

Central Bank Digital Currencies

Gaining traction across the world

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Economics - Global

- ◆ As cash usage continues to fall during the COVID-19 pandemic...
- ◆ ...more central banks are signalling interest in a digital alternative
- ◆ Ultimately CBDCs could change the way the financial system works

The world's largest central banks have been relatively cautious previously on the subject of central bank digital currencies (CBDCs), but they suddenly seem to have woken up to the idea. In the past few weeks, there has been a joint report from the BIS and seven major central banks on the foundational principles and core features of CBDCs, Fed Chair Jerome Powell spoke about digital currencies at the IMF meetings, and both the BoJ and the ECB have published large reports on the subject, suggesting a more positive view than we had seen before.

The accelerating decline of cash usage as a result of COVID-19 is making central banks think about how a universally accessible digital payment mechanism could be necessary. Central banks are also looking into the space from the perspectives of financial inclusion and streamlining payments, which, according to estimates from the Kansas Fed, currently carry a cost of 0.5-0.9% of GDP in most countries. This efficiency gain, it is believed, plus the ability to monitor the economy more easily in real time, could help lift growth and make both monetary and fiscal policy easier to implement.

But there are also potential disadvantages – the risk of large-scale digital bank runs, for example, or power outages, or a central bank having to play a much bigger role in the functioning of the economy. These are ideas that have turned many off the idea until now.

The design of CBDCs is now the subject of a large amount of research all over the world, without a consensus on the best way forward. And underneath the design of a CBDC there will be considerations over what qualities this product has. Will it bear interest? Will spending be traceable? Will it work offline? Depending on how these questions are answered, CBDCs could play a huge role in reshaping payments.

Then there are the implications for monetary policy settings. If a CBDC is not interest-bearing, then it could essentially rule out negative interest rates in the future. That's because there would always be a zero-yielding, digital central bank asset available. If the instrument is interest-bearing, then deeply negative ones cannot be ruled out.

With the world's major central banks just now warming to the idea, in other parts of the world, especially Sweden and mainland China, development of CBDCs is further ahead, and likely to be a reality by the end of 2021. The lessons learned in these economies will shape the designs of CBDCs elsewhere. Many projects are also underway in other parts of the world, as we detail later in this report.

This is a redacted version of the report published on 26-Oct-20. Please contact your HSBC representative or email AskResearch@hsbc.com for information.



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Central Bank Digital Currencies

- ◆ As cash payments continue to fall out of fashion...
- ◆ ...central banks are working on developing digital currencies...
- ◆ ...that could have widespread economic implications

So, what are central bank digital currencies?

For many people, the phrase 'digital currency' will make you think of Bitcoin or currencies from within a video game universe. But, as the world moves away from cash at an ever-faster rate, central banks are having to consider whether they need to start developing digital versions of the notes and coins that we have in our wallets. These fit under a broad umbrella – central bank digital currencies (CBDCs).

Why are central banks getting more involved now?

The world's largest central banks have woken up to the idea in recent months, having been relatively cautious on the subject of CBDCs until now.

The leaders, globally, are still Sweden and mainland China, and both could well launch digital currencies before the end of 2021. Their progress, as well as the continuing decline in cash usage, accelerated by COVID-19, is spurring other central banks to look much more closely at the issue. In recent weeks there have been key reports from both the ECB¹ and the BoJ² following closely behind a joint report³ from seven major central banks and the BIS that outlines the foundational principles and core features of CBDCs.

Both the ECB and BoJ appear to be turning more positive on the subject, and the presence of Fed Chair Jerome Powell on a panel on the subject of digital currencies at the recent IMF meetings is also telling. The world's major central banks are clearly taking more interest in the subject.

