



# China Economic Quarterly Q2 2022

The progress of digital yuan and  
internationalisation of the Chinese currency



# The progress of digital yuan and internationalisation of the Chinese currency

The digital yuan, also known as e-CNY, has made remarkable progress since its pilot scheme launch in May 2020. China continues to expand the scope of its pilot tests and explore applications of the domestically-invented Digital Currency and Electronic Payment (DCEP) network. According to the People's Bank of China (PBoC), the tests have extended to 21 regions in 15 provinces and cities, including

municipalities directly under the Central Government such as Beijing and Shanghai. As of 31 May 2022, 264 million transactions with a total value of 83 billion yuan have taken place through the country's digital yuan payment system. 4.57 million merchants and stores now accept payments using this digital currency.

At a recent press conference, a PBoC official shared their intention to

deepen international exchange and co-operation on the digital yuan, while ramping up the scope of the pilot projects and its use cases. As a sequel to PwC's report, "**The business implications of China's digital RMB**", this report will review the progress made in the past two years and examine the potential path to internationalisation for China's digital currency, as well as its implications for the business sector.

**Figure 1: Three pilot compositions of digital yuan**

Pilot composition	Date	New areas	Total
Phase I	Aug 2019	Shenzhen, Suzhou, Xiongan, Chengdu, Winter Olympic Scenes	4+1
Phase II	Oct 2020	Shanghai, Hainan, Changsha, Xi'an, Qingdao, Dalian	10+1
Phase III	Mar 2022	Tianjin, Zhejiang(Hangzhou, Ningbo, Wenzhou, Huzhou, Shaoxing, Jinhua), Fujian(Fuzhou, Xiamen), Guangzhou, Chongqing	21+1

## A major breakthrough: The launch of the digital yuan app

The launch of the digital yuan wallet was a major breakthrough for the development and promotion of China's digital currency. In an earlier phase of the pilot tests in 2020, the digital yuan wallet was incorporated into mobile banking apps while remaining separate from the traditional bank account. Users could easily open a digital yuan account within their mobile banking app. On January 4 2022, the first pilot digital yuan app was officially launched on major app stores, including Huawei and Apple.

Screen shots of e-CNY (Pilot Version) app on Huawei and Apple's App Store



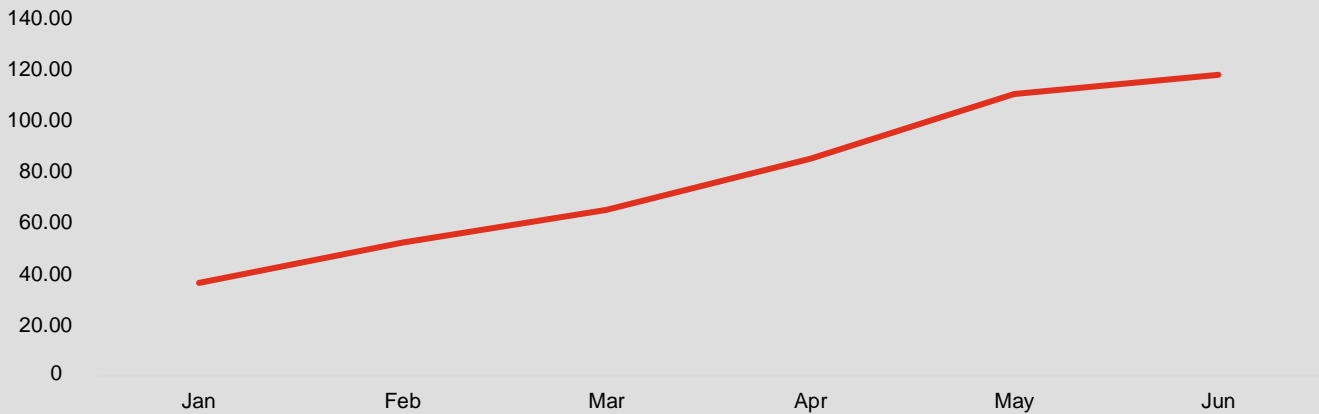
Source: e-CNY App, PBoC; Huawei and Apple app store

The pilot e-CNY app is the official service platform of China's digital legal tender for individual users. It enables the opening and management of a

personal digital yuan wallet, as well as the exchange and circulation of digital yuan. Users can register to use the digital yuan on the e-CNY app.

Research and development trials of the digital currency will be carried out in pilot zones for specific use cases.

