1 What are central bank digital currencies?

The Bank of England describes central bank digital currencies (CBDCs) as “an electronic form of central bank money that could be widely used by households and businesses to make payments and store value”. The International Monetary Fund (IMF) describes them as a new form of money with three particular characteristics:  

- They are in a digital/electronic form  
- They are issued by a country’s central bank (in the UK, this is the Bank of England.)  
- They are intended to serve as legal tender

The money that we as consumers and businesses currently use in the UK does not meet all three of these conditions.

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Banknotes are issued by the central bank and are legal tender, but they are clearly not in digital format. The opposite is true of electronic bank deposits: while digital, they are not issued by the central bank and don’t technically count as legal tender (largely because ‘legal tender’ has a narrow technical definition which, according to the Bank of England itself, “has no use in everyday life”\(^4\)). In other words, while banknotes are liabilities of the central bank, bank deposits are liabilities of the commercial bank. This means that a consumer’s deposits at a commercial bank are not without credit risk:

... A customer needing to make a payment relies on their bank to have sufficient assets to enable a cash withdrawal or enable settlement with another bank. An insolvent bank with insufficient assets will not be able to honour such commitments. In order to minimise these risks, household deposits up to an amount of £85,000 are protected under the Financial Services Compensation Scheme (FSCS). But large deposits in excess of this amount are not insured and subject to credit risk.\(^5\)

CBDCs are therefore sometimes thought of as a ‘digital banknote’ – an electronic form of money that is directly backed by the central bank. In the UK, like banknotes, a CBDC would be denominated in pounds sterling, so £10 of CBDC would always be equivalent to a £10 banknote.

**UK financial institutions already use digital central bank money**

Commercial banks and certain other financial institutions can already hold electronic money in the form of central bank reserves. Banks use them to pay each other. They are central bank liabilities and risk-free.

A CBDC would make central bank money accessible to consumers and businesses too.

**How do CBDCs differ from cryptocurrencies?**

As explained in our briefing paper [Cryptocurrencies: Bitcoin and other exchange tokens](#), cryptocurrencies use a digital means of financial exchange that relies on algorithms and cryptographic techniques. They use distributed ledger technology (most often in the form of ‘blockchain’) to verify transactions.

Whereas CBDCs are under the authority of the central bank, almost all cryptocurrencies are ‘decentralised’. This means that they are not controlled or managed by any central authority. Cryptocurrencies are also very unlikely to be backed by real assets so their value can fluctuate in comparison to

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\(^5\) Ibid.
traditional fiat currencies. An exception to this is a group of digital currencies called ‘stablecoins’, which are at least partially backed by real assets. Diem – a digital currency proposed by a consortium led by Facebook – is the best-known example.

If the UK were to introduce a CBDC, £10 of CBDC would always be equal to £10 of banknotes or bank deposits. Unlike cryptocurrencies, the CBDC would be backed by the Bank of England.

CBDCs might however adopt some of the technological innovations used by cryptocurrencies.

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6 For this reason, regulators in the UK see them as more akin to unregulated investments than to currencies and prefer to call them ‘crypto-assets’ or ‘exchange tokens’. See, for example: HM Treasury, FCA, Bank of England, Cryptoassets Taskforce: final report, 2018.
7 Diem, The Diem Association (accessed 7 April 2021)
2 How would a CBDC work?

A proposed ‘platform’ model

The Bank of England has proposed a ‘platform’ model for how a CBDC might work in practice, as outlined in Box 1. At the centre of such a system is the central bank’s core ledger, which records all transactions and provides very basic payment functionality. But in this model, consumers would manage their account and make payments through a ‘payment interface provider’ (PIP) – which would work something like bank accounts as we know them today. The important distinction is that PIPs do not store the CBDC. They are simply a technological interface for the customer to view and manage their money.

Box 1: The Bank of England’s proposed platform model for CBDCs

Only regulated PIPs would have access to the central ledger (via secure application programming interfaces – or APIs). PIPs would:

- Provide user-friendly interfaces for customers
- Carry out know-your-customer and money laundering checks
- Set up individual accounts for users in the central register – but in such a way as to protect the customer’s identity
- Authenticate transactions to protect users from fraud

• Develop further services for customers, such as offering new ways for businesses to receive money or the ability to make ‘micropayments’ for very small amounts

The model envisages a mixed public and private sector approach.

**Would consumers have to switch to CBDC?**

In the Bank of England’s vision “any CBDC would be introduced alongside – rather than replacing – cash and bank deposits”. The Bank has stated its commitment to retaining cash for those who need it. It also recognises that widespread transfers from bank deposits to CBDC could potentially undermine the stability of commercial banks and lead to a shortage of credit. So any transition would have to be relatively gradual and carefully managed.

