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GLOBAL MACRO RESEARCH CENTRAL BANK DIGITAL CURRENCIES

THE EVOLUTION OF CASH

APRIL 2022



EXECUTIVE SUMMARY

- Central bank digital currencies (CBDCs) represent a new and safer form of digital payment, which are being investigated and developed by central banks around the world **3**

- We outline the six reasons central banks are seeking to launch CBDCs:
 - 1** To increase the efficiency of payments, particularly in cross-border transactions
 - 2** To increase the resilience of payment systems
 - 3** To increase financial inclusion
 - 4** To lay the foundations of a future digital economy
 - 5** To improve the efficiency of the implementation of monetary and fiscal policy
 - 6** To allow governments to defend their monetary sovereignty **5**

- From the various implications of CBDCs for economies and markets, we believe the most significant is the ability to target fiscal policy in unprecedented ways **6**

- In the race for implementation, China and Sweden are currently ahead of the pack with the US moving only slowly. Over the long term, this could lead to pressure on the US dollar as it loses market share as the predominant reserve currency **8**

- The implementation of CBDCs will require taking several technical decisions. While our central case scenario is that the choices will have limited repercussions, there are some risks. The most notable is the potential for a diminished role of commercial banks in the international financial system **9**

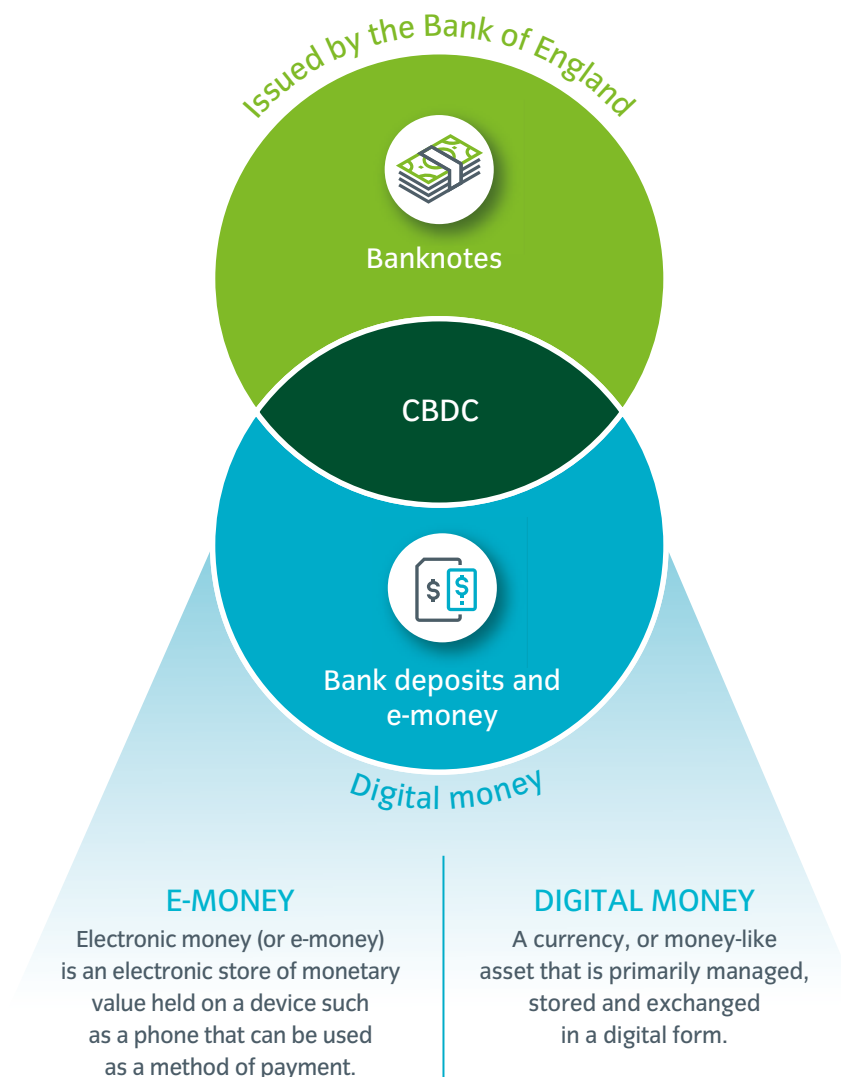
A NEW, SAFER, FORM OF DIGITAL PAYMENT

CBDCS ARE A DIGITAL FORM OF BANK NOTE

- They are legal tender.
- As with a bank note, they have a direct claim on the balance sheet of the central bank, limiting their credit risk. This differs from a bank deposit which is a claim against the balance sheet of a commercial bank for any amount above that guaranteed by the state.
- They differ from cryptocurrencies as transactions occur in a government-sponsored network rather than a private network.

