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The Geopolitics of Cross-Border CBDCs

Elliot Hentov, Ph.D.
Head of Macro Policy Research

Selam Mola
Senior Associate, State Street Global Advisors

Executive Summary

The development of cross-border Central Bank Digital Currency (CBDC) holds the potential to shape the global financial order. The preferred model of CBDC usage in cross-border finance will facilitate trade and capital flows and, by proxy, economic integration with respective power blocs. Therefore, it matters which cross-border CBDC template becomes most widely adopted and which countries choose the respective template.

In this paper, we focus exclusively on the cross-border element of the CBDC design and the extent to which chosen CBDC models promote alternative payment networks, facilitate cross-border capital flows and lower barriers to accessing other countries' financial assets. With this perspective, we examined the geopolitical implications and found that the management of cross-border CBDC has the potential to affect standard measures of countries' positions in the global political, economic and financial order and, as such, is geopolitically relevant.

In detail, we arrived at the following three conclusions:

- Cross-border CBDCs are likely to promote more global financial fragmentation. It is unlikely that a world run on CBDCs would be globally more seamless than today's financial architecture.
- Great power competition (e.g., United States-China) will help frame countries' preferences for the particular model of cross-border CBDC access and exchange.
- The most operationally successful cross-border mechanism — as measured by reducing trading costs, raising efficiencies, ensuring transaction security and regulatory compliance — will invariably help drive capital flows.

At a minimum, this will have implications for the use of trading currencies, and presumably reduce global US dollar usage. The bigger de-dollarization question relies on whether cross-border CBDCs facilitate debt issuance and reserve asset management beyond today's options, a feature that existing cross-border CBDCs do not yet offer.

What is CBDC?

- A CBDC is the digital form of fiat currency, issued and backed by a country's central bank. It relies on a blockchain technology that is similar to cryptocurrencies (e.g., Bitcoin, Ethereum), but runs on a centralized ledger managed by the central bank and, therefore, has much lower energy usage.
- The key policy and technology considerations are the use case, i.e., whether to provide CBDCs for retail or wholesale usage. Even retail usage still largely implies reliance on financial intermediaries, as most central banks do not consider direct user interface.
- CBDCs could be issued either (a) in an account-based system (similar to today's use of fiat currency) where a verified account holder has access to CBDCs stored in the account, or (b) as digital tokens that only require cryptographic digital keys to be released or transferred.
- The advantages of a CBDC could be financial inclusion by facilitating access to the financial system. Additionally, there are untested assumptions that CBDCs could deliver cost savings and enhance payment systems, though this is dependent on the existing financial architecture in each country.
- Policymakers are particularly attracted to the idea that CBDCs could enhance the transmission of monetary policy by generating better data on capital allocation across the economy. In some instances, the technology would allow specific CBDC designs to support targeted policy objectives.
- For low-income countries, it could enable them to jump directly to digital banking, similar to how they entered mobile telephony — both a potential productivity and governance improvement.
- Range of progress varies greatly, with nearly 100 central banks actively experimenting. Most live CBDCs are only present in a few emerging markets. Among large economies, China is far ahead in terms of experimentation.

