

# Central Bank Digital Currencies: Opportunities, Risk and Disruption

## Broader Adoption of CBDCs Opens up New Possibilities, But Brings Risks

“The deployment of CBDCs will create opportunities to strengthen financial system inclusion, innovation, resilience and efficiency, but may also give rise to new risks.”

Monsur Hussain, Fitch Ratings

A number of countries have begun to experiment with a general-purpose central bank digital currency (CBDC), with others likely to launch pilot schemes in the next two years. The authorities will face trade-offs between the risks and benefits associated with a widely used CBDC as they take this work forward.

### Adapting to a Digital Age

The key benefits of CBDCs lie in their potential to enhance cashless payments backed by an authority, with innovations in step with the wider digitalisation of day-to-day lives. For central banks in some emerging markets (EMs), a key driver for researching CBDCs is the opportunity to bring underbanked communities into the financial system, and improve the cost, speed and resilience of payments.

Some advocates see CBDCs as a way of addressing the challenges presented by the declining use of cash in many economies, with various forms of digital money and electronic payment systems – often from the private sector – playing a growing role. The rise of digital payment systems, which have strong network effects, can create oligopolies among payment-system providers.

Widespread use of CBDCs could erode private providers’ monopoly over payments-related data and improve the central banks’ capacity to track and trace financial transaction data for money laundering and prevention of financial crime. However, if CBDCs offer less privacy than cash, some users may be more wary about using them.

A CBDC may open up new policy options for the authorities, such as transfers into CBDC wallets as part of disaster relief or stimulus efforts. The programmability of CBDCs offers further avenues for flexibility – including the potential to influence social behaviour. However, attaching such features to CBDCs may make them less attractive to users, relative to cash.

### Disintermediation and Other Risks

These benefits are offset with risks. Notably, in some circumstances, CBDCs could result in disintermediation between deposits and the banking system, adding to credit strains in some banks and pushing up interest rates. The probability of this happening can be reduced by adjusting the design of the CBDC and CBDC “wallets” (accounts), but this may also deter take-up.

Central banks may face additional complexities as the use of CBDCs increases. Widespread use of CBDC wallets could create more dispersed touchpoints between the central bank and the economy, which would increase cybersecurity threats for the central bank if not managed.

### Related Research

[China Focus on Online Lending Risk Evident in Ant Developments \(April 2021\)](#)

[China’s Tougher Online Loan Rules Unlikely to Hurt Rated Banks \(March 2021\)](#)

[FinTechs, Banks Could Benefit from Big Tech Data-Sharing Regulation \(January 2021\)](#)

[The Next Phase: Megatrends and Financial Institutions’ Ratings \(November 2020\)](#)

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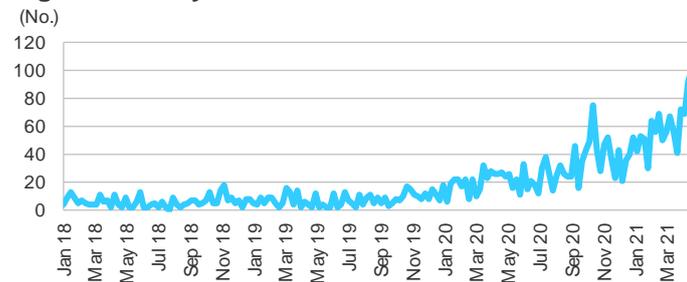
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## CBDCs Draw Growing Interest

CBDCs have been described as a digital equivalent of cash. The Bank of International Settlements (BIS) defines them as a digital payment instrument, denominated in the national unit of account, that is a direct liability of the central bank. To be effective, a CBDC also requires a supporting ecosystem to allow it to be distributed conveniently to end-users.

The focus of this report will be on CBDCs that are targeted broadly at the retail payment sector, rather than so-called “wholesale” CBDCs which are restricted to use between the central bank and financial sector (sometimes including large companies).

