



Comments on “Money and Payments: The U.S. Dollar in the Age of Digital Transformation” by Board of Governors of the Federal Reserve System, January 2022

<https://www.federalreserve.gov/publications/files/money-and-payments-20220120.pdf>
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Executive Summary:

A Central Bank Digital Currency would be an existential gamble in search of a problem. America’s financial and payment systems are among the best in the world, and remaining inefficiencies are largely due to overregulation, including by the Federal Reserve (Fed) itself. Despite these inefficiencies, well-functioning private sector workarounds already thrive, and can easily offer every alleged benefit of a CBDC without the catastrophic risks.

Key Risks:

1. A CBDC may drain a large proportion of deposits from commercial banks, effectively nationalizing the public’s savings and displacing free market allocation of capital, while bringing existential risk to our entire financial system. Both processes would expose the Federal Reserve to radically higher levels of politicization, a process already occurring in climate and equity.
2. A CBDC risks forcing millions of Americans to hand every financial detail to the government, amounting to a state-run panopticon that makes a mockery of the fourth amendment.
3. A CBDC can allow bureaucrats to veto any spending they dislike, to mandate any spending they desire, and to financially cripple any individual or business they dislike. China has already bragged about these features.
4. A CBDC can impose negative interest rates on depositors, forcing them to “spend it or lose it” in time for the next election. This dramatically increases the Federal

Reserve's ability to manipulate interest rates and therefore the economy, a discretion it has recently been ineffective at wielding.

5. The Federal Reserve admits CBDC's could increase the likelihood of bank runs, yet it also admits CBDC's can be programmed to limit transfers. This risks forcing the American public to go down with the ship if the Fed engineers another financial crisis.

6. A CBDC containing data and acting as the backbone of the U.S. financial system will likely be the single most valuable hacking target on earth. Given the Federal Reserve or Treasury's paltry programming capabilities and their compromised status as government agencies, a CBDC will be exceptionally vulnerable to these attacks.

In sum, a CBDC would be tearing off our roof and replacing it with kindling.

Enter your comments below (5,000 character maximum per question):

1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?

A CBDC is an existential gamble in search of a problem that risks the stability of our financial system and threatens a radical expansion of both state surveillance and of financial control by unelected bureaucrats lacking appropriate judicial oversight. It is inappropriate for the Federal Reserve to even contemplate such a dangerous experiment without explicit direction from Congress.

We have detailed several risks neglected in the paper including the potential of draining trillions from commercial deposits, resulting increases in financial instability, and concentration of economic power in what is, ultimately, a government agency. Broadly speaking, just as the federal reserve does not manage its own grocery stores, despite food unavailability potentially causing financial distress, it should not manage its own cryptocurrencies. Particularly when that management carries potential existential risks to financial markets, to fundamental political rights, and to the integrity of the US dollar.

A large cost neglected throughout the paper is the precise economic and social consequences of the Federal Reserve owning a potentially dominant share of private-sector assets. The paper admits that CBDC's are likely to result in much higher levels of Federal Reserve ownership of assets, which should raise concerns not just about state domination of our capital markets, but whether the Federal Reserve would be inviting

deeper political influence in its decisions and conduct. The Federal Reserve has heretofore taken care to avoid being seen as directing private capital beyond the minimum needed to ensure financial stability, and has been particularly cautious about purchasing discretionary assets like corporate equities. Were a CBDC to radically increase Federal Reserve holdings to a degree that ownership of controlling stakes in corporations became widespread, even standard practice, such prudence may become politically untenable. This would further move us away from free-market allocation of capital and towards a Communist model of capital allocation.

Ironically, the paper cites a concern from the President's Working Group that stablecoins' consolidation could someday lead to a concentration of economic power. The paper does not address the corollary that a CBDC, by concentrating the entire stablecoin industry into a single government-run version, then potentially adding trillions in commercial deposits to that pool, would constitute by definition an overwhelming concentration of economic power, this time in the hands of a government agency that is already highly politicized on topics as varied as climate change and social equity.

2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?

The paper states that a CBDC should provide benefits that exceed costs and risks, and do so more effectively than alternative methods. However, the paper does not engage in a rigorous assessment of the most obvious alternative method: private stablecoins. Instead comparing a putative CBDC to the strawman of legacy payment systems. On transaction cost and speed benefits, private stablecoins and even Bitcoin already offer instant settlement and near-zero fees; last August payments on Bitcoin's Lightning network averaged one satoshi, currently 1/3000 of a penny. <https://markets.businessinsider.com/news/currencies/the-lightning-network-is-driving-mainstream-bitcoin-adoption-2021-8>. Meanwhile, stablecoins could increase financial inclusion even more than a CBDC, given their lower compliance burdens on customers as well as the fact that, being a competitive industry, they can likely design and market consumer-friendly products better than the Federal Reserve can. Finally, stablecoin run-risk, mentioned in the paper, can be straightforwardly mitigated with oversight of stablecoin reserves.