Introduction

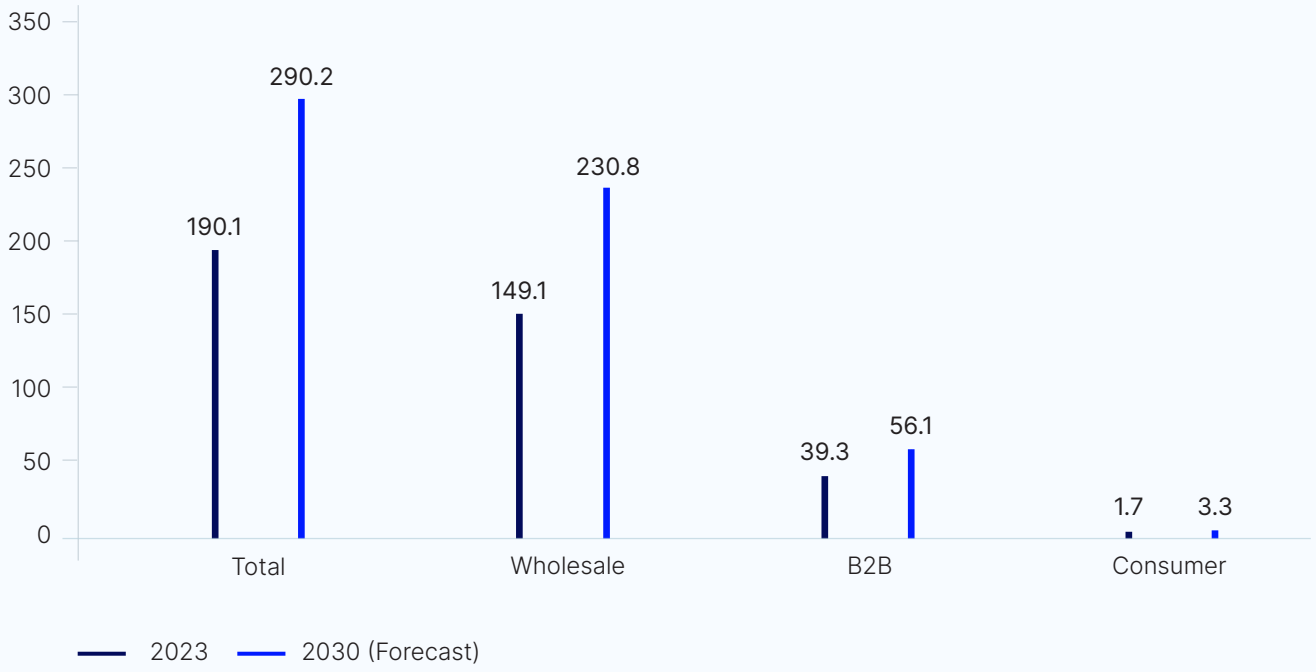
There is a very well established global payments industry that manages cross-border payments. The existing financial architecture (Figure 1) does not rely on blockchain and approaches US$200 trillion in value, steadily growing at roughly six percent per year and largely driven by wholesale and business-to-business needs.

Therefore, the economic benefits of cross-border CBDC projects would need to be self-evident and superior, enabling cheaper, faster and more accessible capital transactions.

If appealing, new emerging cross-border CBDC networks could alter contemporary patterns of global capital flows and cross-border holdings with associated geopolitical consequences.

The current debate about the prospects for de-dollarization of the global monetary system makes a forward-looking analysis of future cross-border CBDC templates acutely topical as it highlights the necessity of finding a financial infrastructure to support alternative systems.

Figure 1: Global Cross-Border Payments in 2023 and 2030
Forecast Global Cross-Border Payments (US$ trillion)



Source: Statista

Deep dive of CBDC models

Broadly, we see three models of CBDC development in geopolitical terms and lay out each concept and the main considerations that apply. The important questions are:

1. How is governance structured, i.e., who is making the rules?

2. How compatible is the model with domestic systems, i.e., how open and inclusive is the model?

3. Does it maintain flexibility or require a standardization on domestic CBDC design?

4. How scalable is the model, i.e., would it be able to quickly service the volumes required?

5. How secure and resilient would the model be?

Model 1: Trusted supranational intermediary

This model is basically replicating 20th-century governance for the era of CBDCs. In this model, a trusted supranational (e.g., the Bank for International Settlements [BIS]) is tasked with housing the intermediary mechanism that connects the respective national CBDCs and converts them.

Real-world example: Icebreaker

What is it?

Icebreaker is a BIS-sponsored hub that connects the CBDC systems of many countries (current trial participants include the central banks of Sweden, Norway and Israel). Each of these systems operates on different technologies, but the BIS provides the supranational, neutral intermediary point of communication to facilitate a currency exchange. There is no shared ledger technology between the various countries participating in Icebreaker.