**Figure 2: Cumulative downloads of the e-CNY app (Pilot Version), from January to June 2022 (Unit: millions)**

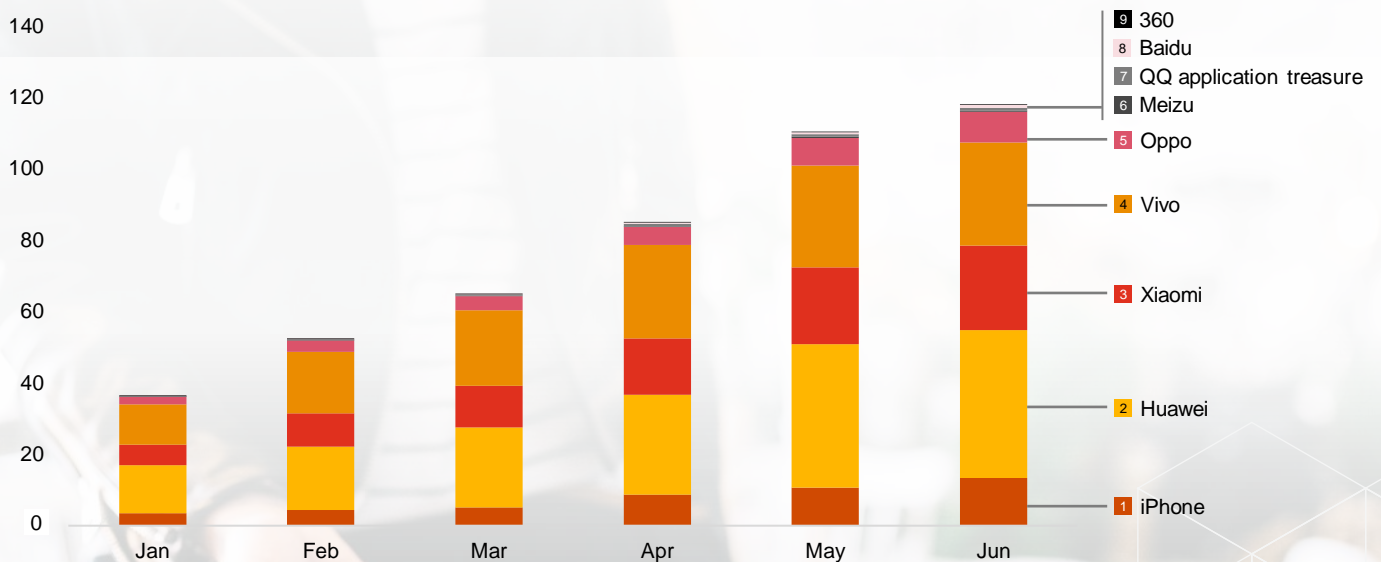


Source: Qimai (estimated data)

The number of e-CNY app downloads through Huawei's app store reached 41.88 million by mid-July. The estimated number of e-CNY app

downloads from other app stores such as Xiaomi, Vivo, and Apple almost reached 118 million by the end of June.

**Figure 3: Cumulative downloads of the e-CNY app (Pilot Version), from January to June 2022 (Unit: millions)**



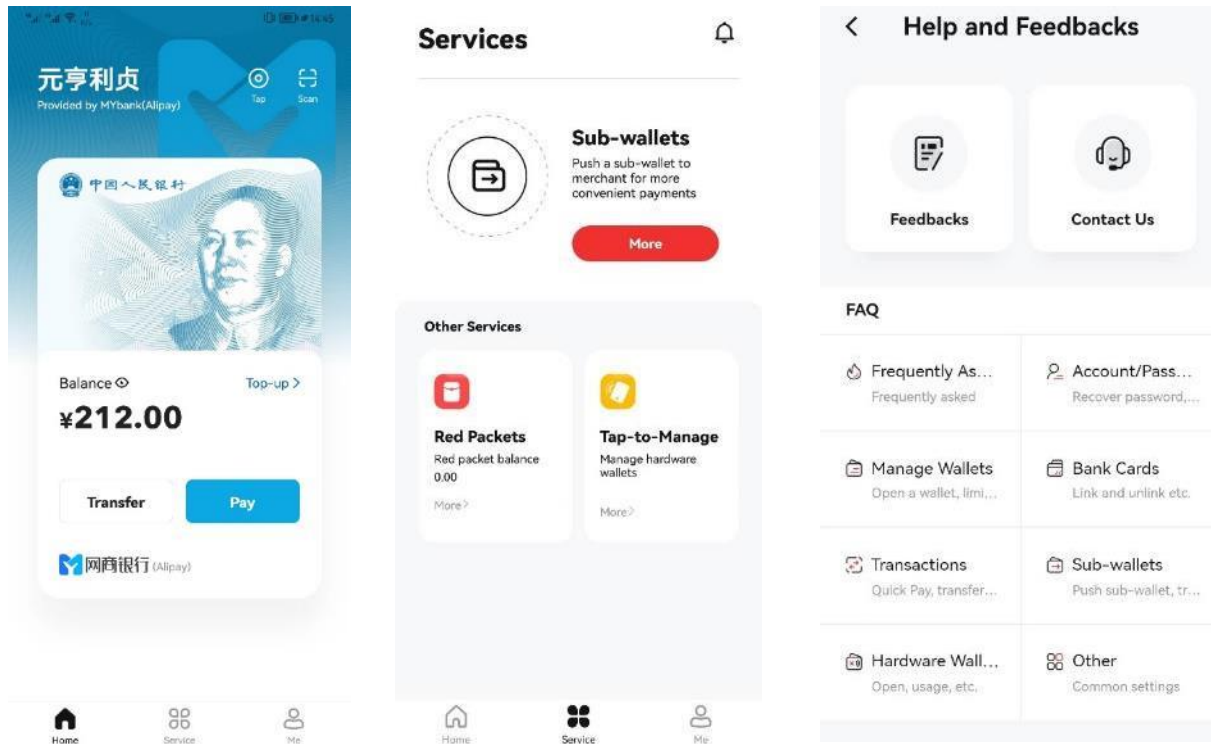
Source: Qimai (estimated data)