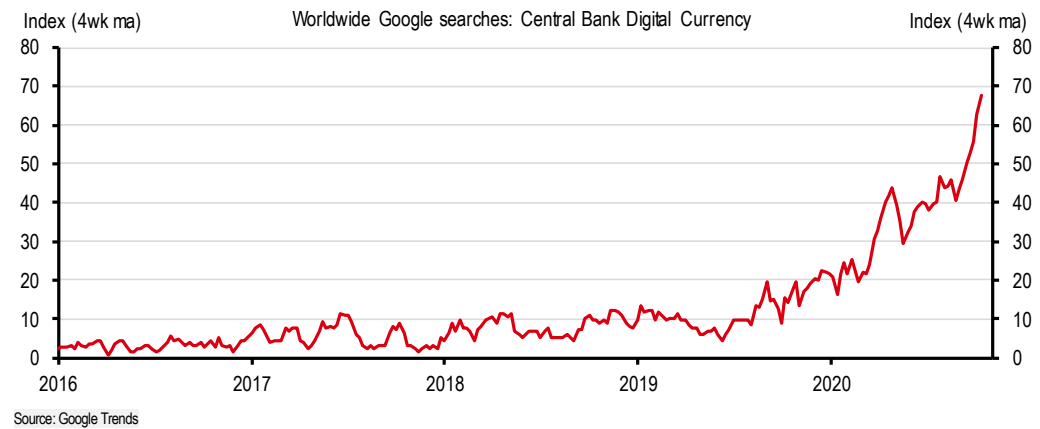
This is a redacted version of the report published on 26-Oct-20. To access the full note, including a review of CBDCs in Sweden and China as well as a summary of other CBDCs projects around the world, please contact your HSBC representative or email AskResearch@hsbc.com

¹ Report on a digital euro, ECB, October 2020

² The Bank of Japan's Approach to Central Bank Digital Currency, October 2020

³ Central banks and BIS publish first central bank digital currency (CBDC) report laying out key requirements, BIS, 9 October 2020.

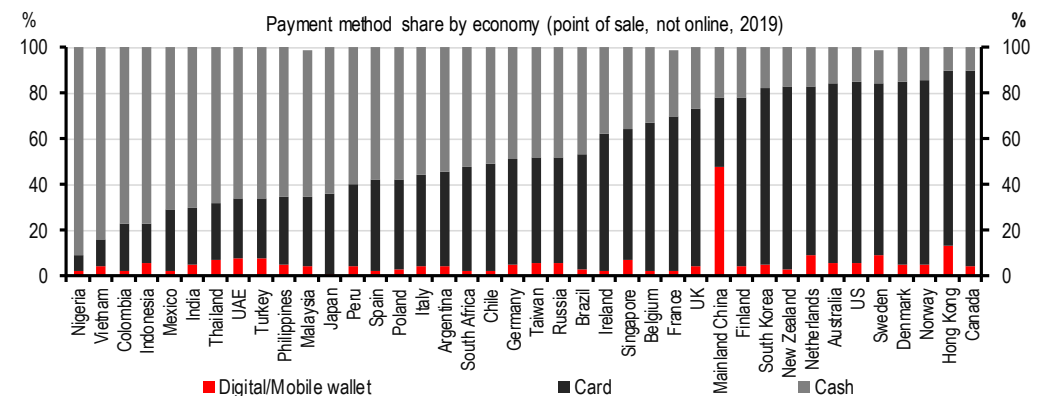
1. Interest in central bank digital currencies has been rising



Why are they needed?

Across the world, cash's share of payments has been in decline for many years. As we have mentioned before, the COVID-19 pandemic has accelerated this move in many parts of the world.

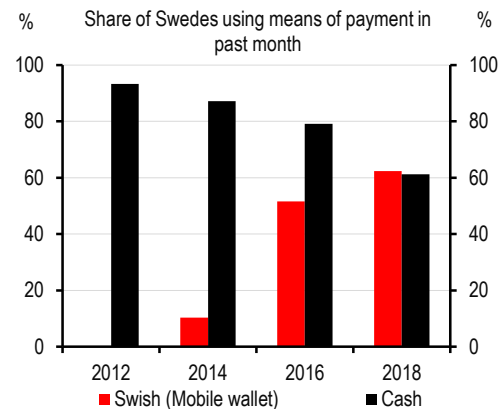
2. The degree of cash usage varies greatly across the world



Source: WorldPay Global Payments report 2020. Note: Individual payment methods actual shares by country and region are calculated using WorldPay's model, which contains a detailed breakdown of payment methods used when shopping online and at point of sale, which were sourced from a variety of data sources including GlobalData's 2019 Consumer Payments Insights Survey, and so may vary from the official data from central banks.

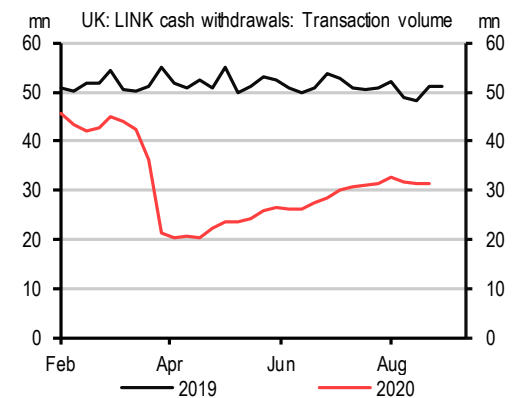
Some countries, famously Sweden, have seen cash payments in steady decline for many years, while the pandemic has caused governments, central banks, businesses and consumers to turn their back on paper money – either by changing their behaviour or amending regulations – due to the fear, for many, of catching COVID-19.

