

MONEY REDESIGNED

Paper 1: Central Bank Digital Currencies and Asymmetric Disintermediation

June 2020

In December 2018, we published our IIF paper [Asymmetric Disintermediation](#), highlighting some issues where the advent of new platform deposits and central bank digital currencies (CBDCs) could potentially impact the stability of bank funding, even as banks were expected to continue providing credit into the economy.¹

Various developments since that time have elevated these issues, with new momentum on the potential redesign of ‘money’. With initiatives from various central banks to explore CBDCs as well as first two iterations of the Libra white paper, it is an appropriate juncture for us to refresh our Asymmetric Intermediation analysis, starting in this first paper with a focus on potential CBDC models.

This paper starts with an examination of specific examples of consumer/investor behavior, where significant large movements of savings/investments have been observed with other digital currencies/assets. These illustrate the potential for major impacts on bank funding and financial stability, and where there are key CBDC design considerations that should be heeded.

1. Consumer/Investor Behaviors

We are yet to see the live scenario of a CBDC in action, much as that moment seems to be approaching. However, we can extrapolate some signals of potential consumer/investor behavior from observed examples where funds have moved from fiat to other instruments at the times of particular events.

COVID-19 Demand for Cash

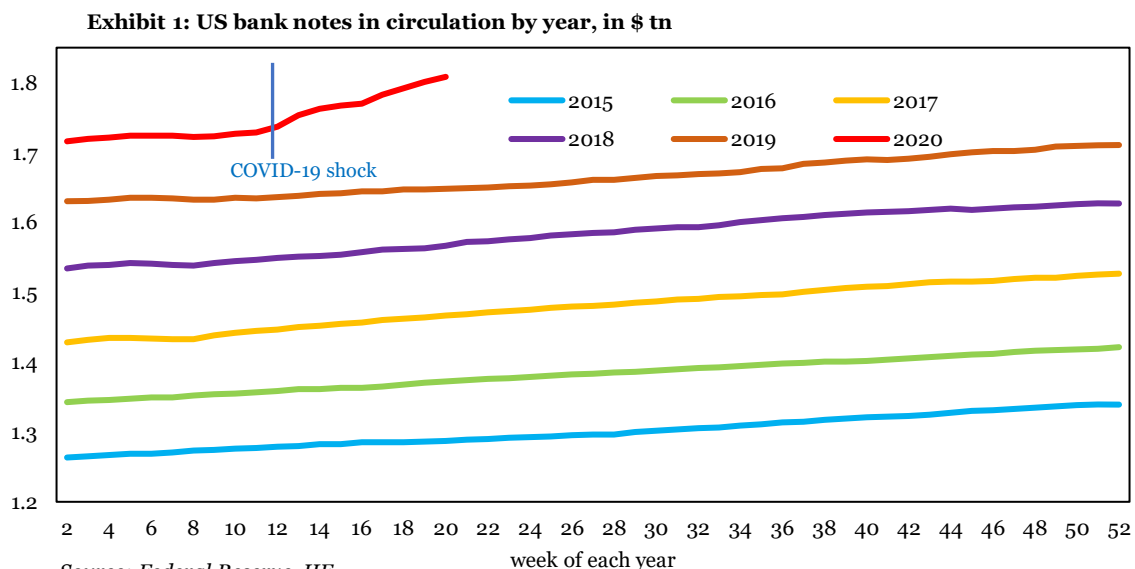
Individuals and households have a long-documented tendency to hoard cash during periods of crisis. The introduction of CBDC and mobile wallets could amplify and accelerate this behavior as they remove the friction and effort required to physically obtain and secure cash. Facilitating this shift from banks to the central bank during a crisis could exacerbate the liquidity and lending seizures that central banks work to combat during these times of stress.

The COVID-19 pandemic has seen cash being increasingly hoarded, but not used in transactions. The considerable concerns about the hygiene of physical banknotes has driven an acceleration of the shift to cashless means of payment, but it has not deterred the hoarding behavior (see Exhibit 1).