This means that CBDCs attempt to provide some of the benefits of digital currencies, but within the safety of a centralised public network (see Figure 1).

Figure 1: A CBDC is a digital form of bank note¹



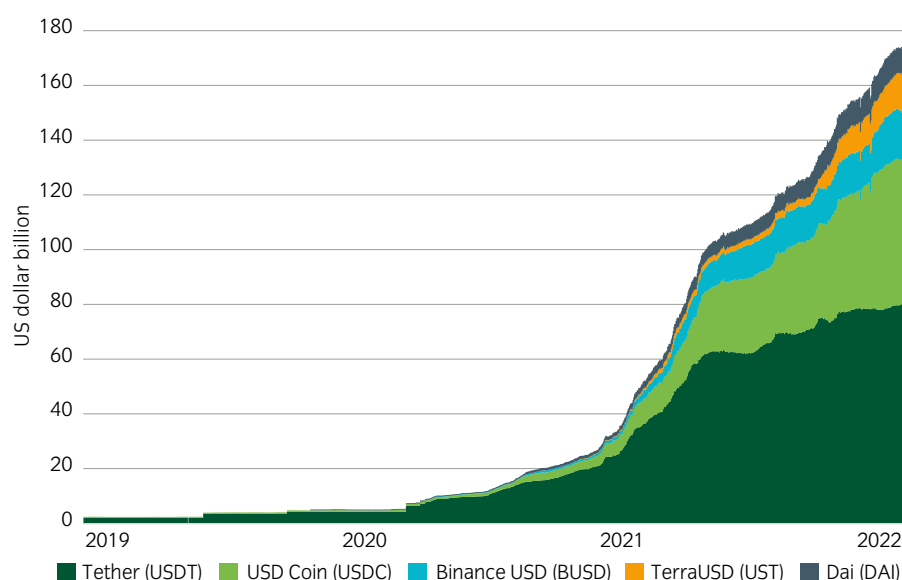
¹ Source: Bank of England Digital Currencies: opportunities, challenges and design, March 12, 2020.

STABLECOINS ACCELERATED THE INTEREST IN CBDCs

AS THE MARKET IN PRIVATE DIGITAL CURRENCIES HAS EVOLVED, CENTRAL BANK INTEREST IN CBDCs HAS GROWN. INITIALLY, THE VOLATILITY, LIMITED SPEED OF PAYMENT PROCESSING AND ENERGY INEFFICIENCY APPEARED LIKELY TO LIMIT THE USE OF PRIVATE DIGITAL CURRENCIES SUCH AS BITCOIN TO THAT OF A HIGHLY SPECULATIVE ASSET. THIS CHANGED DRAMATICALLY WITH THE INTRODUCTION OF STABLECOINS.

A stablecoin is a private digital currency, the value of which is pegged to an asset such as the US dollar. In order to credibly maintain this link, the stablecoin needs to be substantially, if not entirely, backed by holdings of the asset to which it is pegged. Most stablecoins are pegged to the US dollar, and hold a combination of Treasury bills, commercial paper, corporate bonds, cash and other assets. In effect, most stablecoins are akin to a government money market fund that can be used to make direct payments – critically, they look and behave just like traditional forms of money, with low transaction costs, albeit the potential for greater credit risk.

Figure 2: The outstanding value of major stablecoins has risen substantially in recent years²



As the outstanding value of stablecoins has grown (see Figure 2), so the ecosystem of decentralised finance (DeFi)³, which supports stablecoins, has broadened. This has made it possible to lend and accrue interest with very limited regulation, creating the potential for future systemic risk and creating a sense of urgency among central banks to push forward with their own CBDCs.

² Source: Insight and CoinGecko. Data as at 18 March 2022.

³ Decentralised finance is an emerging financial technology that is based on secure distributed ledgers, similar to those used by cryptocurrencies. This allows financial instruments to be traded without the need for an intermediary such as a bank.

SIX REASONS CENTRAL BANKS ARE SEEKING TO LAUNCH CBDCS

1 To increase the efficiency of payments, particularly in cross-border transactions.

Although there have been some recent initiatives designed to increase the speed of payments, including the Faster Payments System (FPS) in the UK and FedNow in the US, pockets of inefficiency remain. The most notable is in international transfers, where payments to emerging market economies remain especially costly.