3. Swedes have turned their back on cash quickly...



Source: Riksbank Payment statistics

4. ...and the pandemic has pushed people away from cash withdrawals



Source: LINK

As we outlined in that report, this has acted as an accelerant for the global demise of cash payments. And as cash usage starts to fall, the decline can accelerate quickly, as businesses stop accepting cash payments due to the relatively high fixed costs of taking them.

That means that many central banks around the world will be starting to think about digital currencies in the coming years, asking themselves if paper money achieves a basic role of a central bank: **to provide a universally accepted and universally accessible means of payment**. On top of this, the BIS⁴ shows that in the developed world central banks are researching CBDCs to promote the safety and robustness of the payments system, or domestic payments efficiency, while for emerging market economies financial inclusion is an important motivation.

As well as the developments on the consumer behaviour front, there have been enormous leaps on the technological front in recent years. The arrival of Bitcoin and other cryptocurrencies into the relative mainstream has created a digital payments competitor as well as helping to develop the underlying technology needed to operate a CBDC.

All of this together is pushing the world towards the idea of central bank issued digital currency, and interest is building in the subject.

What actually is a CBDC and how does it work?

At the very simplest level, a CBDC is a currency issued by a central bank, but only in digital form, rather than notes and coins. The Atlantic Council defines them as:

“A country’s fiat currency that is also a claim on the central bank. Instead of printing money, the central bank issues electronic coins or account backed by the full faith and credit of the government.

The Atlantic Council definition of a CBDC

⁴ Boar, C, H Holden and A Wadsworth (2020): “Impending arrival: a sequel to the survey on central bank digital currency”, BIS Papers, no 107, January.

On the simplest basis, a CBDC will provide a form of digital payment that is a claim on the central bank, and is available to all and accepted by all. A CBDC could replace paper notes and coins, but it seems likely that it will operate alongside them as a digital alternative. There are a number of considerations when thinking about the design of a CBDC that central banks need to mull over.

There currently isn't a broad consensus on which approach is best, but the implications of a CBDC are largely the same, regardless of the underlying product design. For the sake of clarity, there can be wholesale and retail CBDCs. In this report we are discussing retail ones that would be available to the general public, rather than wholesale CBDCs for financial institutions that hold reserve deposits with a central bank.

The technical details. For any interested readers, the BIS Quarterly Review in March 2020⁵ has an excellent summary of the technical considerations that a central bank needs to make when thinking about designing a digital currency.

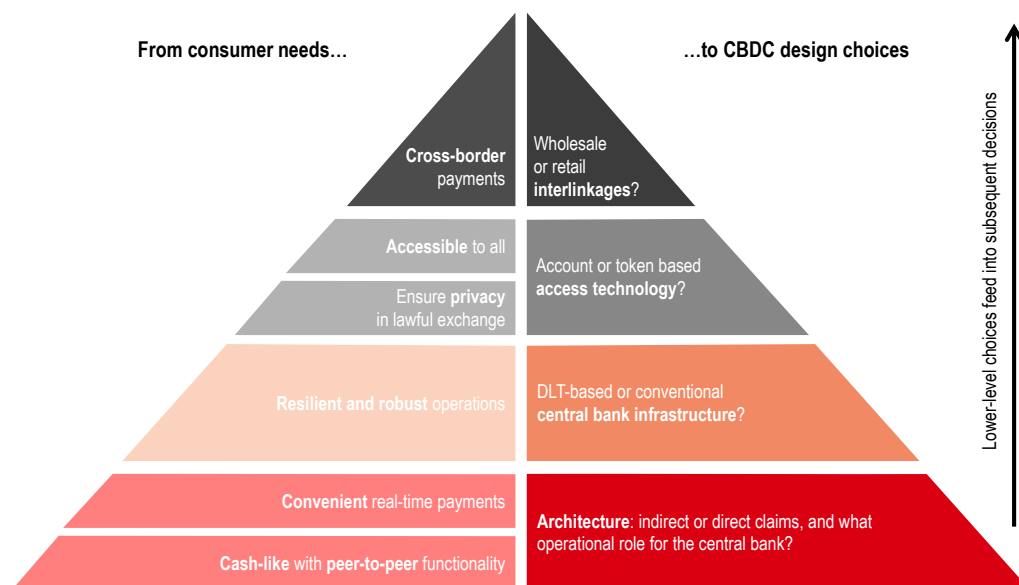
There are four main considerations:

- ◆ **Architecture:** Would we have an indirect CBDC, which went through intermediaries such as commercial bank networks, or a direct CBDC, which is essentially digital banknotes and companies and consumers would have a direct account with the central bank?
- ◆ **Infrastructure:** Would any token be centralised or use distributed ledger technology (DLT)? Here, the consideration is between whether all transactions need to be approved by the network (DLT) or one central source (the central bank). DLT appears to be difficult at this juncture due to technological limitations over the processing speeds and volumes of the technology. See *Distributed ledger technology in payment, clearing and settlement: An analytical framework*, BIS, February 2017 for more information on the technology at play here.
- ◆ **Token or account-based?** In an account-based CBDC, ownership is tied to an identity, and transactions are authorised via identification. CBDCs based on digital tokens rely on demonstrated knowledge, such as a digital signature.
- ◆ **National or international?** The design of a CBDC will depend on whether it needs to be used only for domestic payments or cross-border ones too.

In the case of an indirect CBDC, there wouldn't be a noticeable difference for many people when it comes to payments, but the underlying infrastructure would be quite different. However, if we were to see the implementation of a direct CBDC, the ability to hold an account direct with the central bank would become more noticeable.

⁵ The technology of retail central bank digital currency, BIS Quarterly Review, March 2020

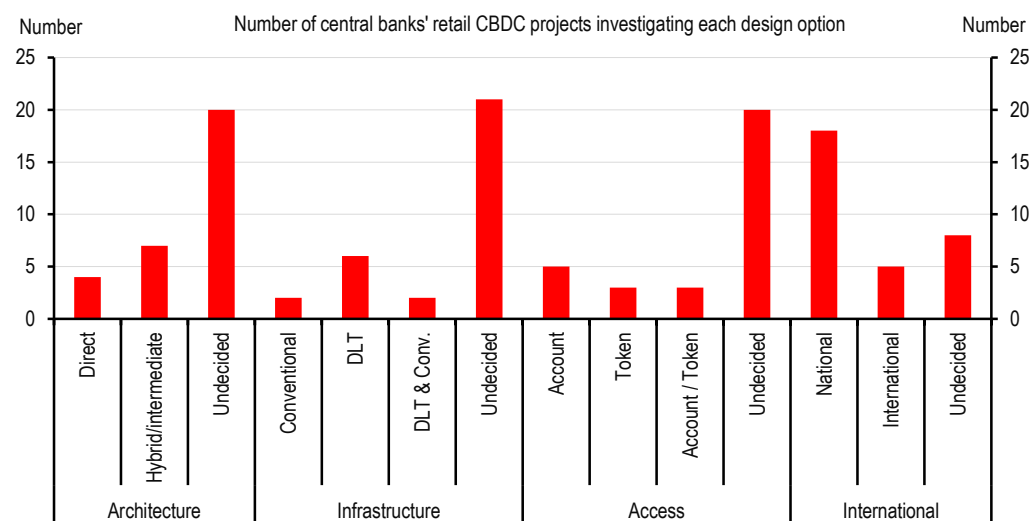
5. The decisions to be made when building a CBDC



Source: The technology of retail central bank digital currency, BIS Quarterly Review, March 2020

Most of the early studies in the space, including pilots, have opted to use an intermediate architecture, focus on national payments and are undecided over whether any token would be centralised or use DLT and again undecided over whether to use tokens or accounts. The ongoing results of pilots across the world will inevitably lead to decisions on these uncertain topics – and is one of the biggest subtopics of CBDCs that will need to be ironed out in the coming months and years.

6. Of those undertaking CBDC projects, there is a lot of uncertainty



Source: Auer, R, G Cornelli and J Frost (2020), "Rise of the central bank digital currencies: drivers, approaches and technologies", BIS working paper, No 880, August

OK, that's how it's made. But what does it do?

The nature of the CBDC is crucial. The design is one thing, but the qualities that the product have are just as important. The nature of such a product and the qualities it has (as outlined in table 7) will have widespread implications for the future of monetary policy and could alter the

way we think about cash from being a physical asset to an electronic one. Even if a token or an account option is chosen, central banks have a separate decision to make about whether a CBDC should be interest-bearing or not, whether to allow peer-to-peer transfer (without money going in and out of the central bank's 'account'), or to allow anonymity. These are all considerations to be made, and if a token is used, there are more issues to be considered than by using an accounts approach.

