



Central bank digital currencies: putting a big idea into practice

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Introduction

Thank you very much to Adam Posen and to the Peterson Institute for the invitation to speak here today. It is a pleasure to be here, even if virtually. I am grateful for the role the Peterson Institute has played through the years in promoting both domestic and international policy dialogue.

Central bank digital currencies, or CBDCs, are the topic of my talk today, and indeed the talk of the town. Many central banks are hard at work on research and development. The Central Bank of the Bahamas recently launched its Sand Dollar, and the People's Bank of China is conducting a large-scale pilot of the so-called electronic yuan, or e-CNY. In the United States, the Federal Reserve System is doing extensive research on CBDCs, including work with MIT.

At the Bank for International Settlements (BIS), our new Innovation Hub is complementing this work with multiple projects on CBDCs. We are also conducting research on the economics of CBDCs, and supporting dialogue among central banks through the BIS committees.

And certainly, there is a lively public and academic debate on CBDCs, including in the United States on proposals for a digital dollar.

Yet, once we scratch the surface of this debate, there are fundamental questions. How does a CBDC differ from today's money? What would a CBDC mean for users, central banks, financial institutions and the international monetary system? I will outline how we can put this big idea into practice.

I will argue that CBDCs are a technologically advanced representation of central bank money. If well designed, they could offer a safe, neutral and final means of settlement for the digital economy.

CBDCs appear similar to payment vehicles provided by other infrastructures, such as retail fast payment systems. These systems are being rolled out around the world and make funds available to the payee in real, or near-real, time.² Indeed, retail CBDCs, retail fast payment systems, and supporting 24/7 wholesale payment systems form a continuum of potential improvements to the payment system. However, I will argue that the unique characteristics of central bank money distinguish CBDCs both from commercial bank money and from cryptocurrencies and stablecoins.

¹ I would like to thank Raphael Auer, Jon Frost and Leonardo Gambacorta for support in preparing this speech, and Sarah Bell, Claudio Borio, Stijn Claessens, Emma Claggett, Sebastian Doerr, Krista Hughes, Ross Leckow, Fernando Restoy, Tara Rice, Hyun Song Shin and Takeshi Shirakami for providing comments. I thank Giulio Cornelli, Alexandra End and Ilaria Mattei for research assistance.

² See Committee on Payments and Market Infrastructures (CPMI), *Fast payments – Enhancing the speed and availability of retail payments*, November 2016; and M Bech, J Hancock and W Zhang, "Fast retail payment systems", *BIS Quarterly Review*, March 2020, pp 28–9.



Building on that, I will discuss CBDCs from the user perspective. I will outline the operations involved in a system with CBDCs, and the role of financial institutions.

Finally, I will discuss the possible impact on the international monetary system, where I feel that some clarifications are in order. Contrary to some of the hyperbole around international currency competition, central banks' work on CBDCs is a global collaborative effort.

1. CBDCs and fast payment systems: commonalities and differences

What is a CBDC and how does it compare with other payment options?

A CBDC is a digital payment instrument, denominated in the national unit of account, which is a direct liability of the central bank, like cash. It provides a new, digital form of central bank money – a safe, neutral and ultimate settlement medium that can extinguish all claims in a transaction.³

As you know, today's payment system is a public-private partnership, working in two tiers. On the central bank balance sheet, you have cash and commercial bank deposits at the central bank ("reserves") (Graph 1). The private sector provides commercial bank money, which users can access through bank transfers, cheques, credit and debit cards, and automated teller machines (ATMs).

Public-private partnership of money

Graph 1



Source: BIS elaboration.

Between these two, you have constant clearing on the central bank's balance sheet. Central bank money has several features. First, the central bank offers the ultimate means of settlement, thus helping to extinguish all obligations with finality and eliminating any residual risks involved in making payments. Second, by creating this settlement medium on demand (ie generating intraday settlement liquidity, typically on a collateralised basis), it oils the wheels of the payment system.⁴ Third, in times of stress, it can act as a lender of last resort. These features – finality, intraday liquidity and lender of last resort – are

³ See Group of Central Banks, *Central bank digital currencies: foundational principles and core features*, October 2020.

⁴ See C Borio, "On money, debt, trust and central banking", *BIS Working Papers*, no 763, 2019.

central banks' key contributions to the payment system. They ensure its safety, trustworthiness and operational efficiency.

Another important feature of central bank money is neutrality. As a non-commercial party, the central bank holds a trusted role at the centre of the system.⁵

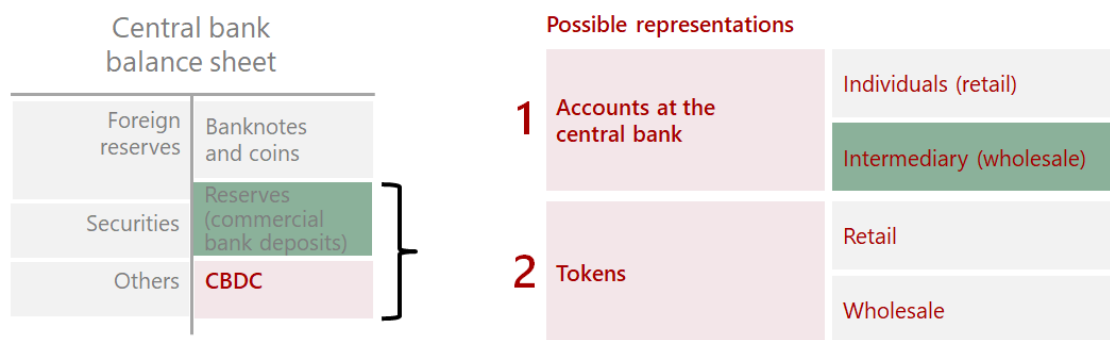
Comparing CBDCs with these existing elements of the payment system, bank reserves can be seen as CBDCs for exclusive use by commercial banks. Financial institutions hold reserves at the central bank and use them for interbank settlement in the payment system. In Graph 2, these are shown in green, as they exist today. Financial institutions use central bank money as the ultimate settlement asset, since payments in central bank money are final and free of credit and liquidity risk. Settlement in central bank money is hence "ultimate", and plays a fundamental role in the financial system.