In short, the paper explores creating a good that already exists in the private sector: a version of the US dollar that works reliably on blockchain infrastructure, and that provides excellent payment service and cost to a wide population. Rather than re-

inventing speculative wheels, it would be less burdensome and less risky to simply monitor the existing private stablecoin industry for fraud and for quality of reserves.

3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?

A CBDC would likely reduce financial inclusion, by “occupying the field” currently filled by private stablecoins, which offer superior privacy considerations and likely offer superior costs and user experience given competitive dynamics. World Bank research has found that [cost and trust](#) are the most important reasons Americans are unbanked. An intermediated CBDC model that includes not just commercial banks but an agency of the US government is likely to be more expensive than existing unintermediated private stablecoins, while such a model may worsen trust issues and further unsettle Americans who might prefer their banking remain private to government.

Many unbanked consumers are not financially or technologically sophisticated, so may resist banking on what is, to them, a cryptocurrency. While many others among the unbanked are abnormally privacy-minded, perhaps due to grey-market earnings, and may be strongly resistant to what they may see as a government-run cryptocurrency. In either case, a CBDC may be uniquely unsuited to address this population — too novel and risky for the financially wary, and too much government in the product for the privacy-minded.

Meanwhile, the paper mentions excellent existing projects to promote basic bank accounts such as Bank One, so any CBDC must be measured against those projects which, of course, do not raise fundamental threats to our financial system nor to individual rights.

4. How might a U.S. CBDC affect the Federal Reserve’s ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?

A CBDC likely introduces several risks to implementation of monetary policy, as well as the potential for deeply harmful collateral effects. Because a CBDC can be easily programmed to impose negative interest rates on users, the monetary zero bound disappears in proportion to CBDC uptake. To the extent the Federal Reserve is pursuing maximum employment goals at the expense of current inflation, this could lead to magnification of interest rates swings, exacerbating economic and financial instability.

Related, this increases the temptation for politicians to apply pressure to the Federal Reserve to, effectively, force consumer spending in order to drive up current employment. Adam Smith famously warned that discretion over the currency is akin to a “Waggonway in the sky” — a seeming benefit that carries enormous risk. Negative rates on deposits would be quite an escalation in this risk, and they further risk destabilizing the tenuous trade-off between employment and price stability with which the Federal Reserve already struggles.

CBDC’s can also easily be programmed to impose limits on the amount bought or sold. Indeed, the paper touts this feature to potentially attenuate the heightened risk of bank runs it freely grants CBDC’s may cause. While the candor is admirable, the paper fails to address that, during a financial crisis, CBDC’s could similarly be programmed to limit sales, potentially to zero. This could lock depositors in, forcing them to go down with the ship. As inconvenient as a bank run is for the banks involved, forcibly preventing bank runs, not by prudential oversight of banks, but by brute-force preventing consumer withdrawals risks catastrophic harm to American families in a crisis. If the Federal Reserve is imposing such a welfare trade-off, it should be explicit about its reasoning and about the probability-adjusted economic costs.

5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?

A CBDC could present a number of novel risks to financial stability, starting with the potential single point of failure inherent in the design. Considering the Federal Reserve has no expertise running anything on a blockchain, so would likely have to rely on partners chosen by an inevitably politicized process, perhaps not choosing on merit, this risk is magnified. Either way, that single point, as the backbone of the U.S. financial system, would become an irresistible magnet — a “honeypot” — for hackers, including state-sponsored hackers, seeking to steal money or assets, to steal or disrupt customer information, or to create mayhem in one of America’s most critical industries.

Yet larger risks come from the potentially privileged competitive threat that a CBDC would constitute to commercial banks, discussed in answer #6.

6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?

A CBDC raises serious concerns for the integrity of the financial sector. Because a CBDC lacks default risk, one of the core risks in commercial banking, without careful and ongoing design it could occasionally or permanently become inherently superior to a bank deposit. This means that, absent constant efforts to keep CBDC's unattractive to depositors in every financial scenario — an effort that should not be taken for granted given changing political dynamics — the CBDC could amount to a roundabout way to eliminate commercial banking. This could, however unwittingly, effectively impose a state-run capital regime on the United States, closer to what China, currently a prominent CBDC promoter, might impose.