### Weekly Worldwide Google Searches for "Central Bank Digital Currency"



Source: Fitch Ratings, Google Trends

Policymakers' level of interest in CBDCs and the role they can play in financial systems has increased sharply in the last two years, particularly among EM-based central banks. Discussion notably intensified in the wake of Facebook's confirmation in 2019 of its plans to issue a private digital currency (then known as Libra, now as Diem), that is neither the liability of any individual or institution nor backed by any authority. Nonetheless, only a few jurisdictions have moved beyond research.

The Bahamas officially launched its “Sand Dollar” CBDC in October 2020, while China is among the more major jurisdictions to have launched ‘real-world’ CBDC pilot projects. Others that have also done so include Uruguay, Sweden, Canada, South Korea and Thailand.

## Reaching Underserved Communities

For the Bahamas, as with many other EMs, a key consideration in launching a CBDC was a desire to improve financial inclusion, particularly for communities underserved by banks.

One of the ways that CBDCs enable this is through the provision of CBDC accounts that require less know-your-client (KYC) documentation than traditional bank accounts. In the Bahamas, for example, wallets enabled for basic, low-value CBDC transactions can be set up with just an email or phone number used for identification. The level of permitted transactions can also be raised with the provision of more KYC documentation.

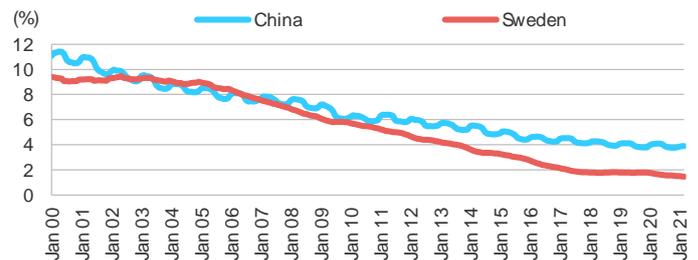
Bringing underserved individuals into the formal financial system in this way can allow them to develop credit profiles and facilitate their future access to credit. It also serves to improve the authorities' ability to track financial activity and thereby manage monetary policy, by capturing activity that would otherwise have occurred informally.

## Improving Payment System Resilience

Another reason central banks may issue CBDCs is a wish to make payment systems more resilient. The declining role of cash, the traditional back-up to digital money, in many financial systems has increased the urgency of finding alternative safe, publicly issued payment options. To provide one example: it can be tough for tourists to make payments in countries where digital cash is dominant.

### The Role of Cash is Declining in Some Countries

Currency in circulation as % share of broad money (M2)



Note: Rolling 6-month average figure

Source: Fitch Ratings, Haver Analytics, People's Bank of China, Statistiska Centralbyran, Sveriges Riksbank

In disaster-prone countries, it can also be easier to restore mobile-based internet access than physical bank infrastructure. In such circumstances, CBDC-based payment systems may be easier to restore than those reliant on banks.

## Domestic Payment Efficiency Gains

CBDCs may be able to provide some support to economic productivity, particularly through enhancing the reach and efficiency of payment systems. Efficiency gains may be easier to achieve in emerging markets where existing payment systems leave segments of the population underserved.

CBDCs may play a role in strengthening the diversity of payment systems and therefore encouraging competition, particularly in the face of network effects that can nudge market participants to a narrow set of payment-system providers. The growing role of digital payment systems and money has sharpened the focus on this issue, notably in China.

Competition may be enhanced through the creation of “public option” payment systems for CBDCs, as opposed to having existing payment-service providers provide the infrastructure for such transactions. As they will need to be accepted wherever electronic payments are taken, this could ultimately weaken the use of existing dominant payment services.

However, public option systems may replicate existing payment infrastructure, at a significant cost, and it is not clear that they would be more efficient than those run by private-sector firms.

Alternatively, authorities can require existing systems to be made compatible for CBDC usage and ease access to new entrants, for example by providing more firms and start-ups access to the centralised CBDC payments system and data, albeit with controls to manage user privacy. New entrants may develop CBDC wallets and enhanced applications that better serve consumer needs.