7. Different possibilities for central bank money

Quality	Existing Central Bank money		Central Bank digital currencies		
	Cash	Reserves and settlement balances	General purpose		Wholesale only token
			Token	Accounts	
24/7 availability	✓	✗	✓	(✓)	(✓)
Anonymity vis-à-vis central bank	✓	✗	(✓)	✗	(✓)
Peer-to-peer transfer	✓	✗	(✓)	✗	(✓)
Interest-bearing	✗	(✓)	(✓)	(✓)	(✓)
Limits or caps	✗	✗	(✓)	(✓)	(✓)

Source: BIS. Note: ✓ = existing or likely feature, (✓) = possible feature, ✗ = not typical or possible feature.

Seven central banks, The Bank of Canada, the Bank of England, the Bank of Japan, the European Central Bank, the Federal Reserve, Sweden's Riksbank, the Swiss National Bank and the BIS, have worked together to collate a set of principles for a CBDC. The report⁶, released on 9 October 2020, entitled *Central bank digital currencies: foundational principles and core features*, suggests some main features and principles:

- ◆ Coexistence 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.
- ◆ Resilient and secure to maintain operational integrity.
- ◆ Convenient and available at very low or no cost to end users.
- ◆ Underpinned by appropriate standards and a clear legal framework.
- ◆ Have an appropriate role for the private sector, as well as promoting competition and innovation.

The report suggests that this combination of features provides a starting point when thinking about CBDCs, although the exact specifications will vary depending on national priorities.

“ A design that delivers these features can promote more resilient, efficient, inclusive and innovative payments. Although there will be no one “one size fits all” CBDC due to national priorities and circumstances, our report provides a springboard for further development of workable CBDCs

Benoît Cœuré, Head of the BIS Innovation Hub.

⁶ Central banks and BIS publish first central bank digital currency (CBDC) report laying out key requirements, BIS, 9 October 2020.

What could the impact be?

Given that CBDCs could be some way away in major economies, it might be easy to wonder why they are gaining traction and why they are worth caring about. The answer is simply that the economic implications could be enormous – and largely positive. These implications are merely scratching the surface of some of the result of introducing CBDCs, and more detail will likely emerge as more work is conducted in the space.

Raising financial inclusion

According to the BIS⁷, many emerging market central banks are interested in exploring a CBDC for financial inclusion purposes. Globally, 1.7bn people remain unbanked according to the latest Global Findex Database from the World Bank, while even in the developed world, many are also underbanked – in the US, for example, around 14m people are unbanked and 50m are underbanked – unable to access the full range of financial services despite having a bank account.

In the emerging world, as mobile money accounts are becoming increasingly popular, retail CBDC accounts could also be incorporated into mobile wallets. If launched alongside other programmes/campaigns to help with tackling digital connectivity, a CBDC can help people to have easy access to a bank account, rapidly increasing the number of digitally connected people in the world.

Cutting transaction costs

One of the biggest potential benefits to the economy from a CBDC is the frictionless and (effectively) costless nature of digital transactions. This helps to save on wastage in the same way as shifting from cash to digital transactions. A paper from the Kansas Fed⁸ suggests that retail payment costs are estimated to absorb 0.5-0.9% of annual economic output in many countries. This doesn't just provide an efficiency gain directly, but it can also unlock those funds to be spent on more productive endeavours by firms, possibly supporting investment or hiring.

0.5-0.9% of GDP

Absorbed in retail payment costs each year

In the emerging world, remittances are the largest source of external financing in many countries (such as the Philippines and Mexico), despite the high costs charged by banks and post offices. CBDCs could create a domestic and cross-border payments system that is more affordable, as well as fast and efficient, meaning more money goes back rather than being lost in conversion costs.

Monetary policy could be more efficient

A lot of the impact on monetary policy will depend on the decisions made by central banks in the design of a CBDC, most notably whether the instrument is interest-bearing or not.

If it isn't, and a central bank opts to replicate paper money in as many qualities as possible, then a CBDC would yield 0% at all times. This, in practice, would make it very hard for a central bank to cut its policy rate below zero – as there would always be a zero-yielding, digital central bank

⁸ Measuring the Costs of Retail Payment Methods, Fumiko Hayashi and William R. Keeton, Federal Reserve Bank of Kansas City

asset available. This consideration, we believe, was a large part of the reason behind Sweden's Riksbank's decision to raise its policy rate back to zero in December 2019. Essentially, a non-interest bearing CBDC would make negative policy rates unworkable without some form of cap on the amount of money that could be held within a CBDC account.