¹ <https://www.iif.com/Publications/ID/3198/Asymmetric-Disintermediation>

This emphasizes the propensity for some to move assets out of intermediaries during a crisis. As governments around the world issued economic shutdowns and shelter in place orders, the following behaviors were observed:

- The total stock of U.S. dollar banknotes jumped by \$70 billion in March 2020 (red line in Exhibit 1). This was a week-to-week increase of 1.75% and is the fastest weekly increase in cash in circulation since the Y-2000 changeover in December 1999. Statistics also show that large denominations bills were in high demand in mid-March in affluent neighborhoods of Seattle and New York.



- There was an increase in demand for cash in the euro area in mid-March as the weekly increase in the value of banknotes in circulation almost reached the historical peak of €19 billion² despite an accompanying surge in contactless payments and increase in contactless limits.
- The UK’s main ATM cash machine network, LINK, reports that while cash use is on the decline since COVID-19 prompted stay-at-home mandates, cash withdrawal amounts are increasing on a weekly basis. LINK's data reveals the average weekly withdrawal has jumped from \$81 to \$103.³
- Several governments included advice to citizens to hold cash among updated emergency preparedness guidelines (Canada, US, Sweden).

Bitcoin Trading Events

There have been some notable cases in recent years where large volumes of funds have moved from fiat to Bitcoin, seemingly triggered by a risk event. While we are skeptical of Bitcoin’s properties as a store of value, noting the historical price instability and limited acceptance, there have been occasions when the notion of Bitcoin as ‘digital gold’ attracted considerable inflows from investors concerned with the outlook for their domestic financial system.

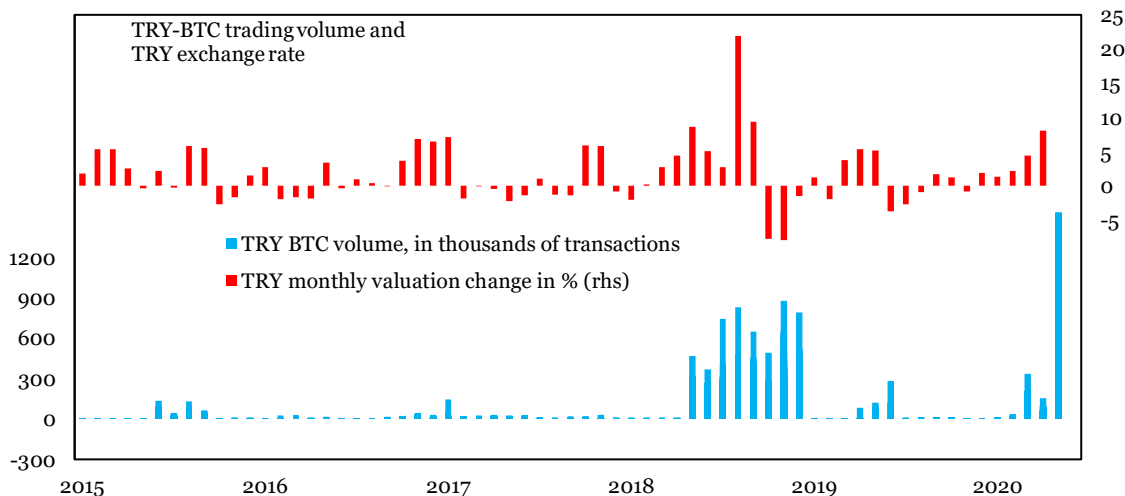
² Blog post by Fabio Panetta, Member of the Executive Board of the ECB, (April 28, 2020): “[Beyond monetary policy – protecting the continuity and safety of payments during the coronavirus crisis](#)”.