Just as the “public option” was intentionally promoted by some during debate over the Affordable Care Act as an indirect way to wipe out private competition, a CBDC could stand as an existential “public option” threat to private banking. Even were a CBDC initially designed to be intentionally unattractive compared to bank deposits, the mere existence of this superior standing alternative to commercial deposits could immediately change behavior among commercial banks and their investors, dramatically reducing capital exposure, investments, and time horizons in the banking sector. Historically, even the prospect of nationalization of deposits has had an enormously disruptive effect long before the fact, and a CBDC may act as a standing threat awaiting the right politician.

The paper grants that CBDC's raise the risk of a run from commercial bank deposits towards the CBDC. However, given this inherent superiority, it is likely that were such a run to occur, the former depositors may be less willing to return to banks. This could give a ratchet effect that gradually shifts deposits to the Federal Reserve in every crisis, magnifying the perceived risk to commercial banks and their investors.

It should be noted that this risk does not exist from private stablecoins, which do not occupy a privileged risk profile given they are not a liability of the central bank.

7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?

One possibility that avoids threatening commercial deposit banking is to render the code of the CBDC unalterable. This would mitigate risk to commercial banking, assuming the CBDC were initially designed to be unattractive to bank depositors. Of course, this inalterability could likely make the CBDC vulnerable to increased hacking attacks, as well as hasten its obsolescence.

A second risk discussed has been that of execution given the Federal Reserve's paltry expertise in blockchains. The most obvious solution is to use intermediaries who do have that expertise. Of course, existing government agencies do try this, often with mixed results. Moreover, to the extent intermediaries are used, it could negate some or all of the alleged costs savings from using a CBDC in the first place. After all, if intermediaries are used that approximate private—sector expertise, this will likely cost the Federal Reserve as much or more than it costs those existing firms, while adding an additional layer of a bureaucratic Federal Reserve on top.

8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?

Paper cash remains popular, *inter alia*, for its ease of person-to-person use, for its privacy features such as evading a domestic abuser, and for its last-resort insurance function such as in a natural disaster. If CBDC's accelerate the disappearance of cash, this may cause enormous hardship to people who find themselves in such situations. Some people will doubtless seek out other last-resort media, such as foreign currency or gold, but empirically the vast majority probably will not. The Federal Reserve should thus make efforts to retain wide enough usage of paper cash that it remains widely accepted. The efficacy and economic impact of such efforts should be credibly estimated and included in a tally of the cost-benefits of a CBDC.

9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?

In the absence of a CBDC, domestic and cross-border payments will likely continue improving at a dramatic speed. Private service providers such as Apple Pay and Venmo have made great strides in quality and price of service for domestic payments. Meanwhile, stablecoins and cryptocurrencies such as Bitcoin are increasingly used for low-cost cross-border payments, at prices approximating small fractions of a penny.

Indeed, a CBDC could put these innovations at risk, effectively "occupying the field" and chasing out existing and future private-sector providers. This risk comes at little benefit; the paper itself outlines several sources of friction in cross-border payments, including "currency exchange, variations in different countries' legal regimes and technological infrastructure, time zone complications, and coordination problems among intermediaries, including correspondent banks and nonbank financial service providers."

Of these 5 sources of friction, a CBDC alone meaningfully solves none of them compared to current methods. In contrast, a private stablecoin or even Bitcoin, because they permit payments to bypass the traditional banking system altogether, could substantially improve all of these five frictions but the time zone and currency risk. Even currency risk can be mitigated by private stablecoins since many large exporters also import, so they may actually want to keep substantial reserves in dollars, yet CBDC's remove this option if the payment must pass through traditional banks in each country.

10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?

Perhaps counterintuitively, if other countries issue CBDC's while the US does not, it would likely improve the dominance of the US dollar. The key mechanism is if those other countries "occupy the field" for stablecoins in their own markets, they effectively reduce demand for private stablecoins denominated in their own currency. If private sector stablecoins prove more attractive to users than government-controlled versions, which we might expect given competitive dynamics and less red tape, then each country that issues its own CBDC effectively takes itself out of the running to be the standard currency used in the most popular global payment mediums.

We might expect, then, that increased issuance of CBDCs by foreign governments could actually reinforce today's US dollar dominance of online payments, reinforcing the network effect from exchange rates and ease as unit of account. Indeed, this process is already quite advanced, as USD stablecoins dominate the industry worldwide, while Chinese Yuan (CNY) denominated stablecoins are moribund. Perhaps the greatest gift China could give the US dollar is to rigorously promote their own CBDC, hence decimating private-sector CNY-denominated mediums.

