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## **CBDC: Currency or Platform?**

### *Abolishing central bank money for the public*

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#### **Summary**

*Central bank money already has a digital version – bank reserves. Unlike banks, the general public have not been given access to digital money, because central banks have done nothing to modernise banknotes, their main product. Various types of so-called central bank digital currencies (CBDCs) have come under consideration in recent years. Of these, the most brutal solution is provided by the CBDC model as a payment platform on which the private sector could innovate (Bank of England). Another option is the direct model, which offers CBDC for the public without an intermediary. The mixed or hybrid model is a combination of these two. Perhaps the best solution would be **cash-like direct CBDC** in the form of central bank digital notes (CBDNs), which would share most characteristics of banknotes: being issued by a central bank, safety, accessibility, transferability (person-to-person), finality, privacy, independence, and instantaneity. Of course, these notes would be transferred from one person to another digitally, but outside of the global online network, so preventing cyber-attacks on CBDNs in the possession of their holders. They would be a complement to central bank notes, which would remain the guarantee of our money's stable nominal value and the nominal anchor of the economy.*

**Key words:** *central bank digital currency (CBDC), digital reserves, payment platform model, direct model, hybrid model, cash-like direct CBDC, central bank digital note.*

#### **Central bank money for banks and the public**

Central bank money is the money put into circulation by an issuing bank. It comes in two forms: deposit non-cash for banks, usually termed the 'reserve', and cash for the general public, made up of banknotes and, in some countries, coins as well. Unlike with cash, the general public don't have access to central bank deposits, although cash is also physically distributed via commercial banks.

Reserves and cash (which we will call 'banknotes' in this article) were first separated from one another with the development of fractional reserve banking in the UK. The separation was institutionalised by the *Bank Charter Act of 1844*, which split the Bank of England into two departments, the Issue and the Banking Department.<sup>1</sup> The Act also put a stop to the proliferation of banks permitted to issue banknotes; existing banks that did so had to meet requirements which made it difficult for this business to earn a profit. These developments reinforced the dominance

of the Bank of England, which remained the sole banknote-issuing bank in England and Wales by the 1920s. Over time, this single issuing bank model was adopted by most countries, giving rise to the term ‘central bank’.

### **Technological puzzles involving central bank money**

As commercial banks relied on reserves with the central bank, the modernisation of non-cash payments took place in parallel with that of reserves. In short, banks weren’t able to technically innovate interbank payments without also modernising access to reserves and their *clearing and settlement* arrangements. The best example of this is electronic bank money, which could not operate without electronic central bank reserves. The information revolution has brought us digital money, but this hasn’t changed the nature of this technical interdependence. Consequently, banks’ payment services available to the public became increasingly technologically advanced and more competitive.

Unlike reserves, or non-cash money, banknotes did not experience much change.<sup>2</sup> New, non-paper materials were introduced, such as cotton and polymer plastics; durability was enhanced; anti-counterfeiting features were improved; but no *electronic or digital versions of central bank money for the public* were ever developed. The issue was never even raised, as there was consensus amongst central banks that their task was to supply sufficient quantities of banknotes, in other words to meet demand. Forced to compete with increasingly advanced non-cash payment devices (credit and debit cards, ATMs, PoS terminals, e-payments, contactless payments), traditional banknotes inevitably saw their share of the payment market decline. Today, balances in non-cash transaction accounts (also called ‘demand deposits’), which operate as electronic money, exceed the amount of cash in circulation by a factor of between 10 and 20. By way of a reminder, they, taken together, comprise the best-known monetary aggregate – M1.

### **The belated modernisation of central bank money for the public**

For a long time, commercial banks seemed to hold a monopoly on technical advances to non-cash money for the public, whilst central banks stood on the side-lines idly watching their most recognisable product being put out of commission. In recent years, pressure on banknotes has intensified with the entry of non-bank providers into the payment services market. Negative network effects have accelerated the squeeze-out, especially in economically developed countries. Sweden is a textbook example, where almost nobody is willing to take the Riksbank’s krona banknotes anymore, including banks and churches. The Nordic fairy-tale of a cashless society has turned into a grim reality, where the general public are nearly completely dependent on payment intermediators.

Having understood that the unstoppable disappearance of krona banknotes from use would mean the loss of its direct link with the public, the Riksbank was the world’s first central bank to raise the alarm. On one front, it launched a strong initiative in the Swedish Parliament to seek legislative

solutions, and, on the other, it commissioned the e-krona research project, now at the pilot stage (Uruguay's central bank is the only other national bank to have a similar pilot in place). Most other central banks were content to just watch their own banknotes be rejected by a growing number of stakeholders within the country, in spite of formally being *legal tender*.<sup>3</sup> In this context, the first attempt at co-ordinated sharing of experiences between central banks, begun in early 2020, looks more like just a box-ticking exercise than a true call to joint action:

*The Bank of Canada, the Bank of England, the Bank of Japan, the European Central Bank, the Sveriges Riksbank and the Swiss National Bank, together with the Bank of International Settlements (BIS), have created a group to share experiences as they assess the **potential** cases for central bank digital currency (CBDC) in their home jurisdictions. The group will assess CBDC use cases; economic, functional and technical design choices, including cross-border interoperability; and the sharing of knowledge on emerging technologies.*<sup>4</sup>

You'll have probably noticed that this group doesn't include the world's key central bank, the US Federal Reserve System (the Fed). That said, the Fed's absence won't prevent the group from assessing the feasibility of CBDC, nor will it stop the US central bank pursuing its own research. What matters is having final results within a reasonable time.