³ “UK cash use is down but weekly atm withdrawal amounts increase” ATM Marketplace, May 1, 2020, Pat Shea

We highlight some of these examples, stressing that these are merely indicative of the behavior of where funds can quickly move – and emphasizing that where the alternative is not merely Bitcoin, but rather a CBDC backed by a strong central bank with a stable value and universal acceptance, these impacts could be considerably greater.

In recent observed behavior, we have seen how cryptocurrencies are gaining momentum as hedging assets against currencies under FX pressure, most visibly in the case of the Turkish Lira. Recent periods of stress for the TRY, such as the late-2018 devaluation cycle or the recent COVID-19 shock (red bars in Exhibit 2) have translated into increased transactions in the BTC/TRY cross (blue bars in Exhibit 2).

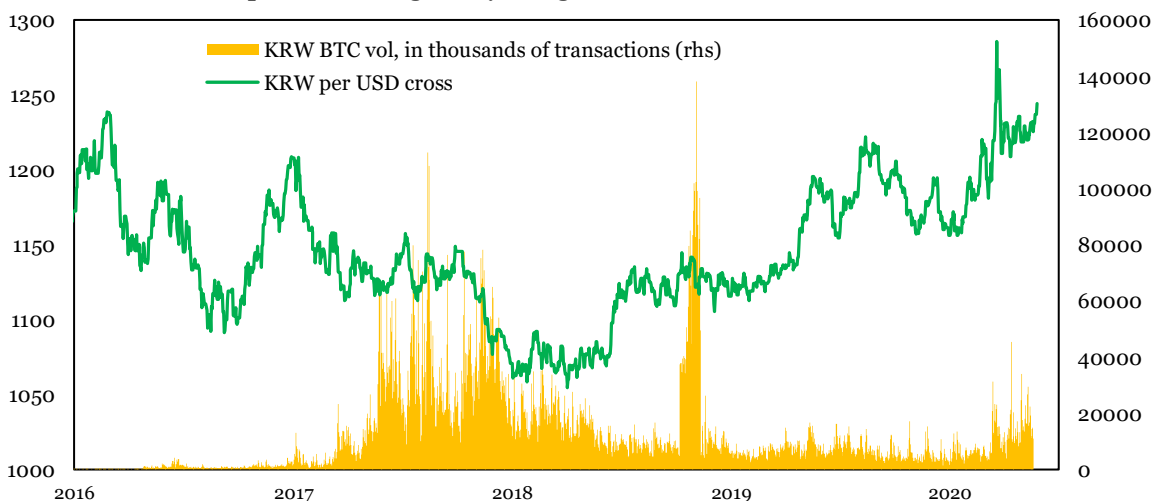
Exhibit 2: BTC volumes react to FX pressure...



Source: CryptoCompare, Haver, IIF

Likewise, regulatory changes (such as the banning of BTC operations in CNY around 2017), and periods of heightened political stress have seen the usage of crypto assets. Take the example of the late-2017 geopolitical tensions in Korea that accompanied the Bitcoin price spike – the notion of “digital gold” (Exhibit 3). This effect could be further amplified if alternative instruments with superior security and value stability are available.

