

ASIA HOUSE RESEARCH

# THE DIGITAL RENMINBI AND ITS ECONOMIC PATHWAYS

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# THE DIGITAL RENMINBI AND ITS ECONOMIC PATHWAYS



## EXECUTIVE SUMMARY

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Central bank digital currencies (CBDCs) could constitute an indispensable policy tool. In time, they could replace cash altogether, crowding out commercial banks and other payment platforms, thus re-shaping the financial system. China's CBDC programme is innovative and advanced in its development compared with other pilot projects. It stands to re-shape the domestic economy, and China's cross-border relationships, potentially reducing US dollar dominance. And yet, despite China's CBDC being a significant development, there are preconditions to its future as a global reserve currency. These include being freely flexible, linked to a stable and liquid financial market that has depth, breadth and scale, and for the renminbi (RMB) to demonstrate political resilience.

This paper examines the pathways through which digitalisation could bolster the dominance of the renminbi in the global financial system.

## KEY TAKEAWAYS

- China's digital currency development is advanced compared with pilots by other central banks and, as such, it is likely to have first-mover advantage.
- The digital renminbi has the potential to reshape China's domestic economy and challenge the dominance of the US dollar.
- The digital RMB could have profound geopolitical implications, reducing the effectiveness of US sanctions and potentially extending Chinese influence within emerging Asian markets.
- It may also accelerate the liberalisation of China's bond market.
- The COVID-19 crisis could catalyse greater acceptance of the renminbi as a global reserve currency.

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## REPORT AUTHOR



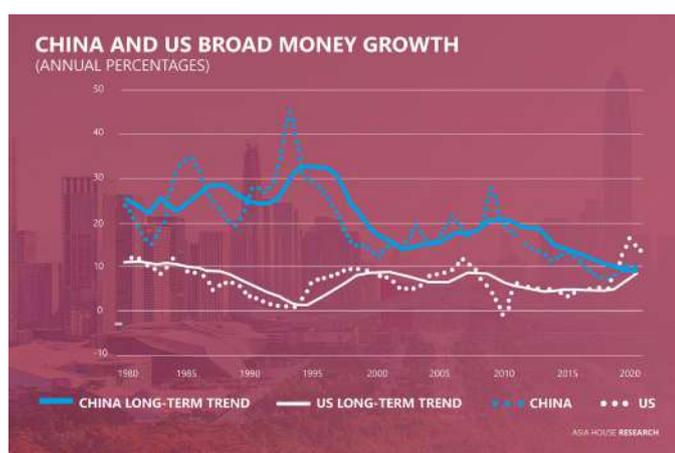
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# 1. INTRODUCTION

Currency digitalisation constitutes a new frontier in monetary policy, cross-border investments and in trade. Nearly 90 per cent of all global central banks, including the People’s Bank of China (PBOC), have been researching the potential for CBDCs (Boar and Wehrli, 2021). With the COVID-19 crisis, the decline of cash payments has accelerated, including in China (Figure 1). This could add to its CBDC success. And yet, a well-functioning CBDC will require a resilient, secure, and highly functioning new infrastructure, with the ability to onboard, authenticate, and support users on a massive and unprecedented scale (Allen et al., 2020). The oft-chosen retail model is a hybrid one in which the CBDC is a direct cash-like claim on the central bank, but where the private sector handles customer-facing activity (see Box 1).

Figure 1: China and US Broad Money Growth



Source: World Bank and Asia House Research

The COVID-19 pandemic may have accelerated CBDC development. In the US, early versions of congressional bills for the fiscal stimulus in response to the crisis included references to a digital dollar as a means of quickly executing government-to-person payments, as an alternative to credit transfers and slow and costly cheques (Brett, 2020).

The US Federal Reserve has ongoing research on retail CBDCs (Brainard, 2020a, b) underscoring the need for a crisis-proof backup to private money during future pandemics and crises, akin to situating digital currencies as a public good (DNB, 2020; Pichler et al, 2020).