CBDCs open up possibilities for other new types of central bank money. They can be for wholesale use – just among commercial banks – or retail use, for the general public. In either case, they can be offered through accounts at the central bank, where ownership depends on personal identification, or through cash-like digital tokens, where ownership depends on "holding" the token.


What are CBDCs?

Graph 2

- CBDCs are a new type of central bank liability.



CBDCs are a technologically advanced representation of central bank money.

 Current electronic central bank money

Source: BIS elaboration.

Since commercial banks' reserves are already digitalised, they are, in effect, a form of CBDC. Nowadays, however, central banks are also exploring token-based wholesale CBDCs as a new way for financial institutions to directly access and pay in central bank money. I will not go into this today. But let me just note that the BIS Innovation Hub's Project Helvetia showed it is feasible to integrate tokenised assets and central bank money.⁶

⁵ See Committee on Payment and Settlement Systems (CPSS), *The role of central bank money in payment systems*, August 2003.

⁶ Bank for International Settlements, SIX Group AG and Swiss National Bank, *Project Helvetia: settling tokenised assets in central bank money*, December 2020.



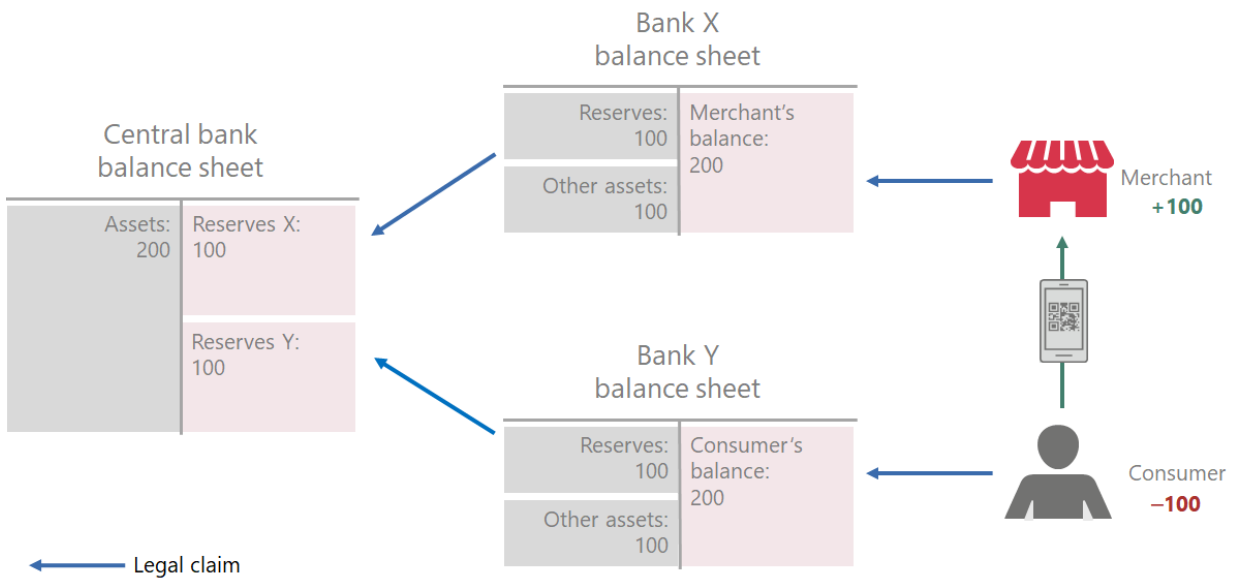
Retail CBDCs grab more attention. These would give the general public a digital means to access central bank money. They could be a new form of “digital cash”, complementing physical cash.

To see what it would mean for consumers and merchants, take the example of a shopper buying \$100 worth of groceries. Compare a retail CBDC payment with a typical transaction today, executed through a fast payments system (FPS) with net settlement in the central bank’s balance sheet.⁷

The customer’s payment provides final funds to the merchant immediately and at any time. Our consumer pays \$100 and it arrives in real time in the shop’s account (Graph 3).⁸

Retail payment is executed in real time

Graph 3



Source: BIS elaboration.

However, settlement between banks on the central bank balance sheet is typically not instantaneous for technological and operational reasons,⁹ even though the transaction between merchant and consumer is cleared instantly. This implies a loan: the merchant’s bank credits its account in real time, while the merchant’s bank has an account payable vis-à-vis the consumer’s bank (Graph 4). In an FPS with deferred settlement, credit exposures between banks accumulate during the delay¹⁰ but exposures are fully collateralised – an institutional safeguard designed or required by the central bank.¹¹

⁷ In practice, FPS may have deferred or real-time settlement; see below.

⁸ Note that the credit exposures between banks arising from deferred settlement are generally covered by collateral.

⁹ For ease of exposition, I refer to “banks” in this speech. But commercial banks are not the only entities offering retail services for electronic payments, which are also offered by electronic money institutions, post office giro institutions and non-bank payment institutions.