## **How researchers think CBDCs will turn out**

Many researchers are looking into CBDCs, the hot new topic of the past several years, producing an ever growing and thorough body of literature. It's inspiring to look at the key results of these studies, especially those promoted by groups of central banks, since these allow us to glimpse possible future consensuses.

The most brutal solution is provided by the model of *CBDC as a payment platform*. 'In this model, CBDC would serve as a payment platform on which the private sector could innovate.'<sup>5</sup> In this case, after banknotes, or central bank money for the public, have been squeezed out, the central issuing institution will have lost its fundamental prerogative, direct issuing authority. The remaining power to issue reserves is only indirect, as this deposit-based form of central bank money can be accessed only by banks and authorised payment service providers.

The model doesn't mean that a central bank will manage the payment platform itself: instead, it would do so in partnership with private financial institutions, sometimes as the minority shareholder with a tiny stake in the new venture, as in the case of the Reserve Bank of Australia and NPP Australia Limited.<sup>6</sup> The Australian example was not a CBDC project from the outset, but a not particularly successful response to problems faced by the old national payments system (RBA, *Conclusions Paper*, June 2019).

The second approach is the *direct model*, which provides CDDBC to the public with no intermediary. This model is superior to the platform-based one across the board, providing greater safety, resilience, access, and privacy. However, no central bank has yet expressed its preference for this

model, primarily due to a desire to safeguard the interests of the banking sector and new payment providers, couched in concerns for the financial system's stability.

This 'direct access' ought to be understood as being conditional, even where this feature is highlighted as a benefit: 'The direct CBDC is attractive for its simplicity, as it eliminates dependence on intermediaries by doing away with them.'<sup>7</sup> Households and business don't receive cash directly from the central bank either – they get it through commercial banks. It's truly naïve to imagine a central bank maintaining tens or hundreds of millions of accounts for private individuals and businesses and contacting each of them directly. The technology now available may permit bulk data processing but still does not allow efficient interactive communication with millions of consumers. So, even *direct CBDCs* require intermediation by the banking sector and nearly the whole of the payment industry. The key difference is in the off-balance-sheet recognition of *direct CBDCs* and their independence from payment intermediaries' liquidity. As a side note, it's clear that such a model doesn't need transaction deposit insurance, since these deposits would in effect be claims on the central bank.

There are also two alternative options for the direct model: *cash-like* CBDC, often confused with token-based digital currency, and *account-based* CBDC. The latter entails direct public access to central bank reserves, hitherto available only to banks, as already noted, and recently to payment providers as well. The account-based system is less favourable for households and businesses because it permits nominally negative interest rates to be applied with ease.

The *mixed* or *hybrid model* is a combination of these two approaches in which the central bank keeps its direct link with the public, rather than only with financial institutions, and where new private companies are able to enter the payment market.

The e-krona envisaged by the Swedish Riksbank bears a resemblance to this mixed model. It's being advertised as a complement to cash on the one hand, and, on the other, as a private network: 'An e-krona would offer the general public continued access to central bank money, as cash has done, but in digital form. ... The e-krona network is private and only the Riksbank can approve and add new participants to the network.'<sup>8</sup>

## **Will innovations spell the end of central bank money for the public?**

Introducing a CBDC in any of the forms assessed and tested to date would mean cash would lose some of its key features as money. The biggest change would take place with a *payment platform model*, and the smallest in a *cash-like direct model*. Not even the latter, however, provides *digital cash* for households and businesses.

A complete substitution of banknotes by any form of CBDC would imply the disappearance of a *non-interest nominal asset*, which is authentic central bank money. This scenario would mean the *end of money's genetic code*, shaped by several millennia of evolution. The retirement of nominally stable money would jeopardise the fundamental functions of money as a unit of account

and a measure of value. The consequent volatility of digital money, coupled with the breaking of the direct link between the central bank and the general public, would lead to turbulence in goods and asset prices and general insecurity. It's only to be assumed that no government would like to see this as the outcome of any modernisation of means of payment.