CBDCs are likely to have international impact, though their stability effects are unclear. Experiments have demonstrated the technical feasibility of building links between national CBDC systems (they can be interoperable) yet setting up real links involves ensuring scalable, secure and resilient operating infrastructure with multiple stakeholders and participants that multiply with each CBDC (Auer et al, 2021). In the absence of coordination and oversight, CBDCs could provoke unintended international spillovers. They have been found to transmit international shocks, the magnitude of which depends on their design and that can be dampened with specific technical features, such as the CBDC’s remuneration rate (Ferrari et al., 2020).

The digital renminbi, or the Digital Currency and Electronic Payment (DCEP) project, is likely to reshape China’s domestic economy (and particularly apps such as Apple Pay and WeChat Pay). Given model predictions of international spillover impacts when non-residents hold a CBDC, the faster development of the DCEP suggests that China is likely to have a first mover advantage compared to other economies that will follow with issuing their CBDCs (ibid).

This paper maps out the pathways through which the digital renminbi is likely to impact China’s domestic economy, catalyse international spillovers, and alter the global position of the dollar in cross-border trade and investment.

## BOX 1: CBDC ARCHITECTURE AND TECHNICAL DESIGN

CBDC research is in its infancy, with limited testing at scale to date. Cash and digital currencies are typically token based while reserve accounts and commercial bank money are account based. There are four main CBDC architectures which are, in part, distinguished by the degree of central bank involvement.

Most central banks that are piloting or researching CBDCs fall into two categories (Auer and Böhme, 2020): Direct CBDCs and Hybrid CBDCs. The former is directly operated by the central bank and constitutes a direct claim on it. A central bank ledger tracks all CBDC transactions. Hybrid CBDCs constitute a direct claim on the central bank where a ledger of all transactions is kept. Intermediaries operate the retail side of the payment system and the central bank operates a backup infrastructure.

Less employed models are: intermediated CBDCs (similar to hybrid CBDCs, but the central bank maintains a wholesale ledger, rather than a full ledger) and retail CBDCs (which function directly through financial intermediaries where the consumer does not directly access central bank money). Finally, indirect/synthetic CBDCs are operated by intermediaries and constitute a direct claim on the intermediaries themselves.

CBDC technology itself can be based on a centralised database or on distributed ledger technology (DLT)\*. CBDC access is typically based on account identification rather than fully anonymous access (Calle and Eidan, 2020). Central banks experimenting with DLT use permissioned variants, in which the operator decides who is admitted to the network, in contrast with permission-less DLT technologies within private cryptocurrencies (Bech and Garratt, 2017).

\* Distributed ledger technology refers to the infrastructure that allows computers in different locations to propose and validate transactions and update records in a synchronised manner across a network. In a traditional distributed database, an administrator typically performs the key functions that are necessary to maintain consistency. By contrast, the new systems based on DLT are designed to function without a centralised authority. Transactions are conducted in a peer-to-peer fashion and broadcast to the entire set of participants who work to validate them in batches known as “blocks”. Since the ledger of activity is organised into separate but connected blocks, this type of DLT is often referred to as “blockchain technology” (BIS 2017).

## 2. THE RENMINBI'S GROWING DOMINANCE

Among current CBDC projects, the People's Bank of China's digital currency is comparatively advanced. Work started in 2014, and on 20 April 2020, the PBOC confirmed pilot testing was underway for a retail CBDC – the state-controlled DCEP – in several cities including Shenzhen, Suzhou, Chengdu and Xiong'an (Cheng, 2020). China's CBDC is set to be both important and disruptive, due both to its domestic and global implications; it could ultimately be the means through which the renminbi challenges US dollar dominance.

This section assesses the channels through which the DCEP, and its cumulative economic impacts, could bolster the renminbi to a position where it is treated as a global reserve currency, in equal measure to the US dollar.