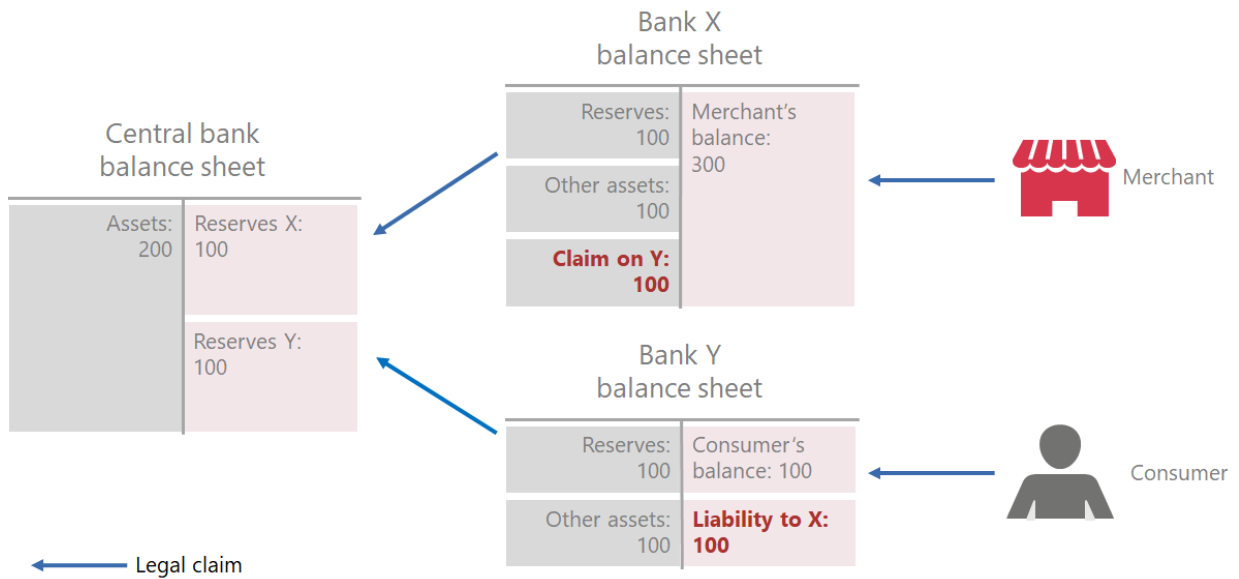
¹⁰ For example, during weekends.

¹¹ See CPMI-IOSCO, *Principles for Financial Market Infrastructures*, April 2012.



Credit risk for payee's PSP results...

Graph 4

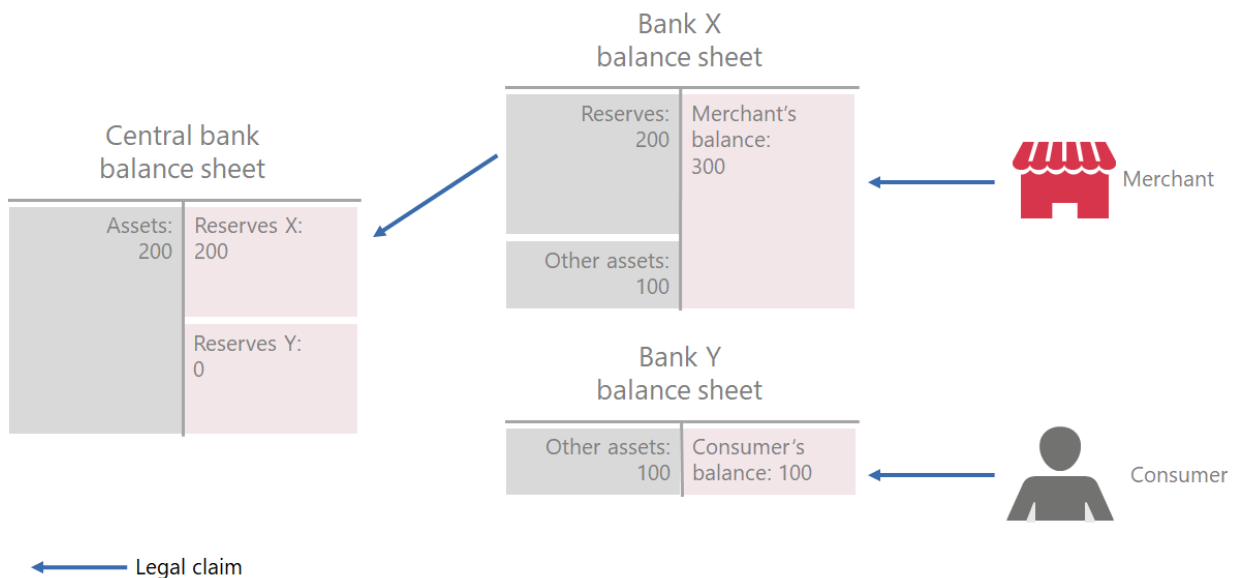


Source: BIS elaboration.

Only once the net of all retail fund transfers is settled on the central bank books are all claims extinguished. There is no further credit or liquidity risk (Graph 5).¹²

...until central bank accounts are settled

Graph 5



Source: BIS elaboration.

¹² Note that deposit insurance does not cover the outstanding credit exposures between banks in the event of default of a bank.

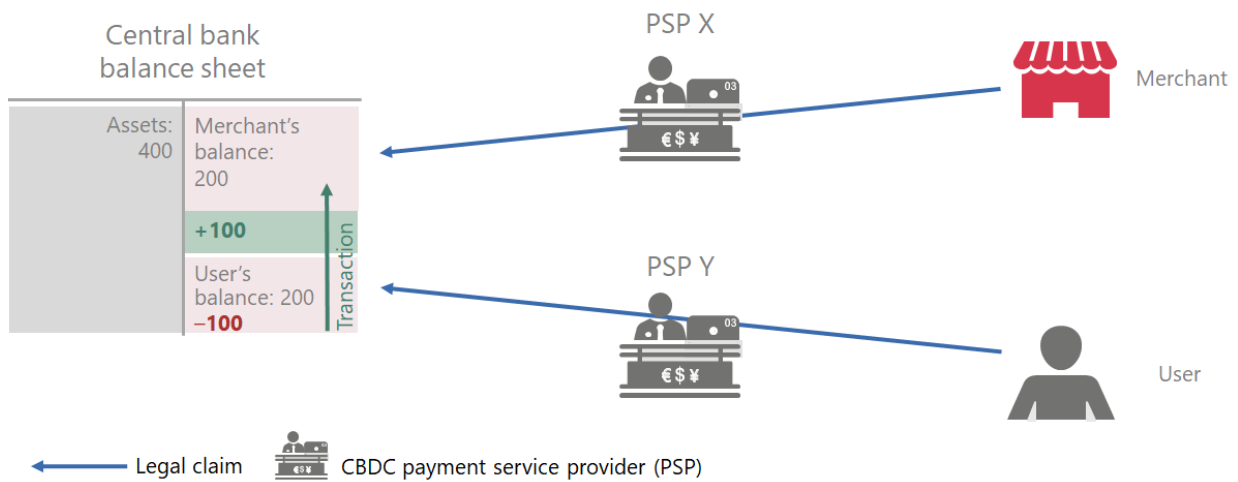


We see that even in commercial bank payment systems, central bank money is essential. Both central bank money and the institutional arrangements of the central bank provide finality and allow the functions of liquidity, credit and lender of last resort. This linking of systems and granting of liquidity and credit makes settlement at different points in time safer.