This is why it's crucial to preserve central bank notes as the nominal anchor of the economy and the primary means for keeping its issuer – and the entire banking sector – in check. There's no reason to expect that abolishing cash would remove the danger of a run on the banks, because digital money available 24/7 would maximise clients' ability to withdraw deposits. The inability of digital money to leave the banking sector, meaning to transform from bank money into banknotes, will not prevent systemic risk from erupting in an unimaginably short period of time. We'd no longer see savers queuing outside a latter-day *Northern Rock Bank* to withdraw their deposits: instead, the online interbank network would collapse so quickly that the central bank wouldn't even have time to pump in sufficient reserves.

Digitalisation of the means of payment is not a threat to cash in and of itself: recall that coins and banknotes themselves arose as exceptional technical innovations that incorporated all the features of money. No CBDC substitute possesses all of these hallmarks, and so the only right approach is the one recently announced by the Riksbank, which aims to produce 'an e-krona that can work as complement to cash' (*The Riksbank's e-krona pilot*, February 2020).

## **Central Bank Digital Note (CBDN)**

One question begs an answer right away: aren't *cash-like direct CBDCs* real substitutes to cash? A central bank expert in money digitalisation explains: 'How do we give the general public access to a non-cash financial instrument that is as safe and liquid as cash and which provides a similar degree of privacy, finality and instantaneity? That is the key question of CBDC. No one has the solution yet.'<sup>9</sup>

The Bank of Canada, at the forefront of CBDC research, holds a similar view of what the attributes of *cash-like CBDCs* may be: 'The technology would need to enable person-to-person transfers with immediate settlement, offer a great deal of privacy (not anonymity), have very high resilience in the event of infrastructure failure and be universally accessible.'<sup>10</sup>

Nevertheless, exception could be taken with the Canadian central bank's approach in which a CBDC would be issued only in response to possible threats posed by private digital currencies to the Canadian dollar and *Canada's monetary sovereignty*. 'The Bank of Canada will consider issuing a CBDC if private digital currencies appear as if they will begin to materially erode the public good benefits of the Canadian dollar.' (*Contingency Planning*, 2020, p. 9). A CBDC should not be a back-up weapon in a future monetary war, but an option that the general public itself

would vote on by either accepting or rejecting it in payment transactions. Of course, only as a complement to the Canadian dollar.

The closest version of a *cash-like direct CBDC* could be provided by central bank digital notes (CBDNs), which would have most of the characteristics of banknotes – being issued by a central bank, safety, accessibility, transferability (person-to-person), finality, privacy, independence, and instantaneity. Of course, these notes would be transferred from one person to another digitally, but outside of the global online network, so preventing cyber-attacks on CBDNs in the possession of their holders. They would be a complement to central bank notes, which would remain the guarantee of our money’s stable nominal value and the nominal anchor of the economy.

### *DEMAND CENTRAL BANK DIGITAL NOTES*

### ***KEEP YOUR DIGITAL MONEY IN YOUR HANDS***

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<sup>1</sup> See: V.V. Lepin (2020), Fractional Bank Money, *CBM Research*, Paper 4, April 2020.

<sup>2</sup> Banknotes are often referred to as *paper money*, a name first attested in the 16th century. Yet this term is insufficiently precise, both formally and materially. It is formally so because the original name, *paper credit*, referred to all credit instruments in paper form (promissory notes, bills of exchange, bills and notes, etc., including bank notes, or *Notes payable to the Bearer on Demand, whether issued by a public bank or by a private banker* – Henry Thornton, *Paper Credit of Great Britain (1802)*, Chap. III). The name is materially imprecise because paper has long since been marginalised in banknote production.

<sup>3</sup> See: V.V. Lepin (2020), How Money Disappears, *CBM Research*, Paper 1, April 2020.

<sup>4</sup> BIS (2020), Central bank group to assess potential cases for central bank digital currencies, *Press release*, Bank for international settlements, 21 January 2020.

<sup>5</sup> Bank of England (2020), Central Bank Digital Currency: Opportunities, challenges and design, Discussion Paper, March 2020.

<sup>6</sup> ‘The New Payments Platform (NPP), launched in February 2018, is a fast retail payment system developed by a consortium of 13 financial institutions, including the Reserve Bank. ... Currently there are 4 high-band shareholders (the major banks), 7 medium-band shareholders (including the RBA), and 2 low-band shareholders.’ RBA (2019), NPP Functionality and Access Consultation: *Conclusions Paper*, Reserve Bank of Australia, June 2019, p. 1, 25.

<sup>7</sup> Raphael Auer and Rainer Bohme (2020), The technology of retail central bank digital currency, *BIS Quarterly Review*, March 2020, p. 90.

<sup>8</sup> Sveriges Riksbank (2020), The Riksbank’s e-krona pilot, February 2020.

<sup>9</sup> Aleksi Grym, Head of Digitalization at Bank of Finland (2020), Getting Real about CBDC, *Cash Essentials*, February 23, 2020.

<sup>10</sup> Bank of Canada (2020), Contingency Planning for a Central Bank Digital Currency, February 25, 2020.