### 2.1. Renminbi's share of global reserves: small but rising

China's economic developments suggest that the renminbi will increase as a store of value. The US dollar still enjoys its exorbitant privilege (Eichengreen, 2011)

in currency markets. It outstrips all other currencies in international foreign-exchange reserve holdings and in cross-border transactions, according to the International Monetary Fund (IMF). And yet, China is likely to surpass the US to become the world's largest economy, potentially by 2028 (Reuters, 2020). Additionally, the renminbi has increased its share of global trade and cross-border investments, fueling a step change in renminbi holdings despite its overall share being small (two per cent) compared to the US dollar (56 per cent) and the euro (19 per cent).<sup>1</sup>

The DCEP could contribute to China's financial system stability, which would bolster the renminbi's credibility as a store of value, too. It would do so by creating an additional payment system alongside China's private sector payment systems. This will diversify China's payment systems currently dominated by Alipay and WeChat Pay, which control 94 per cent of China's mobile payments market (Reuters, 2021; Kang, 2020). DCEP is not in direct competition with existing private payment systems, or digital wallets (Feng and Borak, 2020). It would add breadth to the usage of (consumer) data held by China's domestic technology firms, reducing financial system risks. The DCEP itself has the defining characteristics of a hybrid currency (Box 2).

## BOX 2: THE DIGITAL RENMINBI IN CONTEXT

As a hybrid digital currency, the DCEP is a direct claim on the PBOC and is accessible through mobile phones or cards. The PBOC provides and controls the core infrastructure, while intermediaries such as commercial banks, other payment service providers and telecoms would provide services to the public, according to PBOC deputy governor, Fan Yifei (Tang, 2020). Onboarding and real-time payment services are operated by intermediaries that conduct know-your-customer checks. Under the central bank's direction, the six biggest commercial banks that are all government-owned\* will distribute DCEP to smaller banks and to app providers Alipay and WeChat, which are expected to manage sender-recipient interactions (Jiang and Lucero, 2021).

The PBOC has stated that distributed ledger technology (DLT) is not yet sufficiently mature to accommodate the 300,000 transactions per second commensurate with large retail transactions in China. The PBOC has decided to use a value-based, semi-account-based and account-based hybrid payment instrument (BIS 2021). Identity is based on loosely coupled account links, indicating that users could use DCEP anonymously with counterparts in daily transactions, but operating agencies would submit transaction data to the PBOC via asynchronous transmission, ensuring that users remain anonymous to each other but would allow the central bank to track data for regulation, supervision, fraud and money laundering (ibid).

\* These are the Industrial and Commercial Bank of China, Agricultural Bank of China, Bank of China, China Construction Bank, Bank of Communications and the Postal Savings Bank of China.

### 2.2. Liberalisation will boost the digital renminbi's global footprint

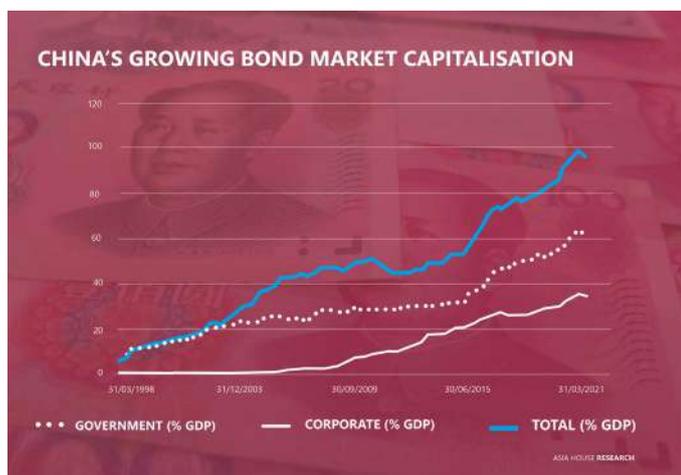
China's CBDC seems to be primarily designed for domestic retail payments. And yet, the DCEP technology could help promote the renminbi internationally (Huang, 2020; Peters et al., 2020) and, in time, it is expected to facilitate trade settlements (Kynge and Yu, 2021). To the degree that a digital renminbi would enable state control over domestic and foreign corporations, there would be geopolitical pushback. This control could stem from its design as a centralised digital bank note (a central bank asset) being transacted from user to user, even enabling the government to export its influence abroad (Fanusie and Jin, 2021). This would exacerbate existing economic tensions between China and its major trading partners and would trigger a more hawkish US stance from the Biden administration. Inevitably, efforts at dollar digitalisation would continue. And in the event of confrontation, the US could, for example, insist that SWIFT<sup>2</sup> complies with its sanctions, which would disrupt renminbi-denominated transactions.