## Technology Opens up Opportunities

More broadly, CBDC pilot projects should encourage financial innovation, by creating a platform that will allow money to move through the domestic and global economy in interesting ways.

The increased number of central bank touch-points into the economy and the danger of hackers usurping central banks' role in money creation means the rollout of CBDCs will increase cybersecurity risks. However, this may stimulate offsetting improvements in cybersecurity. Distributed ledger technologies (DLT) may have a role to play in this, though constraints around speed, the volume of transaction processing, and settlement finality currently pose obstacles.

In addition, a number of options may be opened up by the programmability of digital money. Central banks could, for example, embed restrictions in the usage of CBDCs to advance social goals, or build in expiry dates to encourage rapid spending. Such measures could enhance the impact of monetary policy, but encumbrance with such functions could deter CBDC usage.

## Additional Policy Flexibility

Widespread take-up of CBDC wallets could offer the authorities other new policy tools. Transfers to individuals' CBDC wallets could, for example, act as a form of stimulus or relief in times of disaster.

Such transfers might offer a more efficient and effective means of providing transfers compared with existing options available to policymakers. However, this would depend on the nature of the CBDC systems in use and the intended goals of the transfer programme.

If central banks pay interest on CBDC wallets, it could allow for swifter and fuller pass-through of changes in policy interest rates to those holding funds in CBDC wallets, though this would raise disintermediation risks (see below).

In theory, if CBDCs were ultimately to replace cash they might ease the passage of interest rates into negative territory, as negative rates could be levied on CBDCs and bank deposits, and depositors would no longer be able to hold funds in cash. However, we view the prospect of complete displacement of cash as unlikely, and in practice depositors might find alternative ways to hold funds in such a scenario.

## Payment Transaction Data Access

The degree of anonymity in CBDC transactions will depend on decisions by the relevant regulators, but we generally expect CBDCs to strengthen central banks' visibility over financial system transactions. Wide use of CBDCs should therefore strengthen efforts to counter money laundering and combat financial crime.

Depending on which entities were permitted access, CBDCs could also allow financial institutions and credit reference bureaus to strengthen their artificial intelligence (AI) and machine-learning capabilities, using the mass of payments data. In a number of markets access to this data is currently limited, giving a competitive advantage to the payment systems providers that hold it.

## Improved Cross-Border Payments

There are better prospects, more generally, for enhancing the efficiency of cross-border payments. This is an area that the G20 has made a focus.

CBDCs would face many of the same challenges that hold back other cross-border payment systems. These include differences between national legal and regulatory frameworks, and interoperability issues associated with the multiple payment systems used.

If these obstacles can be overcome, CBDCs could help to increase the speed and reduce the cost of FX transfers. The construction of new CBDC cross-border payment systems may allow legacy inefficiencies and standard variations built into current structures to be circumvented. The programmability of digital currencies could also improve KYC capabilities.

For correspondent banks, improvements in efficiency could crimp revenues if they reduce earnings associated with processing cross-border payments. Profit margins on such business could also narrow if CBDC systems facilitate the entrance of new competitors, or authorities impose caps on transaction fees.

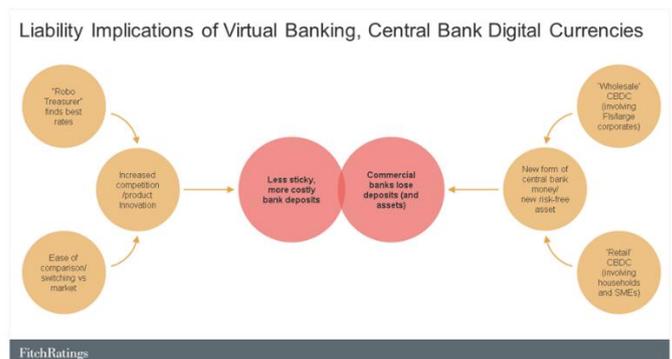
## Disintermediation Risks

We believe the introduction of CBDCs will inevitably involve households and businesses converting some of their commercial bank deposits into CBDCs. All other things being equal, this would require banks to shrink their balance sheets – a process known as disintermediation.