In contrast, the same transaction in a CBDC-based payment system would be much simpler, as a payment only involves transferring direct claims on the central bank from one user to another (Graph 6.) There is no credit risk: funds are not on the balance sheet of an intermediary, and transactions are settled directly in central bank money, on the central bank's balance sheet, in real time.¹³ Payment is conducted fully in safe and neutral central bank money with immediate finality, without any credit granted between banks in the settlement process. Whether the CBDC is token- or account-based, the principle is the same.

CBDC payments are never subject to any credit risk

Graph 6



Source: BIS elaboration.

CBDC architectures could differ in their operational setup and in how the private and public sectors work together to allow seamless payments.¹⁴ But direct settlement in central bank money is common to all – in fact, this is the quintessential feature of a CBDC-based payment system.¹⁵

Retail CBDCs, retail FPS and supporting 24/7 central bank payment systems (which could, but do not have to, include wholesale CBDCs) are part of a continuum of innovations that central banks are

¹³ Note that the direct settlement in central bank money is the quintessential characteristic of a CBDC-based payment system. Alternative approaches have been suggested that envision private sector payment service providers issuing liabilities fully matched by funds held at the central bank. Such approaches have been labelled "synthetic CBDC", which is a misnomer: as end users would not hold a claim on the central bank, these are not a CBDC by definition (see Group of Central Banks, *Central bank digital currencies: foundational principles and core features*, October 2020).

¹⁴ See R Auer and R Boehme, "The technology of retail central bank digital currency", *BIS Quarterly Review*, March 2020, pp 85-100; and R Auer and R Boehme, "Central bank digital currency: the quest for minimally invasive technology", *BIS Working Papers*, forthcoming. These studies differentiate between three CBDC architectures. "Direct" CBDC architectures are retail payment systems operated by the central bank. "Hybrid" CBDC architectures are intermediate solutions in which private sector intermediaries handle retail payments, but the central bank operates a backup infrastructure. And in "intermediated" CBDC architectures, the private sector operates all retail payment systems while the central bank maintains only a wholesale ledger.

¹⁵ There are other ways to reduce settlement risk as well, such as requiring real-time settlement between banks. This would require 24/7 settlement operations by the central bank. This is sought as part of ongoing wholesale CBDC trials.



currently working on. From the user perspective, these solutions may look very similar (Table 1). What distinguishes a retail FPS from a retail CBDC is that the latter is a central bank liability offering the unique features of central bank money, and this could be a key difference.

Comparison of retail fast payment systems and retail CBDCs Table 1

	Retail FPS	Retail CBDC
Safety (creditworthiness and liquidity as settlement asset)	Liability of commercial banks with deposit insurance, and potentially non-bank payment service providers	Direct CB liability
Finality at end user level	Immediate and (near) real-time; payees can use funds as soon as received.	Immediate and real-time
Finality at wholesale level	Some use deferred settlement for the interbank settlement; others use RTGS.	(No wholesale settlement involved)
Universal accessibility	ID required (account-based) or non-bank wallet (token-based)	ID required (account-based) or general (token-based)
Costs for users and merchants	Generally low; can be regulated	Generally low; can be set by central bank
Anonymity and confidentiality for users	Confidentiality protected by system design, bank secrecy and data protection laws	Confidentiality protected by system design, bank secrecy and data protection laws
New digital functions		Potentially further new functions, including programmability and fractionalisation (ability to make machine-to-machine micro-payments)
Cross-border use	May interlink with other FPSs	May offer advantages, depending on mCBDC design choices

Sources: BIS.

Is this a major issue? Ordinarily it should not be, but it could be in some states of the world.

An individual's decision between a CBDC or commercial bank money will depend primarily on the value added by commercial banks in terms of overall service, and their perceived safety. This is why there is regulation and supervision, and the complex clearing and settlement system provided by the central bank.

Still, in the extreme, history shows that we cannot rule out runs on commercial banks. This already has happened with wholesale central bank money, as when interbank markets froze during the Great Financial Crisis. Central banks resolved this by acting as lender of last resort. CBDCs thus need to strike a balance between reducing the exposure to bank run risk, and the need to enhance competition and improve societies' experience with the payment system. I will come back to this.

Let me note here that cryptocurrencies and stablecoins are not backed by this central bank payment infrastructure, which is a major difference.

2. The user experience with a retail CBDC

If issued, what would CBDCs mean in practice for users?

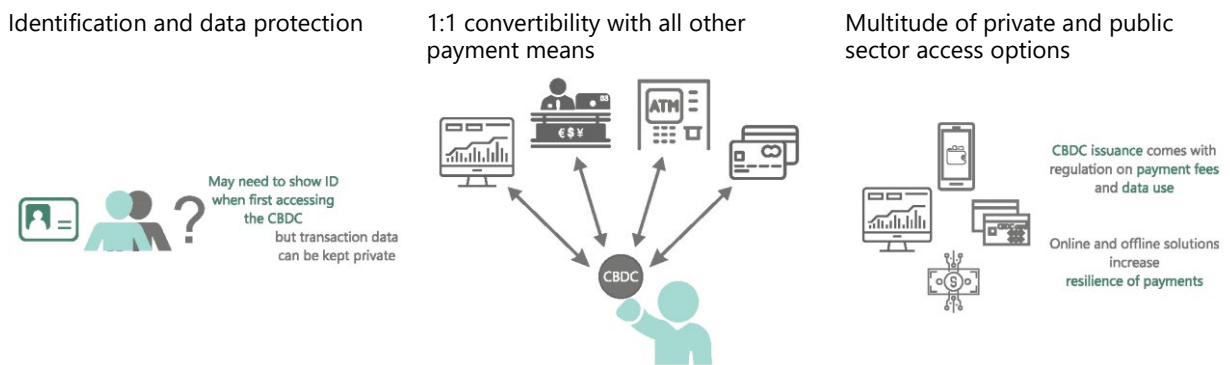
Gaining access to a retail CBDC could look much like any private digital payment option today. A bank or payment service provider would open an account or "wallet" for the user. It would conduct know-your-customer (KYC) checks and ensure compliance with anti-money laundering and financing of