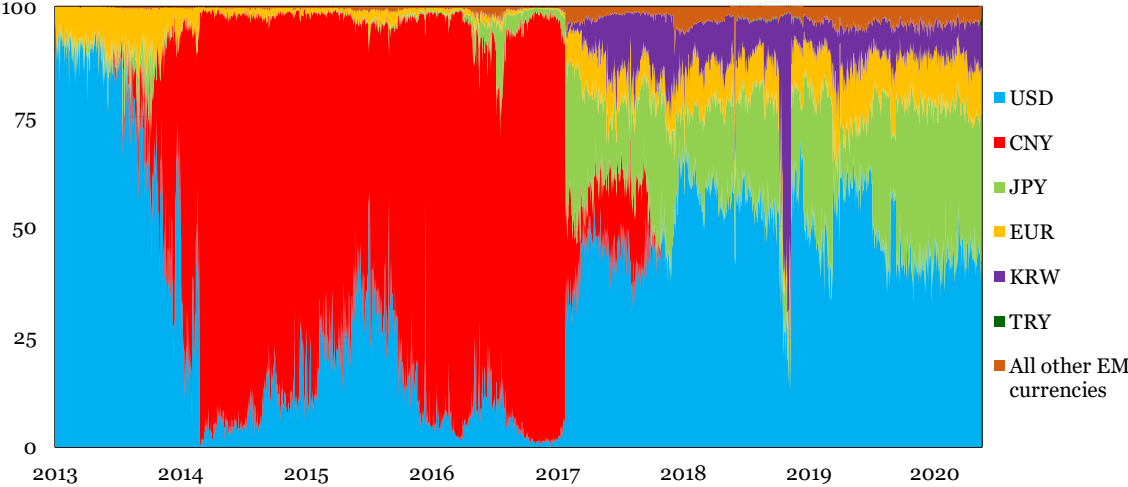
Exhibit 3: ... as well as political and regulatory changes.



Source: CryptoCompare, Haver, IIF

Up until 2017, the CNY as well as the USD and to a lesser extent the EUR were the main crossings with cryptocurrencies (Exhibit 4), however as time went by and especially with the emergence of stable coins (such as the USD Tether Coin in Exhibit 5) but also product of regulatory changes, we have seen that a wider share of currencies are being utilized alongside cryptocurrencies (Exhibit 5).

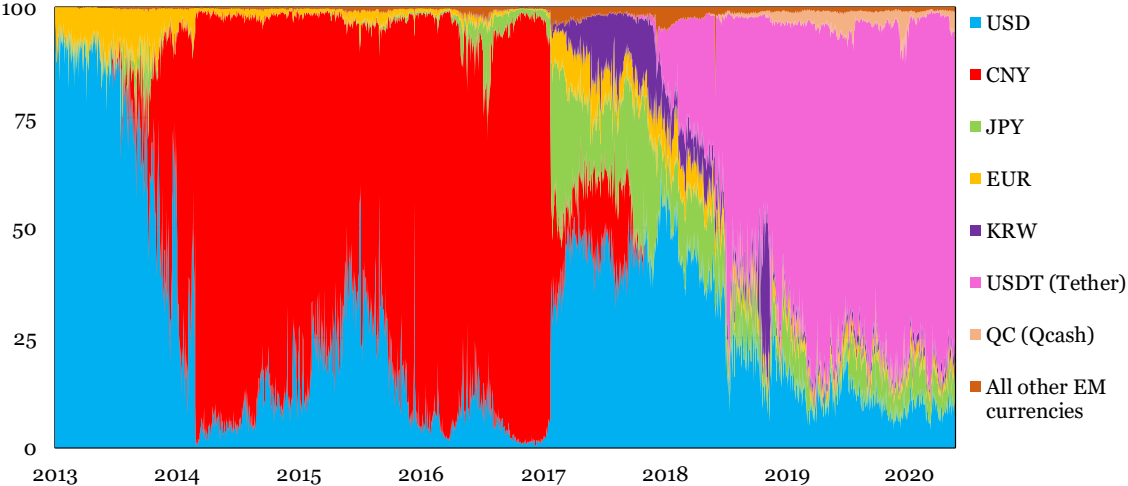
Exhibit 4: BTC volume operation by currency (in thousands of transactions).



Source: CryptoCompare, Haver, IIF

This emergence of stable coins, and the pronounced activity that has emerged over the last two years (pink and light orange in Exhibit 5) provides a further gauge on the added potential for funds to shift quickly when a more stable alternative is available to investors, and could represent a portent of conditions once a CBDC is available.

Exhibit 5: BTC volume operation including stable coins (in thousands of transactions).