If it is interest-bearing, then central banks would have many more options available to them – as the CBDC's interest rate would become the de facto monetary policy instrument. The transmission of monetary policy would therefore be extremely efficient, as a change in monetary policy would feed through immediately and fully into the whole economy as long as cash is wiped out entirely. This would also allow central banks to use negative policy rates if they wanted to – possibly even quite deeply negative. In such a scenario, we could see demand for physical safe assets, such as gold, rise.

In either scenario, transaction data from CBDCs would allow central banks and governments the ability to monitor the economy in real time and therefore better determine the appropriate policy setting. While on the face of it, this presents a number of challenges surrounding privacy – the design of a CBDC can be adjusted accordingly to mean that transactions are anonymous in terms of the payer and payee but substantial amounts of useful data could still be gathered from the live ticker of the volume of transactions within the economy.

In an extreme example, a central bank could simply set the interest rate on the CBDC to be rule-based⁹, based on the information gained from transaction data. While this is unlikely given the risks of extreme policy rate moves and a lack of certainty for borrowers and savers, the data could be used to make more informed policy decisions.

In terms of balance sheets, if there is high demand for CBDC, then the central bank's balance sheet could grow significantly. On top of this, if commercial banks were to see rapid deposit withdrawals then the central bank may have to provide liquidity, which could open the door to accusations of political influence unless this support was provided equally to all banks.

Fiscal transfers

The ability to track the economy in real time is not just useful for central banks, it is also very useful when thinking about how to set fiscal policy within the economy.

On top of this, CBDCs would allow central banks to make direct transfers to people and businesses in times of crisis. The COVID-19 pandemic has shown how useful a policy this could turn out to be, meaning that payments could be made instantaneously, rather than waiting months for cheques to be posted out or arranged through the commercial banking system.

A CBDC can also help to tackle some of the inequality challenges that come with these payments. In the US in 2020, due to some people not having bank accounts, cheques sent out as part of the stimulus packages could not be easily banked. They instead had to incur a charge to cash the cheques, meaning that the poorest in society get less of the stimulus than the rich: clearly not as designed. This phenomenon meant that calls for a "digital dollar" rose, with some suggesting that not only would this help the unbanked in society but also could help to speed up the payments of similar sorts of stimulus in the future¹⁰.

Banks

One of the biggest questions surrounds the current banking system. While an alternative digital asset could mean that traditional commercial banks would have to compete for funds, this can be achieved by paying a small, positive, interest rate spread on deposits to attract deposits

⁹ Such as the rules-based approach noted in papers such as Bordo, M. & Levin, A., Central bank digital currency and the future of monetary policy, NBER Working Paper 23711

¹⁰ Let's Pay the Stimulus in Digital Dollars: Federal Reserve accounts would make the financial system better, stronger and more inclusive. Bloomberg, 24 March 2020.

compared to simply leaving money in the CBDC. As the IMF says¹¹, banks might feel under pressure to raise deposit rates or access more expensive (and volatile) wholesale funding, weighing on profitability and possibly leading to more expensive or lower provision of credit to the real economy.

But, one risk that is pretty evident is the risk of digital bank runs, if it is very easy to move funds from commercial banks to a CBDC. Faced with a crisis, households have historically shifted their assets towards safer places or government securities (bonds or cash). Currently, such a bank run takes place with a flight to paper money or another form of digital liquid money (at another bank or otherwise), however, a CBDC could allow for “digital runs” towards the central bank with unprecedented speed and scale. Alongside any CBDC there would have to be considerations of any backstops that may need to be put in place for such an event.

Trade and international considerations

Whoever moves first with a CBDC has the opportunity to establish and export norms, setting the global standards for payment systems. This is particularly likely given the fact-finding that various central banks are engaging in to design their own CBDCs.

One question is whether CBDCs could challenge the USD’s role as the global reserve currency¹². In the near future, this may be hard to change, given the various speeds at which a CBDC is likely to be released and demanded across the world. There could be a first-mover advantage for a central bank that is at the forefront of the new settlement technology – this pioneering central bank could play a leading role in setting new international standards.

When it comes to cross-border payments, technology would have to be designed that is compatible with other CBDCs. Some central banks, such as the BoJ and ECB, suggest that their CBDC must satisfy this criteria, while many don’t – and are pursuing a national-only concept. The ECB’s attempt to do this could allow the euro to make up a bigger share of global transactions, as foreigners would be freely able to use the Eurosystem’s monetary base.