terrorism requirements. It would address cases of payment fraud. This would depend on proper identification and rules on privacy of transaction data (Graph 7, left-hand panel).

Funds could be transferred from a bank account, credit card or other payment service to the CBDC wallet, via largely invisible back-end arrangements. Conversely, the user would need to be able to convert a CBDC at par with any other form of money – funds in a bank account or digital wallets or cash (Graph 7, centre panel).

User experience with a CBDC

Graph 7



Source: R Auer and R Boehme, "Central bank digital currency: the quest for minimally invasive technology", *BIS Working Papers*, forthcoming.

Users would need to be able to pay using a variety of payment devices, such as prepaid CBDC devices or cards with offline capabilities, self-standing smartphone wallets and integration with bank or big tech apps (Graph 7, right-hand panel).¹⁶

Central bank design efforts aim to address both long-standing and emerging issues in payments. For a long time, payments have suffered from high fees for credit cards and cross-border payments, and a lack of universal access to digital payment tools. More recently, weaknesses have emerged in governance frameworks on big tech and other providers' use of transaction data.¹⁷ The broad use of retail CBDCs could create more efficient payment systems and improve the welfare of the general public.

3. The impact on the financial system

It's clear from this discussion that issuing and operating a retail CBDC would involve a very large operational effort – and this would not be up to the central bank alone. The private sector would play a key role, much as in today's two-tier payment system, discussed earlier.

In payments, central banks and commercial banks are joined at the hip. Central banks are not set up to do all the client-facing tasks. And they do not do these today: commercial banks distribute and process cash. With CBDCs, central banks and commercial banks will need to find a balanced arrangement.

¹⁶ Just as is the case with making physical cash available to the entire economy, substantial efforts and collaboration between the private and public sectors is needed to achieve full convertibility of a CBDC. This is yet another reason why central banks are studying a wide array of designs.

¹⁷ See eg F Boissay, T Ehlers, L Gambacorta and H S Shin, "Big techs in finance: on the new nexus between data privacy and competition", *BIS Working Papers*, forthcoming.



We need to grasp the advantages of greater competition through CBDCs, while continuing to ensure the safety and integrity of the financial system.

A recent report by the Group of Central Banks lays out foundational principles for CBDCs, including the monetary Hippocratic Oath (“do no harm”) (Graph 8). Just as doctors have a duty to their patients, so do central banks to society.

“Do no harm” principle

Graph 8

“Do no harm”: new forms of money supplied by the central bank should continue supporting the fulfilment of public policy objectives and should not interfere with or impede a central bank’s ability to carry out its mandate for monetary and financial stability.

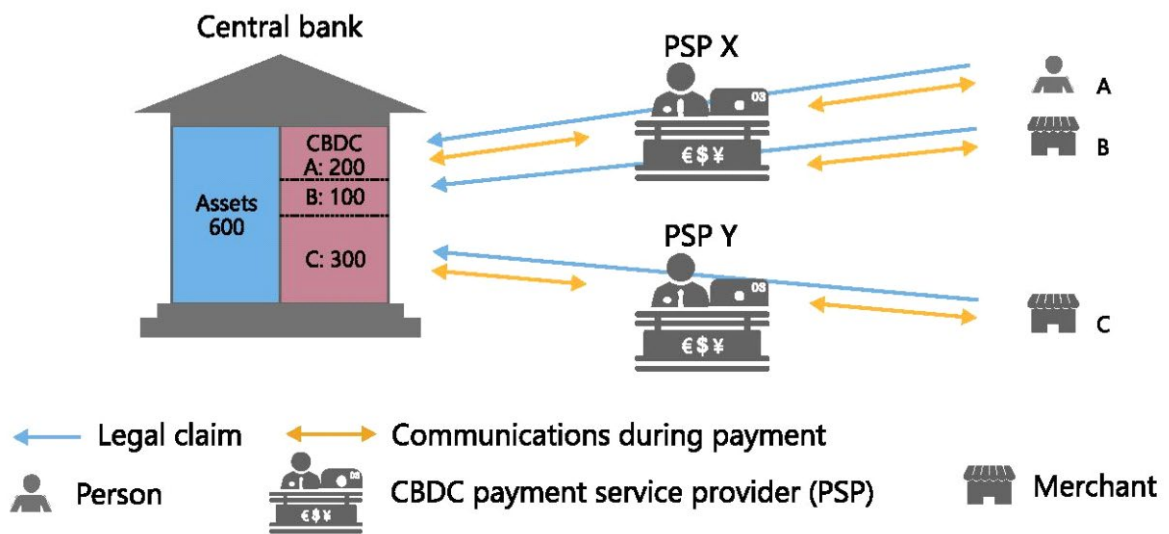
Source: Group of Central Banks, *Central bank digital currencies: foundational principles and core features*, October 2020.

Crucially, this principle is not about protecting the vested interests of incumbent financial institutions. It is about creating a more efficient financial system and economy, supporting central banks’ mission of providing monetary and financial stability, and economic growth.

CBDCs would be part of an ecosystem with a range of private providers (Graph 9). Similar to FPS, retail CBDCs may even allow additional new (non-bank) players into the payments market. Greater competition could further lower transaction fees and encourage innovation. Private providers could collect small transaction fees, which could be regulated, as is the case today. Rules would be needed to share the costs between the public and private sectors – as, for example, with cash or checks today. One goal is to build an infrastructure that allows for more competition, which may mean more payment providers.