2 To increase the resilience of payment systems. Large technology firms are increasingly venturing into financial services, and in doing so they are able to leverage user data that has been collected from their historical business models. There is a risk that a small number of companies could become dominant players in the digital transaction market, with potential consequences for market competitiveness and increased systemic risk. This situation already exists in China, where two firms jointly account for over 90% of the mobile payments market. CBDCs would reduce this risk or provide an alternative form of payment in countries where private companies are already dominant.

3 To increase financial inclusion. According to the World Bank, 1.7 billion adults globally do not have access to a bank account – and even in the US, around 5% of the population has no bank account. CBDCs don't rely on the existence of a locally available commercial banking network, allowing their use even in remote areas of emerging economies where financial integration is lowest.

4 To lay the foundations of a future digital economy. A secure form of digital legal tender is key to the creation and development of innovations such as smart contracts, where payments can be automatically executed based on terms that are written into code as part of a blockchain.

5 To improve the efficiency of the implementation of monetary and fiscal policy. On the monetary side, the existence of CBDCs would allow central banks to extend the implementation of negative rates to cash – something that is not possible with physical banknotes. On the fiscal side, a stimulus in CBDC form could, for example, be programmable. This could allow targeting of specific groups, inclusion of an expiration date to ensure that money was spent within a set timeframe or enable restrictions to ensure stimulus was spent on specific items such as food.

6 To allow governments to defend their monetary sovereignty. Perhaps the most important reason of all, a CBDC allows a government to retain its sovereign currency in a world where the choice of private digital currencies is growing rapidly. If private digital currencies were to become dominant, then commercial banks would find themselves competing with the sponsors of those private digital currencies for deposits. This could impact both the allocation of credit through the economy and the assessment of credit risk. More fundamentally, if a significant element of 'money' is no longer denominated in a country's sovereign currency, then monetary policy becomes less effective and the ability to respond to financial risks becomes limited – traditionally problems that occur in emerging market economies that become overly dollarised.



IMPLICATIONS FOR ECONOMIES AND MARKETS

MONETARY POLICY

IMPACT: Small, assuming CBDCs are not interest-bearing

A significant question is whether CBDCs are interest-bearing or not. If they are, then it allows changes in monetary policy to be instantly transmitted into the economy and should significantly increase the effectiveness of negative interest rates. However, it would also call into question the role of commercial bank deposits – why risk your capital in a bank if you can hold an interest-bearing CBDC? This could become especially problematic during periods of financial stress, as there could be a rapid flight to quality out of the banking sector. Our sense, based on central-bank discussion papers and pilots such as the e-CNY and e-krona, is that CBDCs will be non-interest bearing. This could in fact make negative interest rates even less effective than they currently are, as it is more practical to hoard CBDCs than physical bank notes, effectively creating a floor to interest rates at zero.

FISCAL POLICY

IMPACT: Large, as it allows fiscal policy to be more efficiently implemented

Assuming that every citizen is provided with a CBDC account at the central bank then the fiscal policy implications of CBDCs are profound. In 2021, Federal Reserve Vice-Chair Lael Brainard noted that although stimulus payments were rapidly made to those with bank accounts, reaching those without bank accounts took several months. Stimulus payments made via CBDCs would be instantaneous, and immediately reach the entire population. The greater acceptance of direct stimulus payments as a policy tool suggests that this may become more common in future downturns.

The other notable feature of CBDCs is their programmability. A stimulus could be made with a set expiry date, requiring the money to be spent by a certain date or lost, improving the fiscal multiplier. During the pandemic, it was estimated that around 60% of stimulus cheques were either saved or used to pay down debt, limiting their impact on the broader economy. The CBDC could also be programmed such that it could only be spent on specific items such as food, rental payments, education or healthcare.

One issue that needs to be monitored is how CBDCs impact the independence of central banks – although we assume that central banks would act purely as distributors of fiscal stimulus on behalf of governments, the stimulus would impact money supply, which has historically been within the remit of independent central banks. Assuming that can be managed effectively then CBDCs have the potential to dramatically increase the effectiveness of fiscal policy, accelerating the shift from monetary to fiscal dominance.

COMMERCIAL BANKING SECTOR

IMPACT: Small, assuming that the CBDC is well designed, but with the potential for disruption if not

CBDCs potentially impact the commercial banking sector in three ways:

1. If every citizen has a CBDC account at the central bank, it reduces the need for commercial bank accounts. Retail deposits are one of the cheapest sources of funding available to the banking sector, and if there is a shift towards holding excess cash or savings in CBDC form it would remove this source of funding for commercial banks.
2. If transactions can be more safely executed via a CBDC, it removes the need for commercial banks acting as intermediary, and with it their ability to charge transaction and foreign exchange fees.