A potentially significant risk posed by the broader introduction of CBDCs is that disintermediation could occur at a destabilising rate, for example by triggering a sharp contraction in bank lending. The potential for bank runs could even increase in stress scenarios.

Investors may view CBDCs as risk-free, being backed by the central bank. Such risks would be likely to rise if CBDC wallets were managed directly by the CBDC, rather than being administered by authorised financial institutions.

Even in the latter case, funds may still flow from deposit accounts into CBDC wallets if fears rise over financial instability. This risk could grow if interest rates fall close to zero, diminishing the attractiveness of holding funds in deposit accounts. In many ways, this effect is similar to the existing danger that depositors may convert their account holdings into cash during a crisis.



Disintermediation risks can be managed, for example by caps on the amounts that can be held in CBDC wallets or through programmability functions that deter CBDC holdings, such as negative interest rates. However, political pressure could impede central banks' ability to take this type of action in a crisis. Moreover, such measures may also deter uptake of CBDCs and weaken their function as a means of exchange.

Alternatively, central banks could lend funds held in CBDC accounts back to banks. The heightened state involvement in the allocation of funds within the financial sector that this would involve could make this option unpalatable in some countries. However, this is likely to be less of an issue in markets like China where banking systems are already tightly controlled by the state.

## Privacy Trade-offs

Another challenge faced by CBDCs is how to replicate the anonymity of cash. Users may be reluctant to accept a digital cash substitute if it does not grant a sufficient degree of privacy. However, trade-offs exist between anonymity and the ability of regulators to track and counter unlawful activity. Indeed, regulatory reporting requirements exist even with cash.

There may be variations in anonymity between markets, depending on local attitudes among the public and regulators. Party identification data may, for example, be limited between transaction participants. However, we believe in general that central banks and regulators are likely to have access to such information with CBDC transactions.

## Encouraging Usage May Create Risks

One of the uncertainties around the effects of CBDCs on financial systems concerns the steps that authorities will take to encourage their usage. If enthusiasm for CBDCs is weak, policymakers may offer incentives to draw funds into CBDC wallets, which could have more disruptive effects on bank deposits. Regulators may also require businesses and banks to support CBDC payment systems, imposing cost burdens.

Generally speaking, the more actively the authorities promote the take-up of CBDCs, the greater the risk that they may have a disruptive effect on other parts of the financial system.

## Characteristics of China's CBDC Pilot

China's pilot CBDC, known as Digital Currency and Electronic Payment (DC/EP), provides a useful illustration of how policymakers may approach the challenges of CBDCs in practice. The scheme has been tested in a number of cities since early 2020, and has grown progressively larger in terms of scope and number of participants, reaching a reported half a million users under the latest trial during 1Q21.

Under regulators' supervision and standards, authorised intermediary institutions – such as commercial banks and payment service providers – manage DC/EP wallets, as well as tasks like identity verification, payment services, and anti-money laundering

(AML) and fraud efforts. The People's Bank of China (PBoC) distributes DC/EP to these entities, which then pass it on to individuals and businesses.

As CBDCs are a central bank liability, the DC/EP in accounts managed by intermediaries do not appear on these entities' balance sheets. Entities managing accounts are not required to hold reserve accounts with the central bank, but must hold 100% reserve ratios for DC/EP in their accounts. The DC/EP therefore has no deposit or money-multiplier effects. The PBoC does not pay interest on DC/EP account holdings.

A tiered system allows users to undertake small transactions anonymously, with larger transactions requiring wallets with more KYC verifications. Transactions are ultimately traceable, facilitating the PBoC's fight against financial crime. Payment-service providers submit periodic copies of CBDC holdings and transactions to the PBoC. The system uses a mix of conventional and DLT databases.