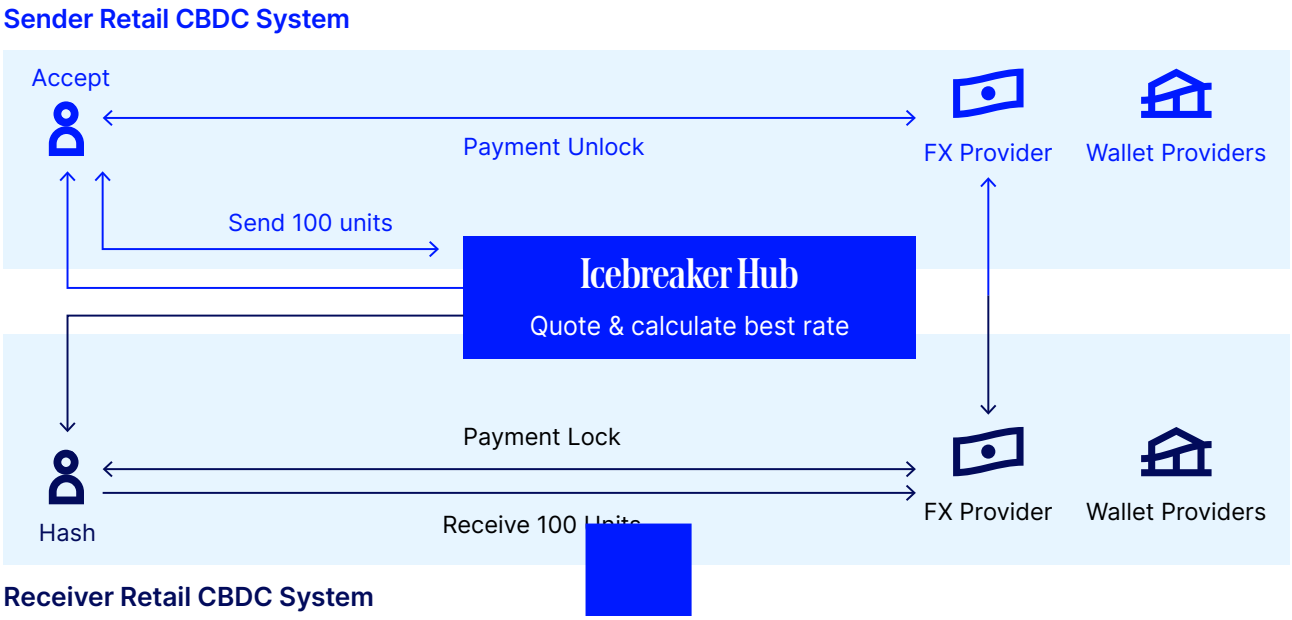
How does it work?

A cross-border transaction is broken down into two domestic payments, facilitated by a foreign exchange provider active in both domestic systems. Therefore, CBDCs can be retained in their own systems.

From a cross-border perspective, the capital 'flow' occurs on the balance sheet of the foreign exchange (FX) provider.

For example, Person A in Country A sends 100 units of their CBDC to Person B in Country B. This transaction is communicated to Icebreaker which selects the most optimal market pricing from participating FX providers. Provider X is automatically selected and receives 100 CBDCs from Person A in Country A, simultaneously sending the exchange equivalent to Person B in Country B.

- Two domestic payments, with the sender paying the FX provider in the sender's currency and the FX provider paying the receiver in the receiver's currency.
- Payment is executed in a way that ensures coordinated settlement in a peer-to-peer style. The receiver will only get the money if they provide the necessary information to the FX provider to claim the funds from the sender.
- Payment is completed by unlocking the locked payment. Sender currency wallet sends the payment information and the hash value to the FX provider's receiver's currency wallet via the Icebreaker hub.



