

On the Necessity and Desirability of a CBDC

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October 2021

Central Bank Digital Currency

The movement behind central bank digital currency (CBDC) is gaining momentum. I confess to playing a small role in promoting the idea; see, for example, Andolfatto (2021a,b). In this essay, I take a step back from this work and critically re-examine the arguments I and others have made to support the CBDC initiative. I also assess some of the arguments made against CBDC. I conclude that both sides are likely overstating their respective cases. When I weigh all factors together, I conclude that—for the United States, at least—a retail CBDC is not essential and may not even be desirable. A wholesale CBDC, on the other hand, is a variation on the theme that is worth considering. This latter recommendation is nothing new—it corresponds the old idea of enacting legislation that would permit free-entry into the business of narrow-banking.

Let me begin by asking what makes CBDC a compelling idea. I like to think of it this way. Imagine having to design a payments system from scratch. At its core, clearing and settling payments boils down to messaging and bookkeeping. The act of debiting and crediting money accounts in a ledger does not sound like rocket science—it sounds more like Accounting 101. If we think about all the payments that are made everyday between customers and merchants, merchants and suppliers, employers and employees, private and public agencies, and so on, what could be simpler than having all this bookkeeping performed on a single ledger operated by a single accounts manager? And since we are talking about *money* accounts, why not have these accounts consist of the nation’s legal tender—digital versions of today’s paper bills and metal coins? And if we are talking about legal tender money accounts, why not appoint the central bank as the trusted accounts manager? This is the main idea behind a CBDC. It is a proposal to let all Americans open checking accounts consisting of digital fiat currency with the Federal Reserve. At present, this privilege is limited to depository institutions and a few other agencies.

The U.S. Payments System Today

A CBDC seems like an elegant solution for the problem of managing

payments relative to the system presently in place. The payments system today consists of three broad layers. On the top layer, we have the U.S. Federal Reserve, the nation’s central bank. The second layer consists of private banks, specifically, depository institutions. While the number of banks has been falling over time, there are still almost five thousand banks in the United States today, with the top ten banks holding about half of all deposits. Almost all (95%) American households have bank accounts in this second layer.

Note that the money in bank accounts is not fiat currency—it consists of liabilities issued by private banks. If a bank fails and if its deposit liabilities are not insured, the depositor may incur a loss. These private banks, in turn, have accounts with the Federal Reserve. The bank accounts held with the Federal Reserve are not subject to default. Traditionally, private banks have been responsible for processing retail payments. Transactions occurring between two parties not sharing the same bank are cleared through a variety of payment systems, with net interbank surplus/deficit positions ultimately settled at the central bank.

The third layer consists of several non-bank payment service providers (PSPs), like *Mastercard*, *PayPal* and very soon, Facebook-sponsored *Diem*, as well as a rapidly growing number of fintechs eager to enter the business. Because this third layer is presently prohibited from having reserve accounts, firms in this category cannot use the Federal Reserve’s wholesale payment rails. As a practical matter, this implies that non-bank PSPs must either partner with a bank or otherwise go through the private banks to conduct at least a part their business. This additional layer of intermediation has been called into question by many observers. It is a layer that could be eliminated if a wholesale CBDC were to be made available.

The Case For CBDC

CBDC advocates point to several benefits. First, because CBDC is fiat currency, CBDC accounts are fully-insured.¹ Second, the problem of communicating across databases speaking different languages for the purpose of clearing and settling payments is entirely circumvented; at least, to the extent

¹While fiat money is labeled a liability of the government, it is not “debt” the way money represents a contractual obligation under a gold standard or fixed exchange rate regime. For a monetary sovereign—like the United States—fiat money resembles equity more than it does debt. While dilution is a possibility, default is not.

that all households and businesses choose to open and use CBDC accounts. A CBDC would combine a common currency with a common language—for example, the ISO 20022 global payment messaging standard—together with real-time payments functionality. Third, a CBDC could be designed in a manner that directly addresses the concerns people and businesses have over data privacy and ownership. Fourth, the enterprise could be operated and funded in the manner of basic public infrastructure. The purpose of this would be to promote financial inclusion or otherwise level the playing field between large and small actors, say, by eliminating all user fees and minimum balance restrictions (Crawford, Menand and Ricks, 2021). It would also promote competition and encourage innovation as fintech firms would no longer need banks to serve as their correspondents (Usher, Reshidi, Rivadeneyra and Hendry, 2021). There are other purported benefits associated with a CBDC unrelated to payments, but I will touch on those arguments in a later section.