Source: CryptoCompare, Haver, IIF

2. CBDCs and Potential Impacts for Bank Funding

There are several potential models for the form that a CBDC may take, including on the extent to which banks or other private sector firms are able to participate. A series of key design considerations was well summarized by Santander's John Whelan in the IIF 'Future of Money' webinar on April 21, namely:⁴

1. Wholesale vs Retail; and if retail, direct consumer to central bank, or via a commercial bank;
2. Account-based vs token-based;
3. Degree of programmability; and
4. Degree of transaction privacy.

We focus this analysis on the first of these considerations, specifically on the ability of retail (or corporate) customers to access and use a CBDC, and whether they might do so directly (facing the central bank), or via an intermediary, such as a regulated commercial bank. Even within this singular consideration, the scenarios are not binary: there may be different levels of private sector participation, in areas such as customer service, identity and know-your-customer verification, as well as the question that gets to bank funding: whose balance sheet is recording the customer's holdings as a liability?

Where a citizen (or a business) has the opportunity to deposit their savings directly at the central bank, the BIS has previously warned that such access could exacerbate a bank run during periods of instability, as customers could take the opportunity to switch their savings out of a vulnerable institution and into a central bank, and at a higher velocity than previously possible.⁵ This is consistent with the potential we highlight above, with reference to investors that have made that switch even when only assets like Bitcoin were available.

Moreover, we believe some of this leakage of deposit funding away from commercial banks could in fact occur at any point in the economic cycle, as some risk-averse customers would likely choose the assumed relative safety of their domestic central bank over a commercial bank, against an incremental interest rate differential. While that may offer customers some benefits in their expanded choice, it presents some significant policy questions that we highlighted in our previous Asymmetric Disintermediation paper, including:

- Are central banks prepared to manage an increased liability of citizens' savings?
- Would the ability of citizens to switch create an added volatility in the money supply that central banks would have to manage? Would this impact monetary policy effectiveness?
- How would constraints on maturity transformation and fractional reserve banking affect the money supply, and the cost of and availability of credit?
- If commercial banks' deposits contract, but society wishes for them to continue to take the commercial risk and lend to the economy,⁶ what is the mechanism for the central bank to transmit those funds back to the banks?

⁴ IIF, Future of Money webinar, April 21, 2020, <https://www.iif.com/Events/RSVP-Event?meetingid={58C26743-1078-EA11-80E1-000D3A0EE4ED}>

⁵ Committee on Payments and Market Infrastructures, "Central Bank Digital Currencies," March 2018, see <https://www.bis.org/cpmi/publ/d174.pdf>

⁶ Benoît Cœuré "The future of central bank money" (at the International Center for Monetary and Banking Studies on May 14, 2018) noted that maturity mismatch externalities are better managed within the banking sector than within market-based finance; see <https://www.bis.org/review/r180518a.htm>

It also presents issues for supervisors with respect to the Liquidity Coverage Ratio (LCR) and Net Stable Funding Ratio (NSFR). One of the key lessons from the financial crisis was the need for many banks to rebalance their funding mixes, reducing their reliance on short-term wholesale funding, and instead looking more to customer deposits, a trend that has been sustained over the last decade, and is now embedded by the Basel III LCR and NSFR measures. The regulatory weightings in the LCR and NSFR calculations convey a heavy preference for retail deposit funding, assessed as being more ‘sticky’.⁷

But the emergence of a direct CBDC could challenge those assumptions, if retail customers are able to easily switch their savings from a commercial bank to a direct holding at the central bank. As well as presenting challenges for financial stability and for the financing of the economy, this could precipitate the need for more dynamic approaches to assessing and supervising liquidity risk, perhaps hastening the development of new liquidity standards, or a switch in supervisory emphasis away from those existing ratios and towards other approaches such as liquidity stress testing.

Furthermore, while the primary focus of the NSFR and LCR is on retail deposits, effective liquidity risk management requires some diversity in funding sources. In this sense, it is important to also consider the impact that a CBDC might have for other depositors also, such as corporate and small enterprise customers. Significantly, such customers’ bank deposits are generally not covered by deposit insurance schemes, further increasing the risk that they could quickly move in a situation of market uncertainty.