Key features

The main use case is for retail CBDC cross-border payments. Icebreaker would link national retail CBDC systems regardless of their system design. Hence, it would have the ability to easily scale participating countries from a technological perspective.

- It is technology agnostic - central banks would have almost full autonomy in the system design, only requirements are basic levels of technological and financial depth (e.g., a real-time payments system, the ability to implement and support the use of hashed time-locked contracts, and a sufficient number of FX providers).
- However, it would not be agnostic about rules and governance. In fact, it would require members to have mutual regulatory recognition (especially governing Know Your Customer (KYC) and Anti-Money Laundering (AML) considerations). So, in practice, it would become an invitation-only group, limited by regulatory differences.
- From a financial perspective, it should ensure plentiful access to liquidity. Market forces would invite FX providers to bid for business and customers would receive market rates, presumably with equal or tighter bid-ask spreads than today.

Summary implication

This model would reinforce the existing global order, relying on current institutions and rules. Therefore, CBDC innovation would be limited to improved cross-border payments and would preclude other financial use cases.

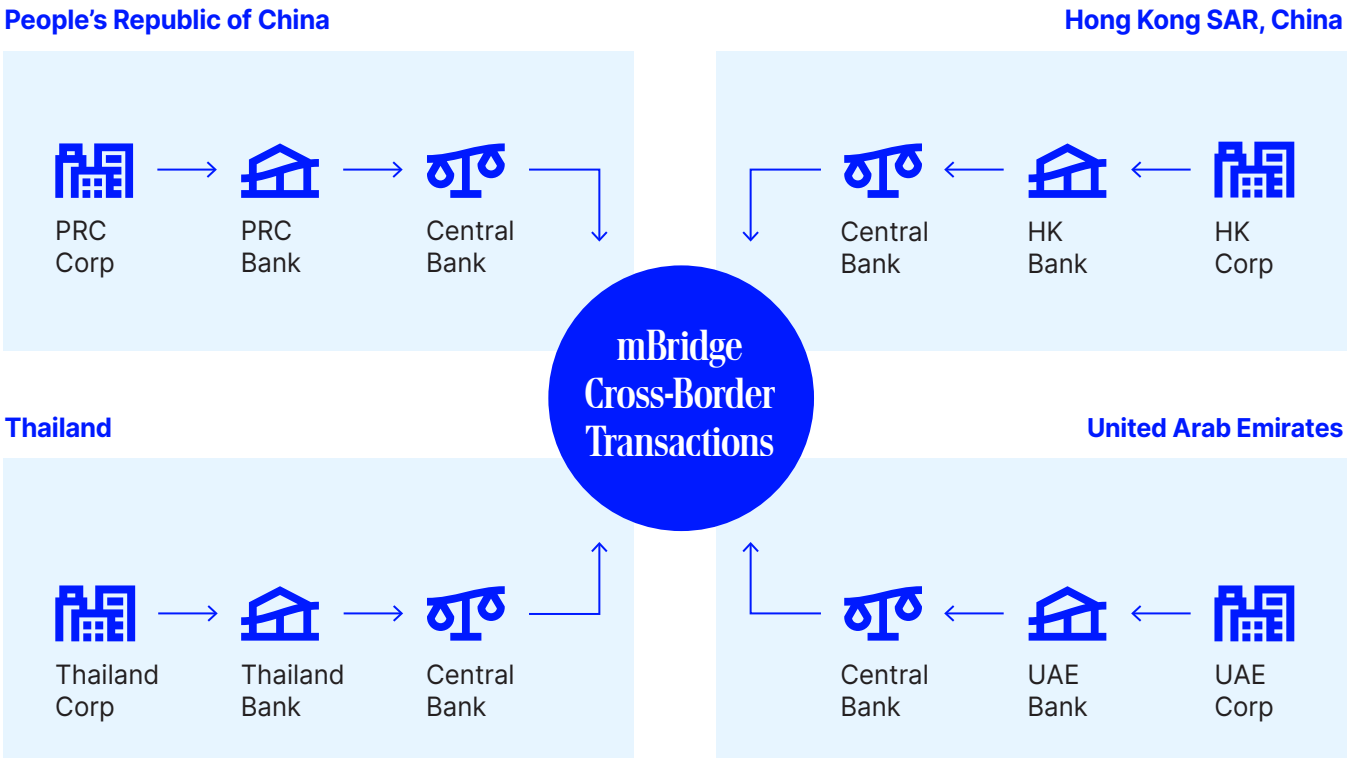
Model 2: New joint multi-CBDC infrastructure