But is a CBDC Necessary?

Granted, the U.S. payments system is not perfect. Even if we grant that the system has generally improved over time, there is little question that it has lagged its counterparts in several other jurisdictions, including a number of so-called lesser-developed economies. Whether a CBDC is the best, or even only, way to optimize payments going forward, however, should not be assumed *a priori*. And, indeed, a number of commentators have made exactly this point; see Koning (2021), Quarles (2021), and Waller (2021). Much of what I have to say in this section draws on their observations.

Let me go down the list of the purported benefits of a CBDC and reflect on each point. First, it is true that CBDC accounts would be fully-insured. But is the lack of deposit insurance a concern for most retail users? The Federal Deposit Insurance Corporation presently insures bank deposits up to \$250,000 per account. It seems unlikely that households and small businesses would be attracted to CBDC on the basis of relatively safety. Money held in non-bank PSP accounts is not insured. The fact that people willingly hold transaction balances in such accounts further diminishes the suggestion that safety is a major concern. Whether the same holds true at the wholesale level, however, is not entirely clear. CBDC would provide universal access to a central bank deposit facility (rendering the Fed's ON RRP facility redundant). The availability of an interest-bearing CBDC might encourage

corporate cash managers to substitute away from repo arrangements into CBDC, avoiding the counterparty risk associated with the shadow bank sector. Or, as the analysis in Andolfatto (2021a) suggests, the effect may simply be to place a floor on money market rates without disintermediating private credit arrangements. If this latter outcome is, as I conjecture, the more likely one—then the relative safety of CBDC may not be a primary concern even at the wholesale level.

Second, it is true that processing payments would be made considerably easier if everyone had a CBDC account—in particular, it would avoid the need to communicate across databases when clearing and settling payments. On the other hand, this would also be true if everyone had a Bank of America account. But these are (and are likely to remain) hypothetical scenarios. In reality, American households and businesses hold bank and non-bank accounts with thousands of firms. This is not going to change anytime soon. While it is true that clearing and settling small-value payments across all these databases takes some time (typically, 2-3 business days), there are presently efforts underway to improve efficiency along this dimension. The automated clearinghouse (ACH) network now enables same-day settlement of ACH payments. The *Clearing House* has recently developed a real-time payments service that provides the owners of bank accounts immediate access to their funds. A similar technology called *FedNow* is being developed by the Federal Reserve. The case for a CBDC should not be made on the assumption that the *status quo* is expected to persist. Rather it needs to be made in the context of an already rapidly developing payments system. In light of what is, or what will soon be available to most Americans through the initiatives described above, the case for a CBDC seems considerably weakened.

Third, a CBDC could adopt protocols that allocate property rights over individual transaction histories to the individuals generating those histories, as opposed to the intermediaries that record this information. Individuals would then be free to use their data to shop around to, for example, secure better terms on credit arrangements. But again, a CBDC is not the only way to achieve this outcome. The result could instead be achieved through appropriate legislation, as it is in the United Kingdom through its Open Banking initiative. That legislation forces U.K. banks to create open interfaces into previously locked customer accounts and payment systems.

Fourth, while the idea of basic payment services as a free public option

sounds attractive, it is not immediately clear how such a facility would promote the cause of financial inclusion (which I take here to mean access to payment services, not credit). Most American households already have bank accounts. Many also have non-bank transaction accounts. The fraction of unbanked households in all other developed economies appears to be much lower than in the U.S., even though CBDC does not (yet) exist in those jurisdictions. As for the charges and restrictions that are often applied to checking accounts, banks are increasingly making free checking services available for their customers. Credit card companies often offer cards with zero fees, as long as borrowed money is repaid at the end of each month. From the consumer side of things, at least, the user cost of payment services already seems low; at least, for domestic payments. The costs of international remittances remains relatively high, but these too have been declining over time, especially through mobile payment options.² It is conceivable that a CBDC could complement the effort to reduce the costs of international money transfers. But as the Bank of International Settlements notes (BIS Annual Report, 2021 III), the effort would require international cooperation. One cannot help but wonder whether CBDCs would be needed if that cooperation was forthcoming to begin with.

