



September 22, 2021

How CBDC's May Impact Inflation

Michael Ashton

Andrew Fately

Susan Joseph

With momentum building behind CBDCs, it is time to ask about how this new form of money will impact our every day lives. Privacy/anonymity issues come to mind as well as what type of impact will these currencies have on inflation. Given the recent extraordinary monetary policies that have been implemented around the world, this article explores the potential impact CBDCs will have on prices as well as on spending.



Currently, two of the most widely discussed topics in financial and economic circles are inflation and central bank digital currencies (CBDC's). Up until now, the two conversations have run in parallel with little or no thought given to how the latter may impact the former. We will combine the two topics to highlight some of the potential outcomes of the introduction of a CBDC to the inflationary topic.

As a CBDC will be a type of money, we begin with a brief overview of what money represents, followed by a readily accessible understanding of inflation. Finally, we point out how we believe a CBDC can alter the current monetary framework with respect to its impact on inflation going forward.

What Causes a Currency to Become Money?

Anyone with a printing press can make a currency, and many have. A currency is not *money*, though, until it meets certain characteristics. It must be generally trusted to be both a medium of exchange and a store of value. A third characteristic that is usually ascribed to money is derived from the first two just mentioned: money as a 'unit of account'. If a currency is trusted to be a store of value, and it is trusted to be a medium of exchange, then it will naturally serve as a unit of account.

Trust is critical. It is not a trivial thing, to develop this trust, but it is crucial. We emphasize that it is crucial in each of the two dimensions, which are distinct. People may trust that an item is a good store of value, but not trust that it will be accepted in exchange for the goods and services that they need. An example of this would be residential real estate. Or, people may trust that an item is a good medium of exchange, but not trust it as a store of value.

A trip back in time to 1922 and Weimar Germany can illustrate how the papiermark, which literally means paper mark, was printed in excess by the Reichsbank (German central bank) and was the coin of the realm and thus widely used for commerce. However, excessive printing led it to lose its value so rapidly that stories of prices rising between the time someone ordered dinner and the time they ate became common.

As a picture is often said to be worth a thousand words, we think of a "money trust matrix" as a useful tool. We have laid out the "money trust matrix" below, with some hypothetical placements for various currencies, would-be currencies, and other assets for illustration.

This is an especially useful tool in the context of our discussion about CBDCs because it helps highlight how a CBDC differs from cryptocurrencies.[1]

We find that much of the discussion and debate about cryptocurrencies occurs around the topic of the possibility that certain cryptocurrencies could serve as better stores of value than government-run fiat currencies. Unfortunately, the other dimension, its ability to serve as an effective medium of exchange, is sometimes neglected in these conversations. If a digital currency ends up being a good store of value but is not accepted in exchange for regular purchases, then it is merely an investment not much different than gold.

What is Inflation?

Inflation is generally thought of as a repeated increase in the prices of goods and services, so that a unit of currency buys less over time. This way of looking at inflation, though, is confusing when we are talking about money as a store of value. Since one dollar always equals one dollar, thinking about inflation as a change in the price of goods and services makes it sound like it is something about the goods themselves that is changing. Indeed, the current debate about whether inflation is “transitory” is often muddled by debate about supply and demand conditions for specific products, such as the higher prices for used cars that have been recently highlighted.[2]

But inflation is better thought of as an alteration of the value of money itself, apart from the conditions in product markets. An apt example may be found in the airline loyalty mile industry. When airline miles were first introduced by American Airlines in May 1981, 20,000 miles could typically be exchanged for a round-trip coach-class ticket within the continental US, with some restrictions. For years, this was true: if you had 100,000 American Airlines AAdvantage miles in your account, you owned the value of five tickets no matter what happened to the airfare in dollars. However, in 1995 the major airlines changed the number of miles needed to claim a free ticket to 25,000.[3] Those same 100,000 miles were suddenly worth only **four** tickets.

What changed? The ticket prices (in dollar terms) did not suddenly rise 25% overnight. What changed was that the currency itself was devalued – in this case, airline miles became suddenly less valuable. So, airline loyalty miles were an excellent store of value, although only exchangeable for plane tickets, until they weren't. But what changed was not the value of the flight. What changed was the value of the “currency.”