We should also not ignore the potential added complication if a new market was to emerge for trading between a CBDC and a ‘traditional’ fiat, with the possibility for a whole new set of instruments and derivatives. Beyond the first-order effects for funding and liquidity, this could invite a further layer of unexpected consequences.

3. Consumer Claim vs Security

Riksbank Governor Stefan Ingves cites that a citizen has always had the right and ability to hold a direct claim on the central bank, in the form of holding physical banknotes.⁸ In the context, the seemingly inevitable move to a cashless economy presents a philosophical question for governments and central banks: is that in fact a citizen’s ‘right’, and should it be preserved in an increasingly digitalized economy? In this context, the Riksbank initiative could be perceived as simply one of modernizing that right, moving with the times.

However, there is a fundamental difference that emerges with the issue of security. In the past (and the present still, in most economies), if a citizen chose to hold that claim on the central bank in the form of physically holding banknotes, that citizen had to find a way to store and protect those banknotes, whether in a personal safe, hidden under the mattress, or other. There was essentially a trade-off that the citizen would have to weigh up: they could hold a claim directly on the central bank, but they then had to assume responsibility for the physical security of their claim.

The advent of a direct CBDC absolves the citizen of that security responsibility. Suddenly, they can have it all: the direct claim, and the security of their claim provided for them. Or to put it another way, they no longer have to choose between private sector credit risk and their own security risk.

⁷ See Basel Committee on Banking Supervision, “Basel III: The Net Stable Funding Ratio,” October 2014, which refers to deposits from retail and SME customers as “behaviorally more stable” than other funding sources; <https://www.bis.org/bcbs/publ/d295.pdf>

⁸ IIF, FRT Episode 42: Riksbank Governor Stefan Ingves, July 8, 2019, <https://www.iif.com/Publications/ID/3428/FRT-Episode-42-Riksbank-Governor-Stefan-Ingves>

This could offer some obvious benefits for the consumer/investor, but it amplifies the potential threat of asymmetric disintermediation, redirecting commercial banks' funding bases to the central bank while expecting those commercial banks to continue lending to the economy.

As well as that question of risk profile, the other side to the investor's trade-off is their potential return. Where some have raised the topic of remuneration, or whether interest is paid on CBDC holdings, this would presumably not be the case if the intent is merely to modernize the ability to hold "banknotes". But a central bank may find the ability to apply an interest rate (whether positive or potential negative) attractive as means of monetary policy transmission.

The return question is especially topical with the current environment of historically low interest rates. Assuming a CBDC is not remunerated, there may be limited appeal to instead deposit funds in a commercial bank at current market interest rates. If banks had to pay higher margins to attract funds, there are consequential impacts for bank profitability and/or borrowers' lending costs, each of which can have adverse macroeconomic consequences, particularly with current conditions. This could potentially be addressed by applying a negative interest rate on CBDC holdings, though such a move would be controversial and broach a key psychological threshold.

Weighing this risk and return equation also leads to the issue of deposit insurance, and another key policy question:

- How would savings held in a CBDC directly at the central bank interact with (or compare to) existing deposit insurance schemes for deposits at commercial banks?

It may be that deposit insurance on central bank CBDC exposures is deemed unnecessary, or that it is heavily correlated, representing an overlay of central bank risk and national government risk. If deposit insurance continues to apply to bank deposits but not CBDC holdings, the rationale for an informed retail investor to suddenly shift their funds would be minimized.

However, that would still leave the issue for corporates and small businesses, being depositor types that are generally not covered by deposit insurance. While those customers are valued less under the LCR and NSFR requirements, they are nevertheless an important part for many banks' customer bases, and for a balanced funding profile.