Although the user cost associated with making payments is either low or declining for consumers, the same is not necessarily true for businesses. Credit card issuers (usually credit card companies) and acquirers (usually banks) recover the cost of their operations—and possibly more if they can exert market power—by charging fees to the merchants that agree to accept card payments. The contractual terms often include an “honor all cards” rule that restricts the merchant from conditioning product prices on method of payment. While larger firms are often able to negotiate more favorable terms, smaller businesses have little bargaining power. They must either accept the terms or risk losing sales. This pricing protocol is complemented by the strategy of *paying* customers to use their cards, typically through a rewards or cash-back program. To put it another way, card customer user costs are not only low, they are, in many cases, *negative*. The effect these practices is to encourage consumers to select the payment option with the highest private reward—not necessarily the one with the lowest social cost. Higher costs must, of course, be absorbed along other dimensions, including—

²See <https://www.statista.com/statistics/962701/costs-of-remittances-by-payment-type/>

but not limited to—higher overall product prices.

Given the business model described above, how might an even zero user-cost CBDC attract users? Cardholders already have access to several low-cost payment options. A CBDC may potentially offer consumers a relatively high interest rate on their deposits, but this is a reward for saving. Card companies reward consumers for spending. While merchants would no doubt be happy if consumers were to switch *en masse* to a CBDC, there would be no point in introducing the product—at least for this purpose—if consumers are not willing to part with their beloved reward programs. If the success of a CBDC depends on regulating interchange fees and rewards programs, then what is necessary is regulatory reform and not CBDC *per se*.

Other Costs and Benefits

CBDCs are also promoted and criticized for reasons not directly related to payments.

First, there are worries about what might happen if physical cash eventually disappears. One concern is that monetary policy may no longer be able to determine the price-level in a “cashless” economy. Physical currency, however, is better viewed as just one component of a broader monetary aggregate. It seems unlikely that the price-level depends critically on the fraction of money balances people choose to hold in currency *vis-à-vis* other forms of money (Andolfatto, 2021a). Another concern is that zero-interest currency places an effective lower-bound on bank deposit rates. Absent this lower bound, banks may exert their monopoly power to drive deposit rates to even lower levels (Usher, Reshidi, Rivadeneyra and Hendry, 2021). However, it seems doubtful to me that currency is needed to avoid negative deposit rates. In the United States, all U.S. persons can open online accounts with the U.S. Treasury via *Treasury Direct*. If the yield on Treasury bills goes negative, it will be because of monetary policy and not because of monopoly banking practices. In any case, the prospect of cash disappearing seems less likely for the United States relative to other countries. If anything, the global demand for U.S. physical currency has been growing rapidly.

Second, CBDC is sometimes promoted as a way to *encourage* the disappearance of physical currency. The concern here once again has to do with the zero-lower-bound. But in this case, the lower-bound is seen as an impediment to monetary stabilization policy—specifically, situations in which negative nominal interest rates are needed to stimulate aggregate demand. I

am skeptical of this argument for two reasons. First, a situation that calls for negative interest rates is, in my view, better dealt with through fiscal policy. Second, negative interest rate policy is already being applied in many countries where physical currency still exists. CBDC is not needed to implement negative interest rate policy.

Third, there is a concern that CBDC would disintermediate banks (although this is considered to be a feature and not a bug by some proponents). It seems likely that a CBDC that offers an interest rate higher than prevailing deposit rates would increase the cost of funding for banks. It is not *a priori* clear, however, how these higher costs might impact bank lending. Much will depend on monetary policy and market structure. Bank lending is not likely to be much affected if the interest rate on CBDC is kept below the monetary policy rate (Andolfatto, 2021a). To the extent that banks have market power, they are likely to see their profit margins squeezed as they raise deposit rates to retain what is still a relatively cheap source of funding. But higher deposit rates may even expand the supply of deposits. Theoretically, it is possible for this latter effect to *increase* bank-financed investment (Chiu, Davoodalhosseini, Jiang and Zhu, 2019).