So too it is with dollar bills, or euros, or any other currency. Inflation is not what happens when the cost of goods and services rise; it's what happens when the value of money used to buy those things falls. Thus, when we are talking about changing something fundamental about the nature of money itself, it is useful to consider the implications that change may have on the value of money itself, and on the trust that people have that the value of that money will be stable, so that it serves as a useful store of value.

Therefore, the question of how money is created, and what limits exist on its creation, is fundamentally important. For example, in the hands of a profligate central bank, the ability to create money without bound creates the risk of inflation without bound.

Turning our focus to CBDC's, currently there are two basic models for the design of a digital currency that are apparently under consideration: the indirect or institutional model, and the direct or retail model. How might these work, and what are the possible implications of the choice?

The Institutional Model

How it could work

This model would be designed such that the Federal Reserve creates a digital dollar which it utilizes either in addition to, or in lieu of the ordinary bank reserves that are currently the mainstay of the central bank commercial bank nexus. The difference would be that digital dollars would be made available to commercial bank customers as directly spendable currency, rather than being reliant on the mechanism that exists today: the creation of a lending transaction to start the money creation process.

This is a major change in philosophy as it would essentially sever the link between borrowing money and spending it. This would also result in significant changes in the current commercial banking model as net interest margin would become a less important part of a bank's earnings, as loan volumes are likely to decrease even more, requiring an increasing reliance on fee-based income. What could be important for consumers is that products like free checking may become a relic of the past under this model.

One possible scenario would have each commercial bank open a digital dollar account with the Federal Reserve which could then be credited with digital dollars (we will call them e-dollars for the rest of the paper) whenever the Fed desired. This could be in payment for Treasury purchases, similarly to the way the current system works, or merely created at the behest of the Treasury Secretary in order to add additional liquidity to the economy.

However, the transmission mechanism would still require the commercial bank to push that currency into the real economy in some manner. The direct solution would be for the commercial bank to simply credit their customer accounts with additional dollars, thus balancing their own books (liability to customer, asset from Fed). However, in the event the Fed did purchase Treasury securities and paid with e-dollars those pesky commercial loans would still be required to create the desired increase in money. In other words, it is not clear that this method would offer any substantive advantages over the current system.

Possible Outcomes

A major concern of the Institutional model is that the banks, and their management, would be the first to receive that inflow of additional money. When central banks deposit spendable reserves in a commercial bank's account, it seems likely that some portion, if not all, of those funds would wind up

as bank profits, dramatically increasing the banks' wealth compared to the rest of the economy that is a further step removed from the CBDC process. While this would not be a desirable outcome in any situation, it would be especially fraught in the current sociopolitical framework.

The Retail Model

How it Could Work

This model, on the other hand, offers far more possibilities for the Fed with respect to altering its monetary policy procedures if the goal is to exert a more direct control over the creation of money.

The first thing to consider is whether the Fed itself would want to be involved in opening an account for all the nation's denizens. It would seem unlikely that the Fed is interested in becoming entangled in retail banking and all that implies. Know-Your-Customer (KYC) procedures alone would be a nightmare (although, of course, Anti-Money-Laundering (AML) concerns could be tightly controlled by the Fed). If we discard this idea of direct individual accounts at the Fed, two likely possibilities remain: either commercial banks open e-dollar accounts for all their clients automatically, or a non-bank financial (NBF) company bids to take on the task.

Consider a PayPal or Venmo type account that does the retail work of distribution upon receipt of its allotment of e-dollars from the Fed. Right now, either of these two models, or a combination of the two, seems plausible. Arguably, younger generations who are more comfortable with Venmo style payment apps will be quick to adapt to additional funds there, whereas Baby Boomers may be more comfortable remaining with the banks that they know. An additional potential benefit of this model would be the likely acceleration of innovation in the payments space as many FinTech companies would vie to create even better solutions than these initial two efforts.

In either of these two possible Retail Model outcomes, the end result is the same: the Federal Reserve will gain the ability to directly create and inject money into the economy. In the current vernacular, they will truly have the ability to print money.

Possible Outcomes

One feature of the retail model that may tip the scales in its favor is this model will give the central bank the ability to directly inject cash into accounts of anybody with valid identity, whether or not they have a traditional bank account.[4] For instance, one is not required to have a bank account to have a Venmo account. An individual can simply have a Venmo card which acts much like a pre-paid debit card. This offers the central bank a great opportunity to ensure that a greater share of the

population receives any funds being disbursed and could go a long way to serving the underbanked and unbanked in a more efficient and effective manner. In addition, it is likely that the government can direct these funds to specific accounts of those individuals in the lower income brackets.