What about the other downsides?

On top of the risks around digital bank runs, some parts of society are likely to be opposed from the perspective of greater oversight over their spending behaviours and be fundamentally opposed to the idea of a central bank-backed digital currency. In the same vein, there could be political opposition to the introduction of a CBDC if it was seen as a step towards banning cash or introducing deeper negative rates, particularly in some parts of the world.

Equally, there remains a risk of power shortages or outages that could affect payments. A CBDC can be designed as to work offline, but this may involve many teething problems, particularly in emerging markets or rural areas with less stable internet connections.

Who is at what stage?

CBDCs are gaining traction because of the changes in approach from the largest central banks, but across the world a number of economies have engaged in either pilots or advanced research on the topic of CBDCs.

Of the large economies, the two leaders are Sweden and mainland China, which are furthest ahead in the development of CBDCs. However, a number of interesting pilots in Ukraine, South Korea, Iceland and Thailand, for example, should help to inform future decision-making in other

¹¹ See IMF Deputy Managing Director Tao Zhang’s Keynote Address on Central Bank Digital Currency, March 19, 2020

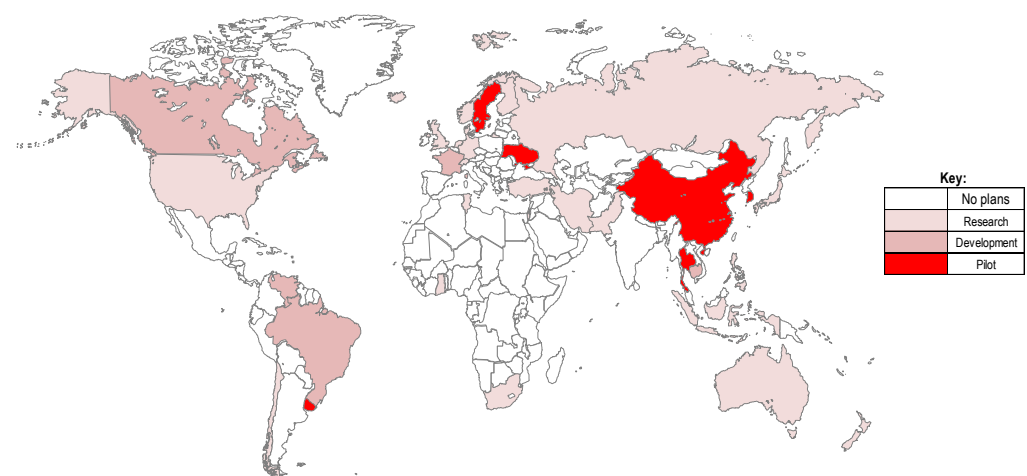
¹² Does a digital euro challenge the dollar’s global dominance?, FT, 20 October 2020

economies. Economies as diverse as Canada, Brazil and Cambodia, amongst others, have started to develop their ideas further.

However, the most developed trial is in the Bahamas, with “Project Sand Dollar”, due to the Sand Dollar being the proposed name of the CBDC. The pilot has been tested on two islands and is being extended to other islands during the rest of 2020. The pilot is card-based, which has limited the speed of its roll-out but could be an interesting story to follow. The latest developments can be followed on Twitter, @sanddollar_BS, for more information.

8. Different economies have taken a different approach to CBDCs

Central Bank Digital Currencies: Status by economy



Source: HSBC, Atlantic Council, BIS

The Fed

Although the Fed has been more cautious than most, recent communication from policymakers does suggest the debate around CBDCs is starting to gain some traction. This includes the involvement of Fed Chair Jerome Powell on a panel on the subject with the IMF on 19 October 2020, where he highlighted the benefits of streamlining the payments system and broadening electronic payments access. This follows a speech¹³ from Governor Lael Brainard, who has been leading the discussion amongst policymakers in the US on this topic, announcing that the Federal Reserve Bank of Boston would collaborate with researchers at the Massachusetts Institute of Technology (MIT) to build and test a hypothetical digital currency oriented to central bank uses. She added that the Fed has not made a decision on whether to undertake such a significant policy process at this time, with the central bank currently more focussed on understanding the implications of CBDCs around the globe.