3. If CBDCs are interest-bearing then they would become an alternative to commercial bank deposits. In order to compete with a CBDC, banks would need to offer more attractive interest rates, driving up costs.

We believe that central banks are acutely aware of the potential disruption that CBDCs could bring to commercial banking and are looking at ways to minimise the impact. This could include using commercial banks as intermediaries for CBDC accounts and limiting the amount of a CBDC that can be held by an individual. For example, the European Central Bank (ECB) has discussed a limit of €3,000. In the US, directly offering digital wallets or accounts would potentially give the Federal Reserve access to detailed transaction information. This could be a politically sensitive issue and would likely be perceived by some as an overstep of its mandate.

NON-BANK LENDING

IMPACT: Potentially large, but would need regulatory change

In a scenario where CBDCs were widely taken up, the loss of deposits within the banking sector would negatively impact the amount that banks could lend. This could encourage alternative sources of lending from outside the banking sector. Although this would face some regulatory hurdles, the Bank for International Settlements (BIS) argues⁴ that greater competition for deposits and from new entrants to the financial sector would improve financial sector resilience. Switzerland has been one of the first to embrace this view, allowing fintech firms access to the interbank market via their CBDC infrastructure without the need for a full banking licence.

US DOLLAR RESERVE CURRENCY STATUS

IMPACT: Small, but if the US continues to move slowly the dollar may suffer at the margin

As the world's reserve currency, the US dollar is used in most currency transactions and makes up a significant component of most central banks' foreign currency reserves. This creates a natural demand for US dollar assets such as US Treasuries, reducing the cost of borrowing for the US government and allowing the US to run a larger current account deficit than would otherwise be the case.

The US has been slow to discuss the development of a CBDC relative to other central banks. The ECB and People's Bank of China (PBoC) have been more ambitious, hoping that the launch of CBDCs would lead to greater international use of their currencies. There is speculation that the e-CNY could eventually rival the US dollar, as China is seen by some as a safe haven for assets that can't be targeted by the West – an issue which has become a focal point after the sanctions imposed on the FX reserves of the Central Bank of Russia.

We view this as a remote possibility; China still retains currency controls and lacks the transparency and deep capital market liquidity that would be needed for reserve currency status. That said, if the US continues to move slowly, it is possible that faster moving central banks may have some success in improving the international appeal of their CBDCs, leading to some diversification of FX reserves and negatively impacting the US dollar at the margin.

⁴Source: Central bank digital currencies: financial stability implications, September 2021

THE RACE FOR IMPLEMENTATION IS ON

WITHIN MAJOR ECONOMIES, TWO COUNTRIES STAND OUT AS BEING FAR AHEAD OF THE PACK IN THEIR DEVELOPMENT OF CBDCs: CHINA AND SWEDEN.

CHINA: THE E-CNY

The PBoC has run multiple pilots of the e-CNY across different cities, with the expectation of a formal launch later in 2022. The PBoC differs from other central banks in that there are no published papers explaining the development process, but it appears that the e-CNY will be a direct substitute for cash; it is non-interest-bearing, direct and anonymous. The digital wallets that hold e-CNY will not be legally considered bank accounts, reducing the regulatory burden and potentially increasing the international appeal, although the current limit of \$1,500 for non-Chinese residents will hold back international use if maintained.

Part of the motivation behind the launch of the e-CNY is to provide competition for the dominant private digital currencies, Alipay and WeChat, which together account for over 90% of online transactions. This has meant pilot schemes have relied heavily on smartphone use, with users needing a registered telephone number rather than a bank account. The need for a smartphone likely limits its use, as the poorest in society are as unlikely to own a smartphone as they are a bank account.

SWEDEN: THE E-KRONA

The e-krona is in its second pilot stage, with the final launch expected within five years. In the first pilot phase, the e-krona was token-based and interest bearing, but commentators expect the final version to not be interest bearing after the Riksbank has expressed doubts that negative interest rates could be applied to it. Sweden has among the lowest levels of cash usage in the world and among the fastest growth in mobile payments. Financial inclusion is very high, so the motivation for the CBDC is to provide public access to the central bank balance sheet even if cash usage disappears entirely.

ELSEWHERE

Other major countries and regions are at varying stages of development:

- **Eurozone:** The ECB published a discussion paper⁵ in October 2020 and announced in July 2021 that it would be moving into an investigation phase lasting 24 months, in which it will be addressing “key issues regarding design and distribution”. It seems likely that a formal pilot will follow in mid-2023.
- **US:** The US Federal Reserve published a discussion paper⁶ on money and payments, released in January 2022, which shows that the Fed is in the very early stages of assessing whether a CBDC could be of use – as yet there is no plan to launch one. The discussion paper suggests that a US CBDC would be intermediated to protect the banking sector, while also explicitly mentioning the role that a CBDC could play in protecting the US dollar’s reserve currency status.
- **UK:** The Bank of England (BoE) has indicated that it will work with the Treasury to investigate the need for a UK CBDC, with a consultation to take place in 2022 to determine what would need to be done to develop the necessary technology. The BoE has cautioned, however, that a UK CBDC should not be expected before 2025.