How Will a CBDC Change the Process?

Understanding the current state of affairs enables us to consider some potential future inflationary outcomes of the introduction of CBDC's. While a CBDC may be a change in the form of money, it will not change the laws of economics, merely the agents through which those laws act.

Base Case

Arguably, the base case is that the Federal Reserve remains beholden to its current econometric models and does not alter monetary policy in any meaningful way. While the newly created e-dollars would offer many possibilities, if the Fed chooses the Institutional Model (substituting a CBDC asset for a bank reserve asset of the exact same magnitude and usefulness), it will not alter the current monetary framework. Rather, it will create a new tool in their monetary toolbox, something which they desperately need given the current paucity of available tools. But the concept of the Fed continuing down its QE path, focusing on maximum employment and issuing forward guidance is likely to remain in place. The promise of direct injection of funds to the economy will continue to be a Treasury led affair, with the Fed only tangentially involved in the process.

Edge Case Number 1 – The Slippery Slope

It seems highly unlikely that the Fed, or any central bank for that matter, would go through all the trouble of creating a CBDC to simply use it to replace bank reserves. Instead, it seems far more likely that central banks will see this new tool as something that can be effective in implementing policies that have proven to be difficult to achieve in the aftermath of the Global Financial Crisis (GFC), such as generating the desired amount of measured inflation. By this time, we are all aware that the central banking community writ large believes that a steady inflation rate of 2.0% per year is consistent with ongoing economic growth and the ability to achieve maximum employment. A side benefit is that steady inflation will reduce the real value of the government's outstanding debt, thus arguably allowing repayment over time without creating undue economic hardship via austerity.

The introduction of a CBDC, however, can quickly change this equation. In its most basic form, inflation is a result of too much money chasing too few goods and services. The absence of inflation after the introduction of QE in 2009 in the US (2001 in Japan) was finally understood to be the result of the lack of commercial bank lending activity rather than the absence of bank reserves to support

that type of activity (the Fed presumably always understood this, since the introduction of Interest on Reserves (IOR) to disincentivize lending makes little sense otherwise). Central bank reliance on commercial banks to transmit monetary policy was the weak link in the chain, and its lack was the reason that the money supply (e.g., M2) never accelerated dangerously and measured inflation never rose significantly.

A CBDC offers a different, direct mechanism for central banks to get spending money into the hands of the population. Via the Retail Model, the central bank can simply credit every CBDC account with \$500 or \$1,000 or any amount it chooses, which should reduce or eliminate the friction of the current transmission mechanism via bank loans. The central bank can even turbocharge that impact by either imposing a negative interest rate on the account balances or imposing an expiration date on the ability to use the balances in the individual account. This turbocharging would encourage the immediate utilization of these balances as most people will certainly not want to miss the opportunity of 'getting something for nothing.'

And consider, if the early experience by the central bank is favorable, it would likely lead to a permanent change to all currency becoming CBDC, rather than any parallel system that is almost certainly to be implemented in the initial years. At that stage, negative interest rates on funds held are likely to exist for the entire front end of the yield curve as an encouragement for individuals to either spend their funds or invest them in longer term assets. Hoarding of cash will be strongly discouraged by policymakers.

Edge Case Number 2 – MMT Lite

A more concerning outcome might come about under pressure from Congress in the form of a reduction in Fed independence. The marriage of fiscal and monetary policies, both *de jure* and *de facto*, has the opportunity for some very significant policy (and by extension, economic) impacts.

Fed independence is an issue that has gained a great deal of attention lately as the Fed's actions seem to be more and more synchronized with Treasury requests. This is a very different interpretation of the Federal Reserve Act than had historically been the case. William McChesney Martin (Fed Chair from 1951-1970) famously described the Fed's role in the economy, in a 1955 speech, to be "... in the position of the chaperone who has ordered the punch bowl removed just when the party was really warming up." [5] In other words, historically, the Fed attempted to moderate the business cycle, not allowing it to run too hot or to cool off too much, as it sought to achieve its goals of full employment and stable prices.

The GFC, however, seems to have served as a starting point for a change in that view. Since then, the Fed even throughout the entire post GFC recovery, was actively engaged in the economy, maintaining policy rates at zero or near zero for the entire period of growth, while expanding their balance sheet. This had the dual benefit of injecting more reserves into the economy while sopping up a large portion of Treasury debt issuance and supporting those prices.