The ECB

For a long time, the ECB's view on digital currencies has been that if and when a CBDC is needed, the ECB will be ready. This was clearly outlined over the summer in a speech¹⁴ from the ECB's Yves Mersch. However, a recent paper¹⁵, published in October 2020, paints a more optimistic view of digital currencies, saying that “*The possible advantages of a digital euro and*

¹³ <https://www.federalreserve.gov/newsevents/speech/brainard20200813a.htm>

¹⁴ An ECB digital currency – a flight of fancy?, Speech by Yves Mersch, 11 May 2020

¹⁵ Report on a digital euro, ECB, October 2020

the rapid changes in the retail payment landscape imply that the Eurosystem needs to be equipped to issue it in the future.”

Having previously said that there was no concrete “business case” to issue a CBDC, the October 2020 report suggests that this view has changed slightly, implying that if cash usage declines significantly, other electronic payment methods were to become unavailable or foreign digital money was to displace existing means of payment, then a digital euro would be needed. Despite initial caution, the ECB appears to have shifted from more of an ‘if’ to a ‘when’ on the subject. A task force has been set up to examine and continue to investigate the space, mainly from an analytical perspective.

Bank of Japan

The BoJ sees a CBDC as a channel to accelerate the adoption of digital payments in one of the most cash-loving economies in the world.

Having been relatively cautious on the subject at the beginning of the year, based on a speech from Deputy Governor Amamiya Masayoshi in February 2020¹⁶, in August 2020, the central bank’s annual plan included the first reference to digital payments as part of broader government moves to lower the costs of digital payments and discourage cash usage, with a view to streamlining the economy.

This stepped up a gear in October 2020, when the central bank released its paper, *The Bank of Japan’s Approach to Central Bank Digital Currency*, which outlined that while it was not time to release a CBDC today, it was important to prepare for one. The document suggests that a CBDC would be issued indirectly through intermediaries, and would ideally be able to be used for cross-border payments, not just for domestic payments.

The BoJ will develop a test environment and conduct experiments on CBDC as a payment instrument starting in fiscal year 2021. There will be two phases of developing a Proof of Concept (PoC), followed by a pilot if the first two phases are successful.

Bank of England

The BoE has shown more openness towards the idea than other major central banks, but it has recently reiterated that it has not yet made a decision on whether to introduce a digital currency, and that it intends to engage widely on the benefits, risks and practicalities of doing so.

In recent years, the BoE has been a key advocate of central banks exploring the feasibility of a CBDC, having discussed the topic since 2016¹⁷.

The most recent BoE paper¹⁸ on CBDCs, published in March 2020, highlights a number of opportunities that a digital currency could present to help the BoE achieve its objectives of monetary and financial stability. In July, Governor Andrew Bailey said the central bank was still looking at the question of whether they should create a digital currency, and that it will be a very big subject in the future¹⁹. He added that he believes in a few years’ time, the UK will be heading toward some sort of digital currency.

¹⁶ Central Bank Digital Currency and the Future of Payment and Settlement Systems: Remarks at the Future of Payments Forum, 27 February 2020

¹⁷ The-macroeconomics-of-central-bank-issued-digital-currencies, Bank of England, July 2016

¹⁸ Central Bank Digital Currency: opportunities, challenges and design, Bank of England, 12 March 2020

¹⁹ Bank of England Debating Digital Currency Creation, Bailey Says, Bloomberg, 13 July 2020

When could we see the first major central banks launching a CBDC?

According to the BIS²⁰, 10% of central banks say they are likely to issue a general purpose CBDC in the short term, defined as 1-3 years, (twice as many as in 2018) and 20% in the medium term, defined as 1-6 years. While the Bahamas has led the way in terms of implementing a digital currency, the two major central banks looking to implement a CBDC, Sweden's Riksbank and mainland China's PBoC, are readying their proposals. Based on current timelines of research, it seems likely that at least one of these becomes reality by the end of 2021.

However, other central banks appear to be much further behind in the process, and it could be some time before other major central banks make substantial enough progress. But, the flip side of this is that because of the many uncertainties around the design of a CBDC, once one central bank, anywhere in the world, finds a workable solution, many of the headwinds for other central banks would dissipate and we could easily see adoption rates rise very quickly after that.

Summary

Clearly CBDCs carry a lot of potential to transform the way global payments and monetary policy could work. But while in some places, the journey may be much faster, the road to widespread usage of CBDCs across the world could be a long one, with still much work to be done on the design and technology that would underpin them. There are, of course, huge challenges that still need to be addressed, but over the coming years the developments of CBDCs is likely to be one of the most important global economics topics.

Over the next few pages, we outline the developments in Sweden and Mainland China, as well as some of the more advanced programmes at smaller central banks.

^{20,4} Impending arrival – a sequel to the survey on central bank digital currency, BIS, January 2020

Disclosure appendix

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