The economic conditions for any currency to gain global reserve status are well established (Eichengreen 2005, 2011). For the renminbi to be a strong and stable store of value that would challenge the US dollar, or the euro, there would be the following pre-conditions. We examine them here and then assess whether digitalisation could expedite this process.

**China needs a larger, liquid and liberalised bond market.** At roughly 98 per cent of GDP, China's bond issuance is still approximately half of the US's bond market capitalisation. In light of this, the renminbi needs to be supported by the further opening of its domestic bond market to foreign investors, and the general liberalisation of its capital account, which has been slow (Hale and Lockett, 2021). Core to this is a freely convertible renminbi if the PBOC wants to maintain an independent monetary policy, given the impossible trinity<sup>3</sup> faced by policymakers. The DCEP could expedite a market-driven process where China's bond market has the breadth, depth and scale for the renminbi to be chosen over the US dollar to fund and price assets (Cruz et. al., 2015). It could help fuel private issuance in its government-dominated market (Figure 2) (EIB 2021; BIS, 2018; Endo, 2008).

**Asia's growing ecosystem of currency digitalisation could support the DCEP.** CBDC distribution requires a particular type of regional ecosystem to be successful. The PBOC continues to advance, expand and develop its DCEP technology, as other central banks engage in ongoing debate around CBDC benefits (Hasenstab, 2021). Although the primary aim for DCEP is domestic retail use, if an understanding can be reached with foreign jurisdictions, non-residents could access the DCEP with a foreign mobile number for an entry-level wallet. The PBOC would comply with relevant AML/CFT<sup>4</sup> rules and has joined an initiative to develop protocols for the cross-border use of digital currencies, working with the BIS, the central banks of Hong Kong, Thailand and the United Arab Emirates.<sup>5</sup>

Figure 2: China's Growing Bond Market Capitalisation



Source: Asian Development Bank

### Renminbi needs to be predicated on China's growing global trade share.

If the PBOC captures first-mover advantage to meet the world's demand for digital currencies, to settle international financial transactions and to own digital assets, the appeal of the DCEP could rise significantly. Model-based predictions suggest that China could have a first mover advantage when it comes to leading in digital currencies; this would depend, in part, on the design of the CBDC and the degree to which it is remunerated (Ferrari et al., 2020). This could contribute to China's growing global share of imports and exports. China has started to surpass the US in terms of its global export and import shares (Figure 3). What's more, more widespread regional use of its digital currency could facilitate network externalities in China's growing trading relationships, seeing it become increasingly integral to the broader Asian economy.

Figure 3: China and US Global Import and Export Share



Source: World Bank and Asia House Research. Export and import shares are calculated as a percentage of world exports and world imports and denote goods and services.

## 2.3. The geopolitical impact of China's currency digitalisation

Through financial sanctions, the US leverages the reserve currency status of the dollar to advance its foreign policy objectives, given that access to the US financial system is needed to settle dollar transactions (United States Congressional Research Service, 2020; Haas 1998). As a result, there has been a reduced willingness to hold dollars, in isolation from the growing use of the renminbi. Many foreign governments targeted by the US are increasingly creating ways to reduce dollar reliance through non-dollar contracts, currency swap lines, digital currencies, and non-dollar payment processing systems (ibid; McDowell, 2021, 2019). The digital yuan could give those countries, that the US seeks to penalise, an alternative.

Even limited international usage of the renminbi could challenge the ability of the US to impose sanctions, which have been a historical tool of choice; of late, they have been increasingly used against Chinese companies or individuals (White House, 2021; Toosi, 2021; Swanson, 2020). Any limit to the US's ability to employ this tool is considered a national security threat by US policymakers, especially given the decline in the credibility of the US in terms of managing sanctions during the Trump administration (Rosenberg et al., 2019). The ability of certain Asian countries, such as North Korea, to fund itself using digital yuan is a particular risk.<sup>6</sup> There is thus US concern about how the digital yuan could be used to circumvent US sanctions (Greenwald 2021; Blustein 2021).