Modern Monetary Theory (MMT) is not actually very modern. It has been seen numerous times throughout history, starting with the Roman Empire. Succinctly, it states that any country that issues debt in its own currency has no risk of default as it can simply print the currency necessary to repay the debt when it comes due; therefore, there is no reason to allow any slack in the economy (meaning unemployment) as the government can always pay people to dig holes and others to fill them in, thus creating paid 'employment'. The one main constraint included in the MMT prescription is that it should be stopped only when inflation gets too high.

We have seen this theory in action before, most famously in Weimar Germany in 1922 and more recently in Zimbabwe in 2008-9 and in Venezuela today. Of course, all of these are examples of hyperinflation, the potential endgame for MMT.

This is where CBDCs come into the picture. The marginal effort to create the currency to repay any debt is diminished to zero, as there is no need for paper, ink or printing presses to achieve the same ends. There is nothing to prevent the Fed from simply pressing the magic button every time another debt security matures to deliver e-dollars to all the bond holders. This will have the result of more money entering the system despite no increase in the amount of goods or value that is created: thus, depreciating the value of each of those e-dollars.

As such, a very powerful monetary tool like a CBDC must be used judiciously if it is to be effective in promoting economic activity without generating significant inflationary pressures in the economy. It is this feature of a CBDC that has generated concern in more conservative and monetarist circles. Judicious use of a powerful tool has not been the hallmark of elected officials throughout history, and it does not seem likely that this situation will be any different.

The Future of Banks

An interesting question that would be raised by the introduction of CBDC's via the Retail Model is the impact on the banking sector. While banks would still perform a critical function within the financial markets, their role in several different areas would be greatly diminished. Consider the very basics of banking; a bank is an institution that takes deposits and makes loans. The value of

any bank accrues from the fact that it can manage the timing mismatch of its assets (long-term loans) and liabilities (short-term deposits) while maintaining the lion's share of the spread in interest it paid to depositors and earned from lenders. But what happens in this new world?

One possibility is the effective resurrection of Glass-Steagall separating the commercial banking portion of the business from the capital markets and investment banking portion. Under a CBDC model, the central bank will have much greater control over the amount of money in the system and will have perfect clarity as to what individuals are doing with that money.

Commercial banks may well see their utility function diminish greatly, becoming custodians with a lending business. It would be no surprise to see leverage ratios reined in significantly, thus reducing systemic risk and ensuring that the central bank was not underwriting that risk. This could break the cycle of privatizing profits while socializing losses that has been in effect since the GFC.

At the same time the other, non-bank, functions currently performed by banks (underwriting debt and equities; market-making interest rate, foreign exchange and commodities in cash and derivatives markets) can be removed to a separate company that will rely on its own capital-raising ability and be able to actually go bust without causing systemic risk. So, supply chain finance remains part of the banking world... swapping fixed to floating, not so much.

Of course, this would have a dramatic impact on the value of these organizations, and likely not in a positive manner. The current symbiosis of the two sides of universal banks would be split and the safety of the commercial banking piece would no longer underpin the investment banking risk, while the returns available to the investment banking activities would no longer enhance the bank holding company's overall profitability. In this instance, the implementation of CBDCs could easily be considered an unalloyed good for society!

Final Thoughts

The ongoing global efforts to develop and issue CBDCs are going to continue. It is a virtual certainty that within some finite amount of time – perhaps three years, five years, or certainly before the end of the decade – CBDCs are going to be the major, if not the only game in town. We have tried to outline some of the potential ramifications of the introduction of this new technology to the archaic world of central banking and monetary policy.

The primary concern we have is that CBDCs may significantly change the inflation rubric of the post GFC years, from an inability of central banks to achieve their targets to a concern that higher inflation will be a permanent feature of the future. But this is not the only issue extant. The impact

on commercial banking will be large and uncertain, although potentially negative from a valuation perspective.

While there are clear potential benefits, especially with respect to the implementation of payments systems both domestically and internationally, the question is at what cost are these benefits to be achieved? Gresham's Law outlines the idea that bad money will always drive out good. In this context, if CBDC's are a step toward a more inflationary future, you can be sure that monetary alternatives – whether Bitcoin, some new cryptocurrency, or gold will be in high demand. It argues that central banks, as they head down this road, need to be incredibly cognizant of the risks attendant to bad designs, as well as incredibly vigilant over the utilization of this new, extremely powerful monetary tool.