In the longer term, however, it is possible that we might see a shift away from bank deposits (and cash) towards the CBDC. This largely depends on demand from consumers and whether they think the benefits outweigh any costs of making the switch. Such factors as charges for PIP services and the availability of interest would be likely to affect consumer attitudes.

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3 The benefits and risks of CBDCs

3.1 Potential benefits

- **Mitigating risks of new types of private money** – In 2018, the Bank of England’s Financial Policy Committee concluded that crypto-assets did not “currently” threaten financial stability. In 2020, the Bank cautioned that stablecoins might be unable to provide “stability of value” and “may also not be interoperable with each other and with other payment systems, creating closed loops and inefficiencies”.

- **Supporting innovation in the payment system** – The Bank of England lists a range of potential benefits:
  - ‘Programmable money’ that enables transactions to occur according to certain conditions, rules or events
  - Automatic routing of tax payments to tax authorities at point of sale
  - Allowing the government to make direct transfers to individuals
  - Shares that automatically pay dividends directly to shareholders
  - Electricity meters paying suppliers directly based on power usage
  - Making ‘micropayments’ at much lower costs – which might lead to further innovations, such as paying a few pence rather than a subscription to read an online newspaper article.

- **Addressing the consequences of a decline in use of cash** – While the Bank of England is committed to meeting the demand for cash as long as it is needed, it argues that a (well-designed) CBDC could help to retain some of the beneficial characteristics of cash that current electronic bank deposits don’t. A CBDC might focus more on promoting privacy or support financial inclusion.

- **Better cross-border payments systems** – Central banks could work together to link CBDCs and so speed up cross-border payments.

- **More effective transmission of monetary policy** – Changes in the Bank of England’s base rate could be passed on to consumers more quickly and more fully than they are currently. This would however depend on various factors, including whether or not the CBDC is interest-earning.

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12 Ibid.
3.2 Possible challenges

- **Disintermediation – reducing the banking sector’s balance sheet** – When someone converts bank deposits to CBDC, they reduce the size of the commercial bank’s balance sheet – as shown in Box 2. This process of disintermediation is an inevitable consequence of introducing a CBDC, although the extent of the effect depends on uptake of the new digital currency. If banks’ balance sheets were to reduce too much and too quickly, they might need to seek funding from elsewhere, potentially pushing up the cost of their lending to businesses and consumers. This implies a need for careful management of the process.

**Box 2: What happens to bank balance sheets when someone converts bank deposits to CBDC**

- “The household tells its bank to make a £10 payment from its deposit account to its CBDC account (in effect, ‘withdrawing’ CBDC just like with cash).
- “The bank debits (reduces the value of) the household’s account by £10.
- “The bank tells the central bank to transfer £10 from its reserves account to the household’s CBDC account.
- “The central bank debits (reduces the value of) the bank’s reserves account, and credits (increases the value of) the household’s CBDC account, by £10.
- “The composition of the household’s assets changes, because it now holds £10 less in deposits and £10 more in CBDC. But there is no change in the overall size of the household’s balance sheet.
- “The composition of the central bank’s liabilities changes: it now has £10 less in reserve liabilities and £10 more in CBDC liabilities. But there is no immediate change in the size of the central bank’s balance sheet.
- “However, the commercial bank has lost both £10 of reserves (an asset) and £10 of deposits (a liability). Its balance sheet has contracted by £10.”

• **Risk of bank runs** – Further to the risks associated with disintermediation, the advent of a CBDC could potentially make it easier for runs on the banking system to occur. At the moment, such factors as the difficulty of storing large amounts of cash limit such risks. A CBDC would remove many of those limits.

• **Offline usage** – The CBDC payment system would probably require a connection to the central ledger, which may not always be available. While it might still be possible to initiate a payment, currently such a workaround would depend on the receiver’s trust in the sender to have sufficient funds. There is also a risk of someone attempting to spend the same money twice.

• **Cyber attack** – The Bank for International Settlements (BIS) warns that a successful attack on a CBDC system could quickly threaten many users, as well as their faith in the system: “Defending against cyber attacks will be made more difficult as the number of endpoints in a general purpose CBDC system will be significantly larger than those of current wholesale central bank systems.” 14 This would make a CBDC system a critical piece of national infrastructure.