In this model, we explore the creation of a new joint CBDC platform — a tangible shared digital infrastructure under a supranational umbrella. This model is similar to the Asian Infrastructure Investment Bank, which replicates supranational lending for infrastructure development, but pursues this with a different institutional framework and geopolitical composition.

Real-world example: mBridge (multiple CBDC bridge where currently four central banks and five commercial banks are trial participants)

What is it?

mBridge is a platform that connects the digital money of central banks using a custom-built private, permissioned blockchain. The project is a collaboration between the BIS and four national central banks: China, Hong Kong, Thailand and the United Arab Emirates (UAE). Unlike Icebreaker, the BIS here acts as the main coordinator for project development rather than an intermediary platform.



How does it work?

It is a template for direct global bank-to-bank coordination and act as a wholesale CBDC platform, i.e., an inter-bank and inter-central bank settlement. So transactions do not rely on third-party payment networks such as SWIFT.

Key features

- In its current form, it exhibits liquidity constraints because FX is off the platform as it is a bank-to-bank transaction. Future improvements for bringing FX pools onto the platform would raise liquidity availability.
- mBridge is supported by the BIS and four other central banks (the Hong Kong Monetary Authority, the Bank of Thailand, the Central Bank of the UAE and the People's Bank of China's Digital Currency Institute). However, the BIS acts as the main coordinator for project development purposes, but does not operate as the custodian of the platform, which remains the domain of participating central banks.
- mBridge enjoys the strong backing of China (President Xi Jinping has stated that advancing the mBridge project is a priority) which has automated the integration of cross-border CBDC issuance with its domestic CBDC system. This has saved time, showing higher issuance and redemption transactions.
- Regardless of the fact that mBridge is using a decentralized model to boost confidence in governance, some countries may be reluctant to commit to an infrastructure that is partly shaped by Chinese design. At the same time, many countries find it appealing to leverage advanced digital infrastructure that also provides access to an alternative payment system. If sufficiently developed, this could offer immunity to US financial sanctions, which largely rely on the existing payment infrastructure for jurisdiction and enforcement. This is also where it would merge with de-dollarization efforts in global trade.
- Current technology implies meaningful constraints on CBDC design for domestic usage in order to safeguard interoperability. This could hinder broader scalability and adoption.

Summary implication

This model reinforces the shift to multi-polarity in global payments by creating new multi-national infrastructure that bypasses existing structures. The process would be orderly and would try to build on global best practices in technological, financial and regulatory design.

Model 3: Shared governance

This multi-national CBDC would be more integrative than Model 2 and more akin to the governance of economic affairs in the European Union. In effect, sovereign issuers would pool sovereignty in the realm of digital currency.

Real-world example: ABER

What is it?