⁵ Source: https://www.ecb.europa.eu/pub/pdf/other/Report_on_a_digital_euro~4d7268b458.en.pdf

⁶ Source: <https://www.federalreserve.gov/publications/files/money-and-payments-20220120.pdf>

DESIGN WILL BE KEY TO SUCCESSFUL IMPLEMENTATION

AS CENTRAL BANKS DESIGN THEIR CBDCS THEY ARE GRAPPLING WITH A NUMBER OF CRITICAL DESIGN QUESTIONS.

- **Who will have access to the CBDC?**

If CBDCs are to be made available to every citizen in a country, the setup and maintenance of such a large number of accounts is challenging. This means there is a question around whether CBDCs should be directly available to all, or only on a wholesale basis to improve settlement and security of interbank transactions. Our expectation is that CBDCs will be accessible to all citizens, as that is the only way that central banks and governments will be able to fully benefit from their implementation.

- **Will the CBDC holder directly transact with the central bank or will they need to use an intermediary?**

Although we would expect central banks to be the only entity able to issue and redeem CBDCs, it is possible that commercial banks may act as intermediaries between central banks and citizens. This would remove some pressure from the central bank in terms of account maintenance and would allow commercial banks to earn fees for acting in this capacity. In our view these two factors are sufficient to make an intermediated system attractive to many central banks.

- **Will CBDCs be in the form of a token, bearer asset or held in an account?**

Key to this decision is the issue of anonymity. When two people exchange a bank note, ownership is transferred by physical possession and can take place with complete anonymity – a token-based CBDC would have similar characteristics. By contrast, an account-based CBDC could give the central bank complete transparency of all transaction information. This is an area where the optimal solution for central banks may differ to that favoured by many citizens. A perception that transactions were being centrally monitored may well be a factor that slows the adoption of CBDCs.

- **Will CBDCs be interest bearing?**

As already discussed, a non-interest bearing CBDC closely resembles a digital bank note, losing some of the advantages to central banks, but reducing the risk that CBDCs act as competition for commercial bank deposits. In our view the risk of bank disintermediation is likely to outweigh the benefits of more efficient implementation of monetary policy for most central banks, meaning that most CBDCs will not be interest-bearing.

There are other considerations, including how domestic CBDCs can be linked into an international network to facilitate foreign holders or international transactions. This could increase financial stability risks for emerging economies as citizens may choose to hold CBDCs in major currencies rather than local deposits, especially during periods of stress. Programmable CBDCs, with either expiry dates or specific terms of use, would need to be separated from CBDCs that do not bear those characteristics. CBDC holders would also need to have confidence that their holdings could not be subject to retrospective changes.



CONCLUSION

In our view, CBDC development and implementation will be a priority for many central banks in the years ahead. Though the official rationale will likely focus on ensuring financial stability and the promotion of financial inclusion, we suspect the main motivation of central banks is to defend monetary sovereignty, a concern that has undoubtedly been increased by the growing acceptance of cryptocurrencies and stablecoins.

We believe that CBDCs will broadly have the following characteristics:

- Availability to all citizens, not just wholesale to banks
- A two-tiered system, with commercial banks acting as intermediaries
- Non-interest bearing
- Account-based, with the central bank maintaining some visibility over users and flows

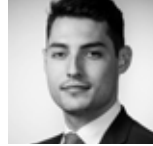
Any deviation from these characteristics could bring significant consequences for how CBDCs are used and their economic impact. Pilot projects will need to be closely monitored for clues about how design decisions are being made and how they are evolving. In particular, the two most developed of the major pilot projects, the e-CNY and e-krona, are likely to provide the best guide to how CBDCs will eventually work. The adoption and use of CBDCs within emerging markets, many of which are at the forefront of development, will also provide useful information, especially with regard to the impact on remittance flows and dollarisation within those economies.

We expect central banks to deliberately limit the potentially negative impact of CBDCs on financial stability, but that the impact on fiscal policy and non-bank lending could be significant. Fiscal policy could become faster and more potent, tailored to specific objectives. In a world that is increasingly reliant on fiscal stimulus, this could be the factor that propels a broad-based adaption of CBDCs.

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