• **Data privacy** – The UK is likely to rule out a fully anonymous CBDC due to the need to comply with know-your-customer and anti-money laundering checks. This means that unlike cash, a CBDC would inevitably allow more tracking and less anonymity. BIS suggests that “a key national policy question will be deciding who can access which parts of [this data] and under what circumstances”. 15

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15 Ibid.
4 Plans to develop CBDCs

Countries across the world are considering whether the benefits of CBDCs are worth the potential risks. In 2019, BIS reported:

At this stage, most central banks appear to have clarified the challenges of launching a CBDC but they are not yet convinced that the benefits will outweigh the costs. Those that do see clear benefits are predominantly from [emerging market economy] jurisdictions. From survey responses, this seems to be because financial inclusion projects create a clear mandate for central bank action, and a lack of current infrastructure limits the disruption a CBDC could create while simultaneously encouraging the use of new technology. (BIS, 2019)

4.1 UK

In March 2020, the Bank of England published its discussion paper on the potential opportunities and challenges of CBDC and invited feedback from a wide range of stakeholders. In particular, the Bank was keen to better understand: the impact on payments; the impact on monetary policy and financial stability; questions of functionality and the design of CBDC; and the most appropriate technology to use to power a CBDC.

In October 2020, the Bank of England was one of seven central banks to come together with the Bank for International Settlements to publish a report on the “foundational principles” of CBDCs. This report outlines three key principles for CBDCs:

- CBDC should coexist with cash and other types of money in a flexible and innovative payment system.
- Any introduction should support wider policy objectives and do no harm to monetary and financial stability.
- Features should promote innovation and efficiency.

Central Bank Digital Currency Taskforce

The Bank of England and HM Treasury announced the creation of a joint Central Bank Digital Taskforce on 19 April 2021. Emphasising that no decision

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17 The others were: Bank of Canada, Bank of Japan, European Central Bank, Federal Reserve (US), Sveriges Riksbank (Sweden), Swiss National Bank.
has been made about whether to introduce a CBDC, they note that the Taskforce will explore possibilities and promote a “strategic approach”. Specifically, it will:

- Coordinate exploration of the objectives, use cases, opportunities and risks of a potential UK CBDC.
- Guide evaluation of the design features a CBDC must display to achieve our goals.
- Support a rigorous, coherent and comprehensive assessment of the overall case for a UK CBDC.
- Monitor international CBDC developments to ensure the UK remains at the forefront of global innovation.19

4.2 Other countries

CBDCTracker.org – run by Boston Consulting Group to track the development of CBDCs worldwide – reported that by April 2021 over 60 countries had taken steps towards introducing a CBDC for retail purposes.20

Some notable examples include:

- **China** – The People’s Bank of China (PBoC) is introducing a ‘digital yuan’ after piloting the concept with a number of large retailers allowing customers to pay using CBDC. The currency is backed 1:1 with ‘real’ currency by the central bank.
- **European Central Bank** – In 2020, the ECB published a paper on the potential of a ‘digital euro’.21 This was intended to serve as a “starting point for a public consultation” on the matter. In mid-2021, it is expected to announce a decision on whether or not to proceed with further exploration.
- **United States** – The Federal Reserve System is undertaking “research and experimentation” in connection to CBDCs.22 The Federal Reserve Chair described 2021 as “the year in which we engage with the public pretty actively [on CBDC]”.23

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20 The IMF contends that in January 2021 only about 40 central banks were legally able to issue digital currencies. See: IMF, ‘[Legally speaking, is Digital Money Really Money?](https://www.imf.org/external/np/sec/factsheets/fs170.htm)’, January 2021.
22 US Federal Reserve, ‘[Federal Reserve highlights research and experimentation undertaken to enhance its understanding of the opportunities and risks associated with central bank digital currencies](https://www.federalreserve.gov/newsevents/releases/20210813a01.htm)’, [press release, 13 August 2021]
23 Jerome Powell. [Oral testimony before the House Financial Services Committee on 24 February 2021](https://www.federalreserve.gov/newsevents/testimony/powell/20210224a01.htm).
• **Japan** – A consortium of banks, with support from Japan’s central bank and financial regulator, hoped to introduce a retail digital currency, the ‘J Coin’, in time for the 2020 Tokyo Olympics. It is conducting a proof of concept test in Spring 2021.\(^{24}\) The growing prevalence of the Chinese-owned payment system Alibaba among Japanese consumers had contributed to the impetus for the digital currency.

• **The Bahamas** – In October 2020, the Central Bank of the Bahamas began to roll out the ‘Sand Dollar’. The objectives of the project are “to advance more inclusive access to regulated payments and other financial services for under-serviced communities and socio-economic groups; as well as to reduce service delivery costs and increase transactional efficiency for financial services across The Bahamas.”\(^{25}\)

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\(^{25}\) SandDollar. *Why does the Central Bank of The Bahamas think we need this?* [website, accessed April 2021]
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