The renminbi's resilience and strength are likely to be intimately tied to its geopolitical relationships – this has been a driver behind the US dollar and the pound sterling's reserve currency status in the past (Chey 2012; Schenk 2009). The geopolitical rationale for holding renminbi could continue to be strengthened through initiatives such as China's Belt and Road Initiative (Ly, 2020; Standard Chartered 2019). The COVID-19 crisis could also catalyse greater acceptance of the renminbi as a reserve currency, and a greater need for China as a provider of funding in the emerging and developing economies where resource gaps are large and hard-hit by multiple health, economic and climate shocks. China's progress in rolling out its CBDC could give it an advantage, presenting the prospect of a Chinese-led CBDC ecosystem in Southeast Asia.

### 3. THE RENMINBI'S TRANSMISSION PATHS IN ASIA

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A broader roll-out of DCEP is planned for the 2022 Beijing Winter Olympics. Crucially, its resilience and uptake will depend, in large part, on the regional ecosystem which develops around it. As other, less developed economies develop their own respective CBDCs, they could be reliant on and influenced by the PBOC model and payment system by virtue of China's economic presence in the region. The transmission paths could occur in the following ways:

- Highly informal economies are more likely to successfully adopt a CBDC and can have greater gains in digitalising their transactions (Oh and Zhang, 2020). A one standard deviation increase in informalisation in the economy has a 38 - 49 per cent probability of moving up in the BIS CBDC project index.<sup>7</sup>
- Countries with lower or uneven access to finance could have a greater fit with retail CBDCs as a financial inclusion policy (Foster et al., 2021). Financial inclusion through digitalisation is likely to be particularly effective for MSMEs in larger Southeast Asian economies such as Indonesia and the Philippines.
- High mobile phone usage is closely linked to CBDC development. A one standard deviation increase in mobile phone subscriptions is associated with a 55 – 63 per cent higher probability of moving from CBDC research to a pilot scheme (Auer et al., 2020). India and Indonesia are particularly relevant for this metric.
- Central banks with high innovative capacity can support a new CBDC ecosystem successfully. Typically, such central banks have a retail fast payment system (Bank of Thailand, 2021), artificial intelligence enhanced supervisory tools, and links with regulatory sandboxes.<sup>8</sup>

It may be some time before CBDCs, including China's, gain broad-based traction. Retail payment behaviour typically shows inertia and the introduction of more convenient payment methods does not always lead to a marked reduction in the cash share of payments, due, in part, to fees (Kumar and O'Brien, 2019; Arifovic et al., 2017). When behaviour does change, the uptake can be persistent. In this sense, changed payment behaviours caused by the COVID-19 crisis could have far-reaching effects.

### CONCLUSION

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CBDCs could constitute an indispensable future policy tool and channel for economic growth. China's CBDC is innovative and advanced in its development, compared to others. If some of the current trade and cross-border investment trends continue, the DCEP could help bolster the reserve currency status of the renminbi, particularly at the expense of the US dollar. And yet, there are preconditions to the DCEP's growing use, including further liberalisation efforts in China's financial markets and a freely convertible renminbi. Such a development will not come without risks, mainly in the context of the geopolitical rivalry between China and the US that is already disrupting trade and investment in Asia and beyond.

## NOTES

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1. Currency Composition of Official Foreign Exchange Reserves (COFER), IMF International Financial Statistics. Latest data are for the first quarter of 2021.
2. SWIFT denotes the Society for Worldwide Interbank Financial Telecommunications.
3. The policy trilemma around the ability to meet only two out of three policy objectives (global financial integration, exchange rate stability and monetary autonomy) continues to be well-established, particularly for emerging and developing economies (Aizenman, 2010).
4. Anti-Money Laundering/Combating the Financing of Terrorism controls.
5. <https://www.bis.org/press/p210223.htm>
6. A wargaming simulation of a White House National Security Council meeting examining the impact of digital currency wars, was held at Harvard University demonstrating the ability of the digital renminbi to circumvent US sanctions during a national security crisis.
7. The BIS CBDC project index (CBDCPI) is higher in jurisdictions with higher mobile phone usage and higher innovation capacity (Auer et al., 2020).
8. Policymakers are creating regulatory sandboxes to foster financial sector innovation and access to capital. The UK Financial Conduct Authority pioneered the first regulatory sandbox in 2015 (Cornelli et al., 2020).

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