Fourth, some have suggested that a universally-available central bank deposit facility is likely to promote financial instability because it would provide an extremely convenient “flight-to-safety” vehicle—even more so than physical cash (which pays no interest and has a maximum denomination of \$100 in the United States). This argument fails to take into account at least three important considerations. First, if a run on banks occurred for this reason, the Federal Reserve would stand ready to lend at the discount window and standing repo facility. Second, the CBDC rate itself could be made state-contingent. In particular, it could be lowered significantly during a run event, thereby discouraging mass redemptions of bank deposits. Third, the empirical evidence we have does not support the concern. A number of commentators made similar predictions in regard to the Federal Reserve’s ON RRP facility when it was first introduced.³ Ahnert and Macchiavelli (2021) find that money market funds that had access to the ON RRP facility during the 2013 debt-ceiling crisis exhibited greater stability relative to their peers that did not.

Finally, there are those who fear that the U.S. dollar’s status as a world

³While ON RRP is not technically a deposit facility, it operates like one.

reserve currency will be in jeopardy if the U.S. does not follow the lead of China, its main global competitor. There are a number of factors working against this outcome. First, a world reserve currency supplier must stand prepared to run potentially very large current account deficits. For better or worse, the United States is willing to do so. The Chinese economic model, however, encourages the exact opposite—something that is not likely to change anytime soon. Second, growth in the global demand for U.S. dollars, treasury securities, and dollar-denominated assets continues unabated. CBDC is not needed to encourage the global appetite for U.S. dollars.

Conclusions

There is much to like about CBDC at a conceptual level. Every person in the world is already has permissionless access to Federal Reserve liabilities in the form of paper currency. Why should the privilege not be extended to the digital component of Federal Reserve liabilities? This is a good question, but the example of physical currency may not be apt. First, payments made with physical currency are cleared and settled on a peer-to-peer basis. The Federal Reserve plays no role in facilitating such transactions, apart from providing the medium of exchange. Second, the technology associated with peer-to-peer currency exchange has not changed very much over time, apart from advances that have made counterfeiting more difficult.

CBDC, in contrast to physical cash, would require the services of an intermediary. It is a legitimate question to ask whether a central bank accustomed to serving a relatively small wholesale sector might possess the culture necessary to handle large-scale customer demands at the retail level. Relatedly, can one plausibly expect a public sector agency to keep pace with technological advances the way profit-seeking private enterprises are? Some recent evidence is not encouraging on this score. Compare, for example, how rapidly the *Clearing House* implemented its real-time payment system relative to *FedNow*, which is still in the works after years of consultation and deliberation. As Selgin (2021) has pointed out, proponents of CBDC who lament how the U.S. has fallen behind the rest of the world fail to note that the rest of the world is ahead not because other countries have CBDC, but because they have superior private sector payments arrangements. I would only amend his observation by changing “superior private” to “superior private-public” sector arrangements because no money and payments system is purely private or public enterprise—and the best outcomes tend to

occur through well-designed private-public collaborations.

In any case, even if the U.S. payments system is lagging the rest of the world in some respects, it is not light-years behind. More efficient protocols are being adopted and innovation in the fintech space is already advancing at a rapid pace. The remaining hurdles have more to do with the pricing power of large credit card companies and banks, together with inadequate legislation. If this is the case, then perhaps a wholesale CBDC is the way to go. The idea here would be to let companies like *PayPal*, *Square*, *Novi* and smaller fintechs gain access to Fed Master Accounts and the Fed's wholesale payment rails. Any non-bank with access to a Fed Master Account should be required to hold 100% of its assets either in reserves or treasury bills (and possibly longer dated treasury securities if access to the Fed's standing repo facility is also granted). In short, these firms should be granted something akin to a "narrow bank" charter. Other countries seem prepared to follow this route. The Bank of England (2017), for example, now permits non-bank PSPs to apply for settlement accounts in the Bank's RTGS system. Perhaps its time for the United States to follow suit.

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