[1] CBDCs are intended to be legal tender issued by government in digital form. Cryptocurrencies are digitally native currencies associated with particular blockchains.

[2] See for example “Why used-car prices are driving U.S. inflation higher — and why it won't last,” Marketwatch.com, July 17 2021. Retrieved July 27, 2021. Link to story:
<https://www.marketwatch.com/story/why-used-car-prices-are-driving-u-s-inflation-higher-and-why-it-wont-last-11626193391>

[3] <https://www.chicagotribune.com/news/ct-xpm-1994-12-04-9412250203-story.html>

[4] According to the FDIC's 2019 Survey, approximately 5.4% of the population is unbanked.
<https://www.fdic.gov/analysis/household-survey/index.html>

[5] “Tim Taylor Sends Us to William McChesney Martin's Punchbowl Speech (October 19, 1955)”, blog post on Grasping Reality by Brad Long. <https://www.bradford-delong.com/2013/06/tim-taylor-sends-us-to-william-mcchesney-martins-punchbowl-speech-october-19-1955.html>
(<https://www.bradford-delong.com/2013/06/tim-taylor-sends-us-to-william-mcchesney-martins-punchbowl-speech-october-19-1955.html>).

Photo Credit: by **Rūdolfs Klintsons** (https://www.pexels.com/@rudonni?utm_content=attributionCopyText&utm_medium=referral&utm_source=pexels) from **Pexels** (https://www.pexels.com/photo/art-dark-dirty-sign-7097113/?utm_content=attributionCopyText&utm_medium=referral&utm_source=pexels)

• • •

Michael Ashton (<https://www.linkedin.com/in/michael-ashton-cfa-735875/>) is Managing Principal at Enduring Investments. Mr. Ashton is a pioneer in the U.S. inflation derivatives market. Prior to founding Enduring Investments, Mr. Ashton worked in research, sales and trading for several large investment banks including Bankers Trust, Barclays Capital, and J.P. Morgan. Since 2003, when he traded the first interbank U.S. CPI swaps, and 2004 when he was the lead market maker for the CME's CPI Futures contract, he has played an integral role in developing new instruments and methods for accessing and hedging various inflation exposures. In 2016, Mr. Ashton published *What's Wrong With Money? The Biggest Bubble of All*. He is a graduate of Trinity University and lives in Morristown, New Jersey.

Andrew Fately (<https://www.linkedin.com/in/andy-fately-3973a91/>) is Executive Director, Foreign Exchange, Treasury Unit of Global Markets Marketing Department at Sumitomo Mitsui Banking Corporation Americas Division. Prior to joining SMBC, Andrew was Chief Strategist at 9th Gear Technologies, a New York-based Fintech company where he helped to launch and bring to market the company's new FX payment product. Andrew previously worked 35 years in numerous areas of capital markets across trading, sales and management roles for several global financial institutions, including RBC, Barclays Bank, ING, Kidder Peabody and Lehman Brothers. His has traded currencies, currency options, precious metals options and government bond options and managing businesses in all those markets.

Susan Joseph (<https://www.linkedin.com/in/susangjoseph/>), a JD/MBA and former General Counsel, is CEO/Founder of Healthrends.ai, an NSF grant awardee (public health informatics using blockchain), Executive Director, Fintech at Cornell, Cornell SC Johnson College of Business, Cornell University, Principal at SusanJosephLLC, (consulting for the mining industry in climate, digitization, and blockchain), and Executive Director (pro bono) of Diversity in Blockchain-a 501(c)(3) entity that provides education and resources to support diversity and inclusion in the blockchain space. She has been consulting and advising in law, blockchain and fintech for the past five years in the areas of digital assets, cryptocurrencies, insurance, enterprise distributed ledgers, ESG (climate and diversity), identity and privacy, and other issues across financial services, insurance, and supply chain. Susan advised RiskStream (Insurance Consortium) on their Civics Program and was formerly the B3i North America Representative (Insurance Consortium). She created and ran Blockchain Working Groups for Global Insurers and was the first Executive Director of ID2020. Susan is a part of the World Economic Forum Expert Network and runs the womeninfintech network on LinkedIn.