative interest rates become so punitive that consumers and businesses prefer to simply hold cash instead of depositing money at the central bank. However, in a theoretical world without cash and with interest-bearing CBDCs, the public may have little choice but to hold money with the central bank and accept the policy rate being administered, no matter how negative it is.
In that theoretical system, the effective lower bound on interest rates would likely be substantially lower than it currently is, which would only further bolster the pass-through of monetary policy to various interest rates in an economy. However, in practice, CBDCs and cash are likely to co-exist, at least at first, which may reduce the extent of any potential decline in the effective lower bound. Still, as a seemingly increasing number of central banks face the constraint of the effective lower bound, CBDCs may thus become an ever more attractive tool to cope with this constraint.

There are some reasons to be cautious on CBDCs, however, particularly from a financial stability perspective. For example, it is possible that the public could show a strong preference for CBDCs versus cash and/or traditional bank deposits if they prove to be more efficient and/or convenient. In addition to the possible implications for the central bank’s balance sheet, both in terms of its size and composition, a shift in the allocation of consumer deposits away from commercial banks could also have implications for financial stability. In particular, the quantity and stability of commercial bank funding could be more at risk if consumers show a strong preference for CBDCs, and there could arguably be increased potential for bank runs in this scenario. Indeed, under financial stress, CBDCs could be viewed as a safer alternative to traditional bank deposits given central banks’ ability to print currency, and thus may be more desirable than those traditional deposits. Emerging economies may be more exposed to this issue, especially those economies in which deposit insurance is more limited. As a means of addressing this potential demand problem, central banks could cap the amount of CBDCs available to individuals, or introduce a “tiered” interest rate on CBDCs to discourage excessively large holdings and prevent a full substitution away from traditional bank deposits.

**How Innovative and Disruptive Could CBDCs Be?**

As we wrap up, we see value in taking a step back and contemplating the potential disruption of CBDCs, both from a timing perspective (i.e., how fast will they be implemented) and in terms of magnitude (i.e., how significant of a change they will be from the current system). From a timing perspective, as we mentioned earlier, the vast majority of central banks do not appear to be anywhere close to issuing CBDCs, and even those central banks that are most advanced (e.g., Sweden, Uruguay) do not seem to have an explicit timeline for actually issuing CBDCs after initial pilot programs. Thus, for the foreseeable future, CBDCs are likely to remain relegated to research papers rather than the hands of the general public.

When we think about the potential magnitude of change from the issuance and widespread use of CBDCs by the general public, we reiterate the point that the technology underlying CBDCs may not be especially revolutionary (for instance, the debit card model in an account-based CBDC system). That said, there is potential for a more advanced token-based CBDC using distributed ledger technology, which would certainly represent more of a departure from the current orthodoxy of consumer payments. Still, the more revolutionary aspect of CBDCs in our view is the potential for a shift in the central bank’s role in the economy, particularly as it relates to their relationships with commercial banks, as well as the broader implications for monetary policy and financial stability outlined in this report. We would expect these issues to remain near the top of the list of concerns among central bankers as discussions and research on CBDCs continue in the years ahead.

As a final note, we do not at this time view CBDCs as a threat to the U.S. dollar’s status as the world’s preeminent reserve currency, or a threat to the dominance of fiat currencies more broadly. Indeed, if another major central bank, such as the ECB or BoE, issued a CBDC and the Fed did not, we doubt the technological advancement alone would suddenly propel the euro or pound to be more of a threat to the de-throne the U.S. dollar. Instead, domestic governance, financial market structure, economic size and other factors are likely far more important in determining a currency’s reserve status. Meanwhile, most forms of general purpose CBDCs would by definition be fiat currency, only in digital form, and thus if anything they would represent an evolution in the fiat currency system as opposed to a threat to it. Thus, we think the near-term focus around CBDCs will remain primarily centered around the implications for monetary policy and financial stability.
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