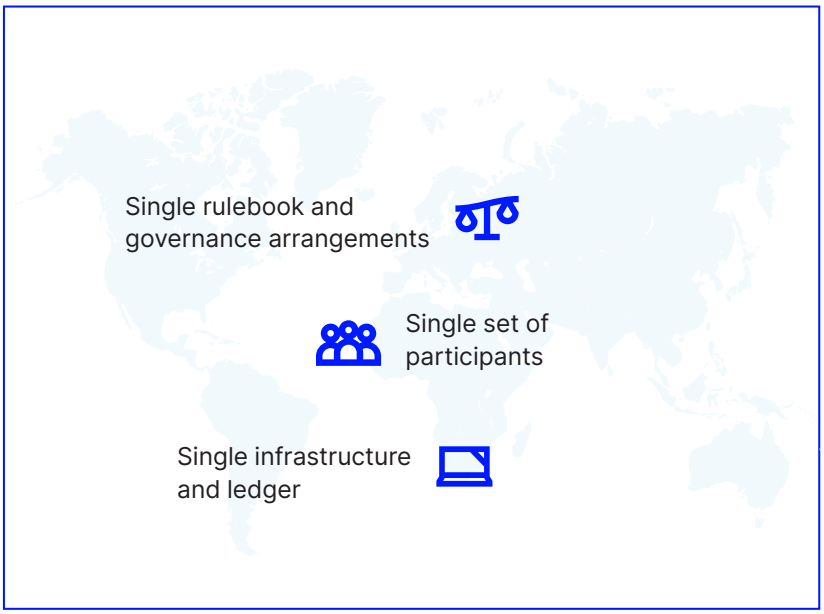
It is a commonly shared CBDC where each central bank (in ABER's case the UAE and Saudi Arabia) jointly issue and determine the volume. Only a financial institution chosen by these central banks would moderate transactions, with all recorded on a single private blockchain.

How does it work?

In essence, this is similar to a single entity CBDC, except that participating countries jointly issue retail CBDC on one private and permissioned distributed ledger.

mCBDC system

Model 3 – single mCBDC multi-currency system



- Single system with multiple CBDCs
- Central banks to agree on single rule book, single set of participation requirements and supporting infrastructure

Technical infrastructure

Rulebook and governance arrangements

Participation criteria

Payment system (Solid line)

Key features

- Central banks agree on a single rulebook, a single set of participants and supporting infrastructure.
- Given joint issuance, this is more suitable for wholesale usage as central banks can use regulatory powers to manage risks and usage. Retail application would be possible following the same concept.
- Large-scale adoption would effectively pave the way for a common currency, so this could work well for fixed exchange-rate regimes or areas converging toward monetary union, e.g., the Eurozone and neighboring economies.
- Banks (account-based model with intermediation) can open and manage this account directly through the supranational monetary authority responsible for the CBDC (disintermediated account-based model). An account-based model means that the common CBDC is stored on an account, accessible online and is associated with its holder.

Summary implication

This is technologically the most straight forward model, but it is not widely transferable. However, such an approach to joint CBDC could be the vehicle for regional integration in a "reglobalizing" world.