We believe China's CBDC is unlikely to contribute meaningfully to improvements in the efficiency of the country's payment systems, even if it were to become more widely adopted than the current DC/EP pilot. China's payment systems are already relatively efficient, and have benefited from widespread use of digital technologies by individuals, firms and payment-service providers.

One minor exception could be in rural areas that currently lack reliable internet access. DC/EP wallets are available as physical tools such as cards and wearables, whose offline functionality could ease transactions in such regions. However, there could be a risk of 'double-spending' – where a payer could try to use the same unit or token on two different transactions – unless this issue is managed.

## Impact on Chinese Payment Providers

The impact of the DC/EP on payment providers in China, such as Alipay and Weixin Pay<sup>1</sup> which dominate mobile-based payments, is limited at present but could grow in the longer term with wider adoption of the CBDC.

Although these intermediaries are able to provide DC/EP payment services, if authorised, it is possible that the new regulatory regime surrounding the DC/EP could change the revenue structure of existing providers of payment services over the medium term.

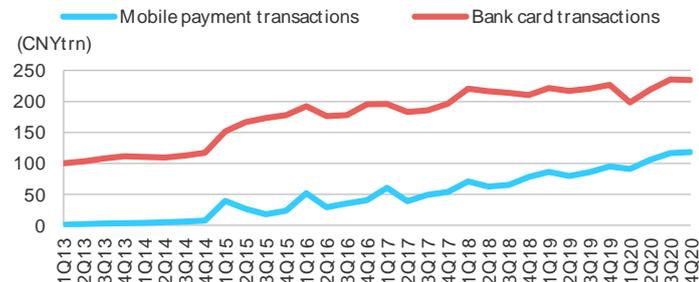
Competition amongst the existing fintech platforms could be heightened if the authorities were to enable more entities to access payment transaction data. If the government were to offer a public option CBDC payment system – which is not indicated by its announcements to date – this could raise further competitive challenges.

These challenges remain hypothetical and distant compared with recent developments affecting Chinese payment platforms. The government has already taken a number of steps to improve competitive dynamics in the financial technology services sector, such as requiring Ant to de-link its online microlending business and its Alipay payment platform.

<sup>1</sup> Weixin Pay is the domestic payment service operated by Tencent; its overseas equivalent is WeChat Pay. English-language sources sometimes use these terms interchangeably.

**Mobile Payments Play a Growing Role in China**

(Transaction value)



Source: Fitch Ratings, Haver Analytics, People's Bank of China

The impact of the DC/EP in eroding the competitive advantage enjoyed by firms like Ant and Tencent Holdings Limited (A+/Stable) through their access to large amounts of data on individuals' financial transactions should also be seen in the context of current regulatory developments, such as the pressure on mobile payment-service providers to share more transaction data with regulators. This has been accompanied by new regulations that seek to limit private firms' collection of excessive amounts of personal data. The impact of such moves may be felt well before CBDCs are widely adopted in China.

We expect Weixin Pay to be an increasingly important rating driver for Tencent, as it creates synergies for Tencent's other business segments. The financial contribution of payment services within the overall business may also increase. Tencent does not break out revenue for its fintech and business services, but we believe payment-service revenues to be less than 10% of total revenue at present, with margins narrower than Tencent's overall margins.

We expect the direct impact of developments affecting Ant on Alibaba Group Holding Limited's (A+/Stable) cash generation to be limited. Ant is a 33%-owned associated company of Alibaba, but has never paid any dividends to shareholders, including Alibaba. Alibaba's credit profile remains underpinned by its leading market positions in China's online shopping market and cloud computing services, its high free cash flow generation from its core commerce business, and a conservative capital structure with ample net cash.