One outcome is that a flood of new players could “disrupt markets”, a natural and healthy process in a market economy. This is part of Schumpeterian “creative destruction” and has helped make modern economies successful and adaptable.

Indeed, digital disruption has already arrived in payments. Big tech payment services are growing fast. They have offered many benefits, including to financial inclusion. But as we’ve seen in China and other markets, they can quickly become dominant, creating “walled gardens”. These may be very convenient for users, but they are closed-loop systems that do not allow for data protection. These walled gardens risk undermining the benefits that competition brings to financial services. Risks could be especially large for big tech-backed stablecoins.



Source: R Auer and R Boehme, "The technology of retail central bank digital currency", *BIS Quarterly Review*, March 2020, pp 85–100.

While CBDCs could pressure banks' profits, they are not intended to crowd out banks – and need not do so, even if they pay interest.¹⁸ Banks should continue to play their intermediation role between savers and investors. Of course, runs can occur. Central banks worry about "digital runs" from banks to CBDCs in times of stress, so some frictions to control inflows into the CBDC will be needed. Exactly what form these restrictions should take is the subject of ongoing research and debate.¹⁹

In this light, whether to pay interest is an important decision, and can influence the ultimate size of CBDCs. Cash does not pay interest, and despite some growth recently, the value of cash in circulation is small compared with sight deposits in most economies (Graph 10). My sense is that CBDCs should also be small in size relative to the financial system, acting primarily as a means of payment rather than a store of value. Still, by offering users an outside option with regard to universal access, costs, data privacy and safety, they could put competitive pressure on other means of payment, thus winning a broader influence.

Central banks today do not need to issue a CBDC for monetary policy reasons. Nevertheless, a CBDC would affect the transmission and implementation of monetary policy. It would affect the interaction with commercial banks and their reserve holdings, the monetary base and the transactional demand for money. These effects should be studied carefully.

¹⁸ See eg D Andolfatto, "Assessing the impact of central bank digital currency on private banks", *Federal Reserve Bank of St Louis Working Papers*, no 2018-26b, 2018; and J Fernandez-Villaverde, D Sanches, L Schilling and H Uhlig, "Central bank digital currency: central banking for all?", *NBER Working Papers*, no 26753, 2020.

¹⁹ See eg U Bindseil, "Tiered CBDC and the financial system", *ECB Working Papers*, no 2351, 2020.



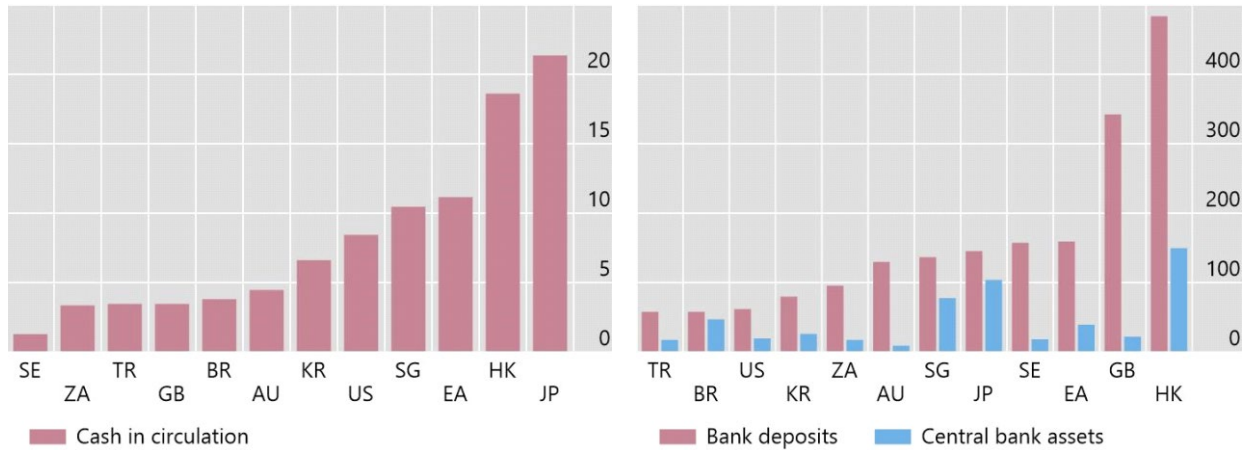
CBDCs can be designed to have a limited systemic footprint – like cash today

As a percentage of GDP

Graph 10

Cash holdings are moderate...¹

...and consumers' sight deposits vastly exceed central bank balance sheet sizes^{1,2}



¹ Data for 2019. ² Closest alternative where data are not available.

Source: R Auer and R Boehme, "Central bank digital currency: the quest for minimally invasive technology", *BIS Working Papers*, forthcoming.

4. The international dimension: working together

The final question I want to address is what CBDCs would mean for the international monetary system. There is rightfully a lively debate on this, but I feel there is also some confusion on key issues. I offer three observations to put the debate on a firmer footing.

First, CBDCs could enhance the efficiency of cross-border payments – without creating a new global unit of account as envisioned in global stablecoin arrangements. In particular, there is promise in multi-CBDC (mCBDC) arrangements to improve the interaction of CBDCs across borders. These enhance the interoperability between national CBDCs, by improving compatibility, interlinking or integrating national payment systems.²⁰

I am convinced that the future of the international financial system relies on fostering the seamless convertibility of one sovereign currency into another. This is precisely the solution that central banks have pursued for many years and are continuing to pursue.

mCBDC arrangements could start from a clean slate and thereby tackle frictions in today's correspondent banking system, such as differences in the opening hours of payment systems, varying communication standards and a lack of transparency around exchange rates or fees.