11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?

Beyond mitigating security and competition risks discussed in answer #7, mitigation of privacy concerns could occur by licensing outside agencies to own that data. This would obviously raise a number of issues, not only in choosing and monitoring such partners, but in whether the Federal Reserve, as an agency of the federal government, has the power to even access that information.

To mitigate the risk that CBDC's "occupy the field," and cripple existing private stablecoins, in theory the Federal Reserve could consider granting legal tender or other privileges to an existing private stablecoin to promote its wider use in domestic or cross-border payments. This would obviously raise a number of fundamental risks, from single point of failure to politicization of the process of selecting and managing of such a coin, which suggest this is a bad idea.

Another feature that could mitigate trust and security issues surrounding a CBDC would be maintaining the code open-source. This is quite standard in cryptocurrencies, indeed it is expected, and could increase consumer acceptance and confidence in their ability to assess the hacking risk. Of course, keeping a CBDC, that is the backbone of the financial system, open-source could potentially open it to increased hacking risks in the first place, it could be untenable given military or law enforcement priorities, and at any rate those risk trade-offs are likely to be poorly understood by the Federal Reserve given its lack of expertise.

12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?

Privacy would likely present an impossible challenge to a CBDC under our Constitution. The paper asserts, correctly, that "Any CBDC would need to strike an appropriate balance between safeguarding consumer privacy rights and affording the transparency necessary to deter criminal activity." This is likely impossible; because a CBDC would need to be unable to facilitate illicit activity under the Bank Secrecy Act, it would necessarily need information on individuals. While Banks are able to collect this information, in many cases a government agency may not be. Further, this information, once deposited in government possession, may lack important judicial safeguards to misuse. Finally, it is not credible to assume that information collection will be minimal; given the one-size-fits-all design of a CBDC, it may require as much information from all users as it does from the most extreme users — suspected terrorists, say. Beyond privacy concerns, such a honeypot of centralized personal information would be an astoundingly attractive hacking target, almost guaranteeing on a long enough timeline that it will indeed be hacked. Such a risk, and the likely economic consequences to potentially hundreds of millions of Americans, must be credibly quantified in any responsible cost-benefit analysis of a CBDC.

13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?

Cryptocurrencies have been targets of hackers since their inception due to their novel architecture and the possibility of anonymous receipt of hacking proceeds, particularly in early coins. These attacks sometimes target the assets themselves, they sometimes aim to cripple the blockchain instead, and where anti-money laundering (AML) and know your customer (KYC) data is collected, such as exchanges, hackers also focus on stealing information.

As a result of this, there is today a well-trained and global veritable army of hackers who the Federal Reserve will almost certainly be unable to match. It will thus likely need to rely on outside contractors or private-sector partnering organizations. This would not only attenuate putative cost savings, it could raise management and legal questions, as well as further expose the Federal Reserve to outside political pressure. A CBDC could be a uniquely attractive honeypot defended by a uniquely incompetent and politically compromised guard.

14. Should a CBDC be legal tender?

A CBDC should not be legal tender because the risks outlined above suggest it should touch as few important parts of the financial system as possible. Ideally, to the extent that a CBDC is explored as an academic exercise, it should remain an experimental “sandbox” where no important transactions occur.

One interesting idea is to use the “dual legal tender” model implemented last year in El Salvador, in that case designating both the US dollar and Bitcoin as legal tender. Of course, Bitcoin does not enjoy the default privilege that a CBDC might, so it avoids the existential threats to deposit banking discussed. Still, such a model could theoretically be used to designate an existing private stablecoin as dual tender, which is briefly discussed, and rejected, in answer #11.

CBDC Design

15. Should a CBDC pay interest? If so, why and how? If not, why not?

No, because paying interest on CBDC’s magnifies the risk of draining deposits from commercial banks, which risks effectively nationalizing both retail banking and the nation’s private savings. If such were to occur, the Federal Reserve would likely become subject to perhaps overwhelming political pressure to then deploy these government-controlled savings towards pet projects or simply towards funding federal

deficits, which creates moral hazard for Congress and the executive to increase spending. In effect, private savings could become a piggy-bank for federal spending.

16. Should the amount of CBDC held by a single end-user be subject to quantity limits?

Yes, individual holdings of CBDCs should be limited. Without that limit, a CBDC could amount to an unlegislated arbitrary increase in the current deposit insurance limits. This would further increase the competitive risk CBDC's pose to commercial bank deposits, further draining private savings towards Federal Reserve control.

17. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?

Given the core functions of intermediaries include managing customer information and onboarding and serving accounts, commercial banks are the obvious choice. Of course, because a CBDC threatens to obsolesce their core business, good-faith cooperation cannot be assumed and the banks may need substantial oversight, subject to gaming. Noting that commercial banks employ very smart people, this gaming may evolve in ways the Federal Reserve is unable to predict. Beyond monitoring, this process should ideally reduce AML/KYC and other regulatory burdens to address the very transaction and administrative costs raised in the paper as justification for considering CBDC's.

Finally, assuming a transition would be gradual in order to minimize market and industry disruption, the process of introduction would itself have to be tightly monitored for unexpected behavior by depositors, and for unexpected counter-measures by the very banking partners presumably relied upon to manage the new competing CBDC. In short, it seems very likely that this process will yield one or more crises for the Federal Reserve and for the financial industry.

18. Should a CBDC have "offline" capabilities? If so, how might that be achieved?

It is always better for a money to have "offline" capabilities, but in the case of a CBDC this would likely have to be in the form of physical tokens, either sold directly by the Federal Reserve or via intermediaries. Such physical representations are not a common practice with existing cryptocurrencies, whether stablecoins or traditional crypto, so

there is probably little demand for it, assuming some form of physical cash remains in wide usage, about which please see answer #8.

19. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?

No, a CBDC should not be designed specifically for point of sale. Existing private-sector payment systems are established, widespread, and well-run, including ApplePay, Venmo, or the Strike app for Bitcoin Lightning payments. The Federal Reserve has no experience designing and operating such systems and apps, so it should rely on such partners to design and market payment systems, just as they do today with fundamentally hard-to-use tokens such as Bitcoin or federal reserve notes.

20. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?

Cryptocurrencies today, including stablecoins, run on a wide variety of platforms, sometimes accessing multiple platforms to achieve a transaction. This can happen at low cost and seamlessly to the customer, because substantial engineering resources have been deployed, including generation and propagation of novel programming languages and innovative tools such as Lightning Network. The good news is that a CBDC, however poorly designed from a technical perspective, would likely benefit from this infrastructure and knowhow so as to be transferable across multiple platforms easily and cheaply. The bad news is that regulatory constraints may be higher with a CBDC than they are with normal cryptocurrencies or stablecoins, such that this existing infrastructure could be unable to experiment and tweak interfaces, rendering a CBDC at a critical, and self-inflicted, disadvantage. In theory, the Federal Reserve or some other agency could make up the gap, expending resources to achieve similar ease and costs as the private sector would, but in practice this seem unlikely given expertise and legal constraints ranging from inability to tolerate illicit usage to legal constraints on gathering personal information as a government agency.

21. How might future technological innovations affect design and policy choices related to CBDC?

The cryptocurrency space is moving very fast — it's a challenge even for experts to keep up with new technologies, even new words. Therefore, it is almost certain that a

CBDC will be obsolete before it is even released. This means that design choices should be extraordinarily simple, indeed humble, and not aim to add too many features. The model here is Bitcoin, which despite a very simple design has endured for 13 years by relying on outside partners, such as wallet or Lightning developers, to keep the product useful, while remaining as simple as possible and also remaining robust to outside attack.

22. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?

An important mechanism used in the cryptocurrency community is open code architecture — every aspect of the code must be transparent and easily visible to anybody in the world. This allows thousands of professionals and amateur coders to easily police the code, and it is critical to maintaining trust in the currency. If a CBDC is to be trusted to the degree it competes with both bank deposits and with existing stablecoins and cryptocurrencies, it should ideally have an open-source design that enables stakeholders to see what's happening to their money, and to assess any risks. This openness obviously presents potential conflicts with national security or law enforcement priorities, which may ultimately render the CBDC a doomed concept given the poor market survivability of closed-source coins and their dramatically reduced public acceptance.

A final important design point: a key debate within cryptocurrencies has been the trade-off between adding features and increasing attack surface. There is a broad recognition that simpler code, hence simpler features, reduces the opportunity for potential hackers, while more complexity inevitably equals more attacks. Given that, on a long enough timeline, some percent of those attacks will succeed, and given the exponentially greater attractiveness of hacking a CBDC, both for private hackers and state-sponsored hackers, this wisdom should not be lost in the design stage of a CBDC. Indeed, given those stakes, a very strong starting assumption should be to keep the code as simple as possible.