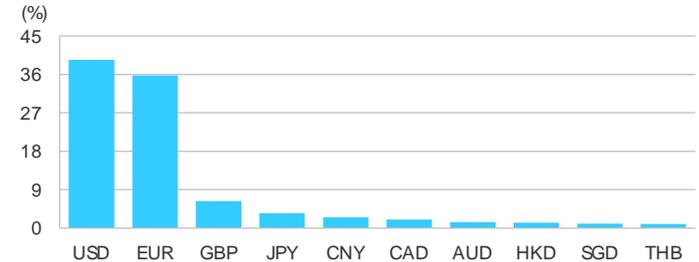
**Potential Challenge to US Dollar Ecosystem**

The DC/EP pilot project is focused on domestic aspects. However, the PBoC in February 2021 joined the Central Bank of the UAE, the Hong Kong Monetary Authority and the Bank of Thailand on Project Inthanon-LionRock, a multiple CBDC (m-CBDC) cross-border payment project. This indicates the authorities' interest in the potential for the DC/EP to play a role in international payments.

The role of the US dollar and US institutions in cross-border payments represents a source of vulnerability for China. A cross-border payment system able to bypass the payment systems that currently dominate international transactions could reduce China's exposure to US regulatory action, while increasing the financial footprint of the renminbi and buttressing its reserve currency role.

**The Renminbi's Share of Global Payments Remains Low**

(Share of global payments by value exchanged on SWIFT, March 2021)



Note: Top ten currencies

Source: Fitch Ratings, SWIFT RMB Tracker

Nonetheless, this would be a long-term project and would face considerable headwinds. Previous efforts to develop payment systems to bypass those controlled by the US have struggled, such as one launched by the EU to allow trade with Iran after the US tightened sanctions in 2018. This partly reflects the strong network effects enjoyed by incumbent systems, as well as the complexity of negotiating inter-operability between jurisdictions.

Geostrategic tensions between China and a number of western nations could restrict its efforts to define the international standards underpinning new CBDC cross-border payment systems. This would increase the risk of conflicting standards emerging, resulting in inter-operability problems that would curb the potential for efficiency gains through cross-border CBDC payments.

The DC/EP could potentially incorporate permissioning functions and would improve traceability. To the extent that this makes regulators more comfortable about their awareness of cross-border capital flows, it may facilitate capital-control loosening. Nonetheless, we do not believe this will be a major factor influencing China's willingness to relax such controls.

## Appendix: Selected Further Reading

[CBDCs: objectives and architectural considerations](#), Official Monetary and Financial Institutions Forum, May 2021

[Retail CBDCs: Policy implications and rollout strategies](#), Official Monetary and Financial Institutions Forum, May 2021

[The conflict between CBDC goals and design choices](#), VoxEU Centre for Economic Policy Research, May 2021

[Analysis: China digital currency trials show threat to Alipay, WeChat duopoly](#), Reuters, April 2021

[Central Bank of Bahamas makes progress with Sand dollar CBDC](#), Ledger Insights, April 2021

[The future of money is digital: How the cloud can deliver solutions for central bank digital currencies](#), AWS Public Sector Blog

[Central bank digital currencies: putting a big idea into practice](#), Bank of International Settlements, March 2021

[Multi-CBDC arrangements and the future of cross-border payments](#), Bank of International Settlements, March 2021

[The Front Runners](#), Official Monetary and Financial Institutions Forum, February 2021

[Digital currencies and the future of the monetary system](#), Bank of International Settlements, 27 January 2021

[Central bank digital currencies: foundational principles and core features](#), Bank of International Settlements, October 2020

[Rise of the central bank digital currencies: drivers, approaches and technologies](#), Bank of International Settlements, August 2020

[Getting funds to those in need and enabling access to money during COVID-19, part 3: Central bank digital currencies and other instruments](#), VoxEU Centre for Economic Policy Research, July 2020

[Central Bank Digital Currency Opportunities, challenges and design](#), Bank of England, March 2020

[Exploring anonymity in central bank digital currencies](#), European Central Bank, December 2019

[First Look: China's Central Bank Digital Currency](#), Binance Research, August 2019

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