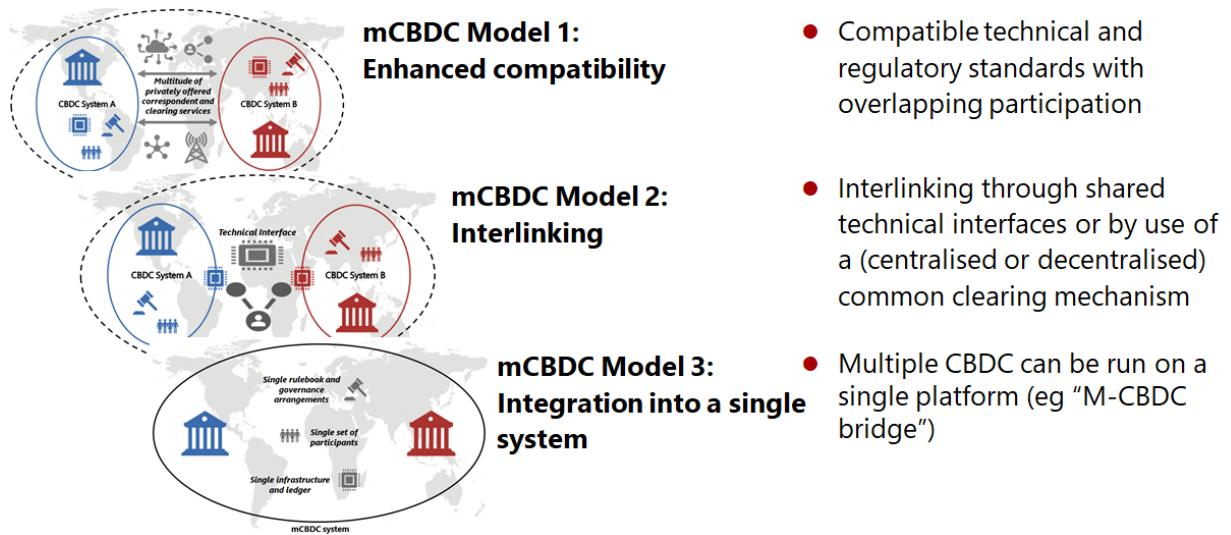
A recent BIS Paper has categorised the technological options, which are: (i) enhanced compatibility; (ii) interlinking through shared technical interfaces; and (iii) integration into a single system (Graph 11).

²⁰ See R Auer, P Haene and H Holden, "Multi-CBDC arrangements and the future of cross-border payments", *BIS Papers*, no 115, March 2021.

As an example, in the intermediate interlinking model, a shared technical interface can bridge two separate payment systems. Thus participants in one system make payments to those in another directly through the technical interface, without go-betweens.

Multi-CBDC arrangements can facilitate cross-border payments

Graph 11



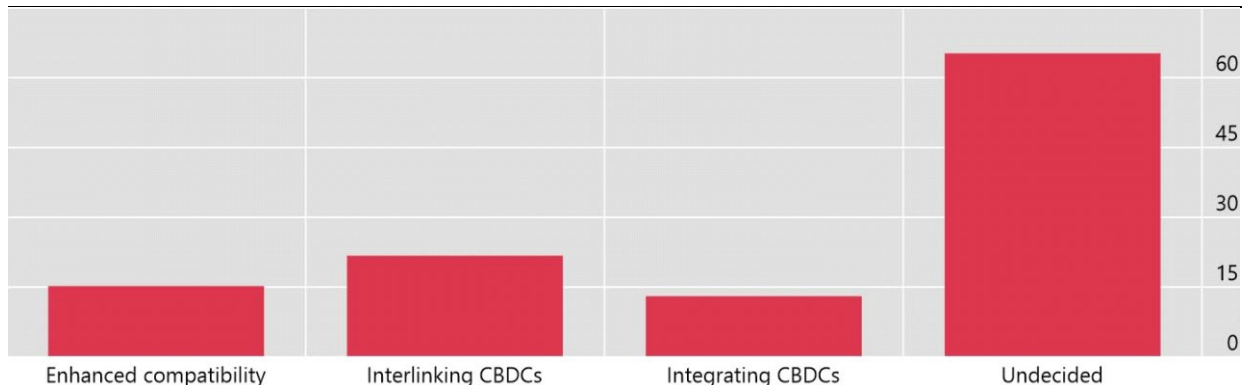
Source: R Auer, P Haene and H Holden, "Multi-CBDC arrangements and the future of cross-border payments", *BIS Papers*, no 115, 2021.

These are not mere theoretical considerations. A new survey of 46 central banks, which I can preview for you here today, suggests that each of these models is under consideration (Graph 12). The option of interlinking CBDCs seems to be gaining particular traction – though the work here is still preliminary.

Which mCBDC model are central banks considering?¹

As a percentage of respondents

Graph 12



¹ The survey question read "Which features are you considering? A: mCBDC arrangement 1: Enhancing compatibility with international standards; B: mCBDC arrangement 2: Interlinking your CBDC system with a foreign system; C: mCBDC arrangement 3: Integrating your CBDC into a single mCBDC system. More than one answer possible." For further details, see Auer et al, forthcoming).

Source: R Auer, C Boar, G Cornelli, J Frost, H Holden and A Wehrli, "CBDCs beyond borders: results from a survey of central banks", *BIS Papers*, forthcoming.

One example is the mCBDC Bridge project of the BIS Innovation Hub and partner central banks. This project by the central banks of Hong Kong SAR, Thailand, China and the United Arab Emirates offers a chance to test new technology, and to understand how such arrangements could work in practice. We look forward to sharing more on this progress later this year.

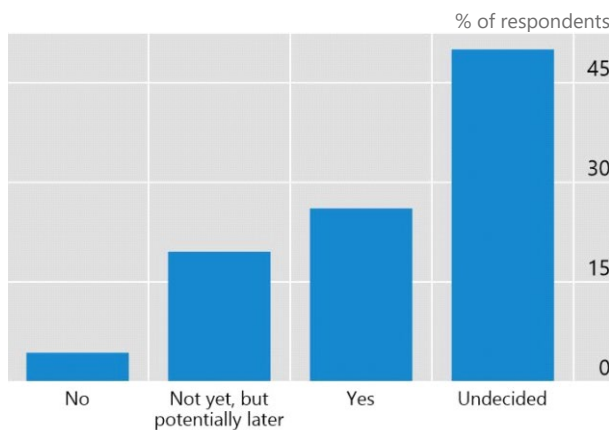
A second observation concerns the risks of currency substitution – that is, widespread adoption of a foreign retail CBDC. This can also be understood as “digital dollarisation”, or insert the currency of your choice here.