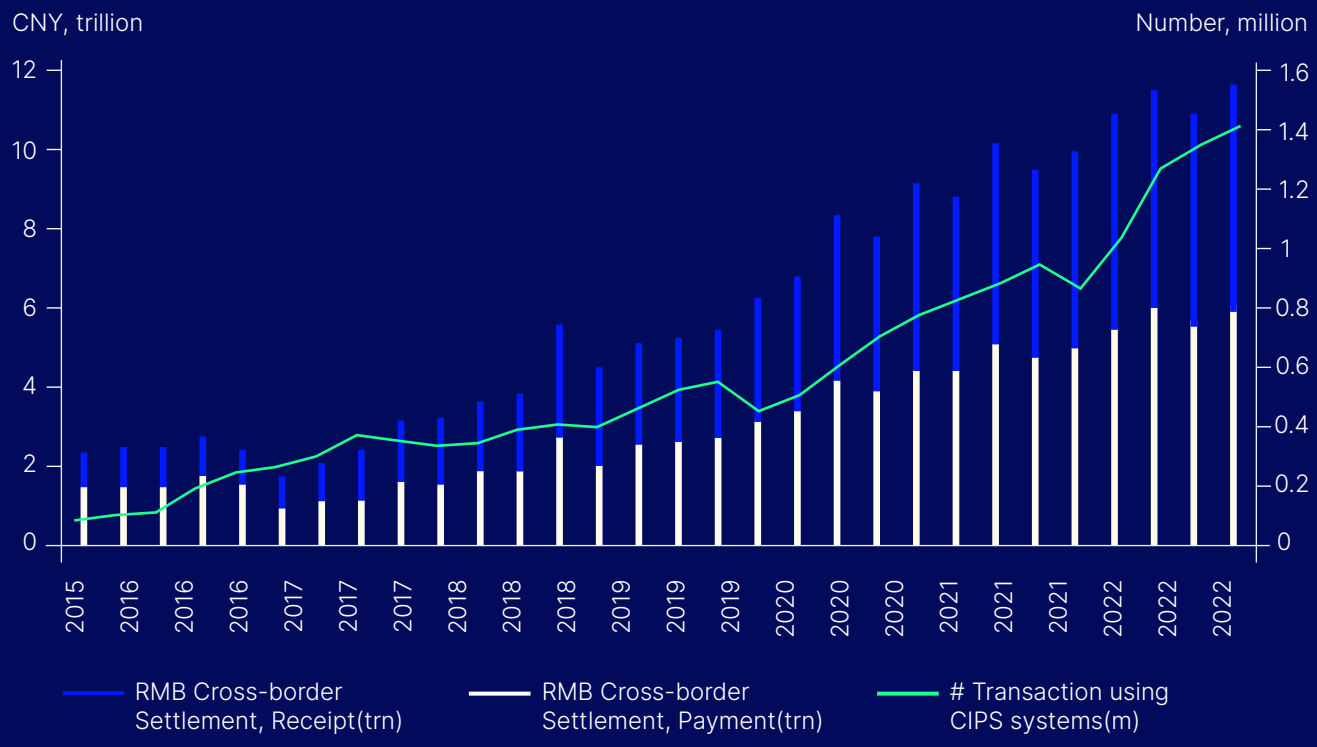
How does the international e-CNY fit into this context?

In addition to ensuring mBridge compatibility, the People's Bank of China (PBoC) has laid the groundwork for direct cross-border usage of e-CNY (also known as digital yuan). China is preparing to fold in CBDC issuance as part of its regular currency issuance, which would also imply the ability to hold currency abroad (i.e., the way cash notes are stored abroad).

For this purpose, the PBoC is proceeding rapidly in integrating CBDC into its mainstream toolbox, for example, by counting all e-CNY as part of cash in circulation data as of January 2023.

One challenge is that China's capital controls conflict with the unfettered cross-border use of e-CNY. There is also the risk that, at a certain threshold, the amount of e-CNY abroad would erode monetary policy transmission. There are estimates that roughly two-thirds of all US$100 notes are located outside of the US. If e-CNY offered direct access to CNY liquidity for non-Chinese residents, there would presumably be great demand to hold and use CNY to finance transactions abroad due to the recent uptick in the globalization of the renminbi (RMB) as shown (Figure 5).

Figure 5: Global RMB Cross-Border Settlement
The global use of Chinese renminbi is increasing



Source: People's Bank of China (PBoC)

With cash or other conventional CNY assets, the PBoC would likely want to ensure usage is aligned with policy objectives. This is where technology becomes relevant, as the potential monitoring and programmability of e-CNY are not only theoretical possibilities.

If required, China could probably apply those features, i.e., enable data insights into where CBDCs are accumulating and what transactions they are supporting. Hypothetically, such e-CNY could be programmed to only perform desirable transactions and have restrictive settings.

We present this possibility not because it reflects reality or is likely , but because the "optionality" itself would probably give policymakers comfort to experiment with greater e-CNY usage abroad .

Therefore, Chinese policymakers could manage the downside risks emanating from excessive e-CNY use abroad. The upside potential would remain unchanged, namely that easier access for traders or even smaller retail volumes would help contribute to undermining the US dollar as trading currency. For instance, Chinese tourists would no longer need to swap foreign currency abroad and smaller traders could conduct trade in e-CNY as well. The current contours of the e-CNY have a retail-oriented design, so this would not affect institutional usage or the appeal of the CNY as a reserve or funding currency. That said, China this year has allowed the domestic purchase of securities via a Chinese brokerage firm, and the cross-border rollout of such practices would amplify the appeal of the e-CNY abroad.