It may be that other CBDC designs need to be considered, including where regulated (and insured) banks play a role in facilitating customers' access to a CBDC, as the 'wallet providers'. This could leverage banks' digital identity capabilities, where banks address the customers' security risk, and where banks are able to utilize the holdings in the wallet as a funding source, essentially a modernized deposit. Such solutions need further development, but this is indicative of the type of exploration needed.

4. Solutions to support financial stability

In contemplating potential disintermediation effects from deposit leakages, it is important to consider the need for banks to provide credit into the economy – which is all the more critical at the moment. The COVID-19 shock and the consequent lockdowns have pushed authorities around the world to react with unprecedented speed and aggression in trying to limit the economic fallout. Major central banks, which have responded quickly, innovatively, and forcefully, are placing a great amount of monetary accommodation in the market, which in turn opens the question of the efficiency of these measures to benefit the greater portion of the market. While broad-based lending programs and asset purchase schemes should alleviate stresses in financial markets and help keep some companies afloat, monetary policy can only do so much to help otherwise sound businesses that have suddenly seen revenues evaporate. Monetary policy will arguably be even less potent when it comes to addressing cratering consumer demand if, as expected, unemployment soars. After all,

interest rates were already skirting the “*zero lower bound*” in much of the world and not much higher elsewhere, even before the crisis began.

Furthermore, the major economic disruptions from the COVID-19 crisis have not only affected output and unemployment, but they have also presented major problems for alternate lenders that rely on wholesale (or other non-deposit) funding sources, such as securitization markets for their SME loans.⁹

It is therefore vital that CBDC developments consider the most effective ways to limit the potential for crowding out bank deposits, both structurally and in crisis situations. This may mean considering the particular roles that commercial banks might play in a CBDC ecosystem, and whether there is merit in a combination of bank-provided wallets and deposit insurance. To the trade-offs presented to a customer, it may be that a commercial bank provides them with secured access to their holdings.

While we have focused our analysis on the bank funding and financial stability considerations, careful consideration of the roles and responsibilities for the private sector is also critical for know-your-customer (KYC) and due diligence. Potential challenges in the realm of digital identity, dispute resolution, KYC and related services have been traditionally managed by financial institutions, and central banks need to consider the extent to which they can leverage those capabilities, as an alternative to taking on those responsibilities themselves – which would require a massive expansion of operations, well beyond existing mandates.

It is important to confront these issues of bank funding and system stability, as we do concurrently note that CBDCs can offer some attractive capabilities for central banks’ policy toolkit in targeted liquidity interventions. CBDCs can become a real policy toolkit alternative to elevate the efficiency of resource allocation across the economy. For example, several setups of CBDCs promote the idea of injecting liquidity into market segments in a more direct fashion than classical monetary easing strategies. At the same time, the speed of liquidity injection could be increased if using a digital currency. But this will need specialized agents that act as buffers and contain fail-safe mechanisms to ensure the proper utilization of the currency.

Next Steps

There is still much to do in exploring and examining optimal designs and potential solutions for CBDCs, to ensure such innovations can help reinforce (and not undermine) system stability and economic growth. We will continue to explore this topic, and welcome the recent contributions added to the wider debate from thought-leaders such as the BIS, the BoE and the Digital Dollar Foundation. The IIF will also explore some other initiatives and key features in the future of money. Further papers in our Money Redesigned series will look at the potential impacts of private multi-currency stable coins, the intersection with Digital Identity, and a refreshed view on platform deposits.

⁹ <https://www.ft.com/content/91ded873-9f16-4c4d-bdb1-9bfa44507850>



Brad Carr
Managing Director, Digital Finance
bcarr@iif.com



Conan French
Senior Advisor, Digital Finance
cfrench@iif.com



Jonathan Fortun
Economist, Global Macroeconomics
jfortun@iif.com



Dora Perjesi
Dora contributed to this report during her Fulbright internship at the IIF, and has since returned to her role at the Central Bank of Hungary.