Central banks know CBDCs could, in principle, make it even easier for users to adopt a foreign (digital) alternative. Again, this comes out of the recent survey (Graph 13).

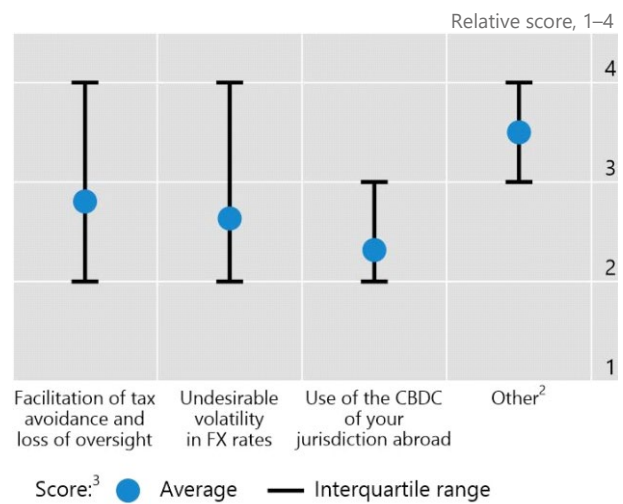
Cross-border CBDC use is considered, but central banks are cognisant of risks

Graph 13

Domestic use by foreign residents?¹



How important are the following risks?



¹ The survey question read, “Do you envisage the design of a CBDC allowing foreign residents to use the CBDC inside your jurisdiction (eg tourists)?”. ² Includes AML/CFT, cyber risk, ease of settlement, emergence of a foreign CBDC as a dominant vehicle in the domestic market, imbalance of capital outflow, monetary control and financial stability, significant non-domestic use due to lack of control, redundancy of payment systems, remittances, security and USD parity. ³ 4 = very important; 3 = important; 2 = somewhat important; 1 = not so important.

Source: R Auer, C Boar, G Cornelli, J Frost, H Holden and A Wehri, “CBDCs beyond borders: results from a survey of central banks”, *BIS Papers*, forthcoming.

Yet most CBDC proposals to date are account-based – tied to a clear identification scheme – and rightfully so. It is crucial to trace transactions, particularly large ones, to an individual or entity. For account-based CBDCs, issuing central banks would retain control over cross-border usage. Restricting non-residents’ access reduces the risk of volatile flows, and of currency substitution in recipient economies.²¹ Where token-based CBDCs are being considered, it is generally for smaller transactions and with clear limits and safeguards.²²

²¹ This is not very different from what happens today in terms of the rules by which non-residents can open a bank account in a foreign country.

²² See C Kahn and F Rivadeneyra, “Security and convenience of a central bank digital currency”, *Bank of Canada Staff Analytical Note*, no 2020-21, 2020; and C Kahn, F Rivadeneyra and T Wong, “Eggs in one basket: security and convenience of digital currencies”, *Bank of Canada Staff Working Paper*, no 2021-6, 2021.



Moreover, there are policy tools in recipient economies to address the concerns of digital currency substitution. In particular, robust legal tender provisions may promote the use of the national currency in domestic payments. Above all, central banks must continue to ensure the stability of the domestic currency so users prefer it to foreign CBDCs.

Third, some have argued that there is a first-mover advantage in CBDCs, or even that CBDCs could become an instrument of international reserve currency competition or of geopolitics.²³

Much of this rhetoric is overblown. Central banks operate under domestic mandates, and will decide to issue a CBDC only when it is appropriate for their jurisdiction's circumstances. International reserve currency status is driven by a range of factors. These include the depth, efficiency and openness of financial markets in a currency, trust in its long-run value and confidence in the institutional and legal infrastructure. It is unlikely that a digital currency will take off as a global reserve currency owing to its digital nature alone.

In any event, international cooperation is critical in addressing these issues. At the global level, I see regular cooperation between central banks on monetary issues. And CBDC design is a global effort of collaboration rather than competition. Efforts to improve cross-border payments are coordinated by the G20 – which includes the authorities of China, the European Union, the United States and all other major economies – and conceptualised in international forums. At the BIS Innovation Hub, such work is being put into practice in joint, collaborative projects.

The result of this global collaboration will be improved international payment arrangements. Globally coordinated CBDC design efforts and mCBDC arrangements will also offer a worthy alternative to privately issued stablecoins or cryptocurrencies which are not coordinated internationally with societal objectives in mind. I am confident that open dialogue between central banks, each in close consultation with their own societies, can foster cooperative policy outcomes.

Conclusion

CBDCs are an opportunity for central banks to offer a technologically advanced representation of central bank money for the digital economy. The crucial novelty is that CBDCs offer the unique characteristics of central bank money as safe, neutral and final. They are not necessarily the best option for every jurisdiction. Retail fast payment systems, in particular, may offer many similar benefits. For users, the two may look similar. Central banks around the world will each act in line with their own mandates, reflecting the unique circumstances and objectives of their society.

In both cases, the private sector will need to play a key role in retail-facing services, account opening and a range of further activities. While CBDCs may enhance efficiency and foster innovation competition in payments, they should not upend today's two-tier financial system.

Cooperation across borders ensures that central banks can continue to learn from one another and to grasp the opportunities of CBDCs for cross-border payments. This is very much a global collaborative effort, aimed at building mutually beneficial outcomes. The BIS is proud to support this work, for the benefit of all.

²³ See A Kumar and E Rosenbach, "Could China's digital currency unseat the dollar? American economic and geopolitical power is at stake", *Foreign Affairs*, May 2020.