Other CBDCs and their challenges

There are several other multilateral attempts to establish a cross-border CBDC system, but they all largely follow similar principles of a neutral hub, joint infrastructure or shared sovereignty. Some seek to replicate the analog world by enabling authorized and regulated peer-to-peer transaction capability.

Real world examples: Dunbar, Mariana, Onyx, Mandala or Jura

Key features

- Different versions of private, permission-based blockchain that include either an automated market-making pool or payment-to-payment mechanisms to facilitate transactions in their process.
- Project Mariana uses an automated market maker to facilitate FX transactions, similar to project Dunbar.
- Most of these projects would allow nonresident financial institutions direct access to a country's CBDC.
- Most cross-border experimentation in developed countries, except for Dunbar, which is exclusively payment-focused.
- Most of these projects have challenges scaling beyond a small number of member countries, presumably pulled together due to institutional, financial, economic linkages.
- Some of these models may be more appealing in order to match regulatory and policy priorities.

Summary implication

It is unclear how scalable or competitive any of these models are, particularly compared to the ones established earlier in this paper. A variety of regulatory and financial stability risks remain underappreciated.

Conclusion

The development of cross-border CBDC holds the potential to shape the global financial order. Therefore, it matters which cross-border CBDC template becomes most widely adopted and which countries choose the respective template. Yet even today, we can only draw a few clear conclusions.

First, the initial developments suggest that cross-border CBDCs are likely to exacerbate global financial fragmentation, rather than smoothen contemporary frictions. It is very unlikely that a world run on CBDCs would be globally more seamless than today's financial architecture.

Also, great power competition in the form of the US-China rivalry will have spillover implications for the success of any dominant model, determining member countries' preferences.

Lastly, the most operationally successful cross-border mechanism, as measured by reducing trading costs, raising efficiencies, ensuring transaction security and regulatory compliance, will invariably help drive capital flows. In this regard, all pilot test cases demonstrated the potential value of lowering overhead costs, reducing settlement times and delivering more transparency.

At a minimum, this will have implications for the use of trading currencies and presumably reduce global US dollar usage. The bigger de-dollarization question relies on whether cross-border CBDCs facilitate debt issuance andreserve asset management beyond today's options. Again, given US dollar dominance here, CBDCs could offer such improvements, though existing templates are largely not geared for a major change in this domain.

Notes

1. This report emerged from collaboration with Georgetown University's McDonough school of Business Masters in Finance program

2. "Bank of International Settlements, "Lessons Learned on CBDCs", **www.bis.org/publ/othp73.pdf July 2023**

3. BIS Annual Economic Report. "Blueprint for the future monetary system: improving the old, enabling the new." **www.bis.org. https://www.bis.org/publ/arpdf/ar2023e3.htm** (20 June 2023).

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5. China Daily. "Full Text of Xi Jinping's Keynote Speech at China-GCC Summit." **www.chinadaily.com.cn.** www.chinadaily.com.cn/a/202212/10/WS6393e690a31057c47eba3b6c.html. (21 June 2023).

6. Bank of International Settlements. "Project Icebreaker: Breaking New Paths in Cross-Border Retail CBDC Payments." **www.bis.org. https://www.bis.org/publ/othp61.pdf** (March 2023).

7. Bank of International Settlements. "Project Mbridge: Connecting Economies through CBDC." **www.bis.org. https://www.bis.org/publ/othp59.htm** (26 October 2022).

8. International Monetary Fund. "How Should Central Banks Explore Central Bank Digital Currency?". **https://www.imf.org/en/Publications/fintech-notes/Issues/2023/09/08/How-Should-Central-Banks-Explore-Central-Bank-Digital-Currency.pdf** (September 2023)

State Street Corporation
One Congress Street, Boston, MA 02114-2016

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