Comparatively, the number of downloads, including updates, for two of the country's most popular apps, WeChat and Alipay, from Huawei app store reached 14.9 and 13.7 billion respectively. According to Tencent's earnings report for the first quarter of

2022, as of 31 March, the number of monthly active WeChat users, for both the international and Chinese versions, reached 1.29 billion. In January 2021, Alipay announced that the number of users of its app exceeded 1 billion.

Research and development trials of the digital currency will be carried out in pilot zones for specific use cases. While the digital yuan is still in its pilot phase, its growth and development will be a long journey, but with the potential to serve as a major infrastructure platform.



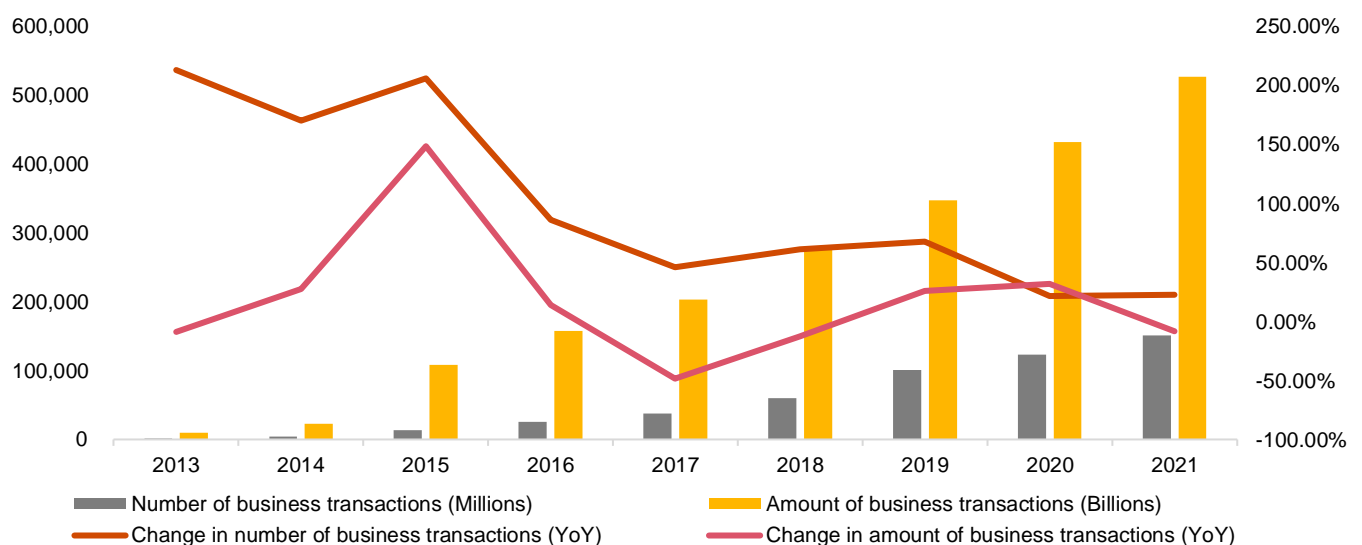
Source: G. Bin Zhao's e-CNY wallet from e-CNY app; PBoC

Although only 264 million cumulative transactions with a total value of 83 billion yuan took place through the e-

CNY app by the end of May, the total number of transactions and value of non-cash mobile payments reached 151

billion and 527 billion yuan, respectively, in 2021.

Figure 4: Non-cash mobile payment scale from 2013 to 2021



Source: Wind

## ■ Digital yuan apps enable international access

There are four types of digital yuan wallets available, either through the e-

CNY app or a bank app. The types of wallet are classified and managed

according to the degree of user identification required.

	Type one	Type two	Type three	Type four
Opening requirements	In person on mobile phone, ID, bank account, at an authorised bank branch	remote to open with mobile phone #, ID, and a domestic bank account	remote to open with mobile phone # and ID	remote to open with mobile phone #
Account opening location	In person	Remote	Remote	Remote
Mobile phone number required?	Yes	Yes	Yes	Yes
Documentation requirement	ID needed	ID needed	ID needed	N/A
Bank account requirement	Bank account at an authorised branch	Domestic bank account	N/A	N/A
Degree of of user identification required	Very high	High	Low	Very low
Single payment limit (yuan)	20,000	20,000	5,000	2,000
Daily payment limit (yuan)	50,000	20,000	10,000	5,000
Annual balance limit (¥)	No limit	500,000	200,000	100,000

Source: e-CNY app, PBoC



### Type one

The most stringent identification requirement with minor transaction restrictions bank account and digital yuan app are linked.



### Type two

Remote opening with a high identification requirement; bank account and e-CNY app are linked.



### Type three

Minimal identification requirements.



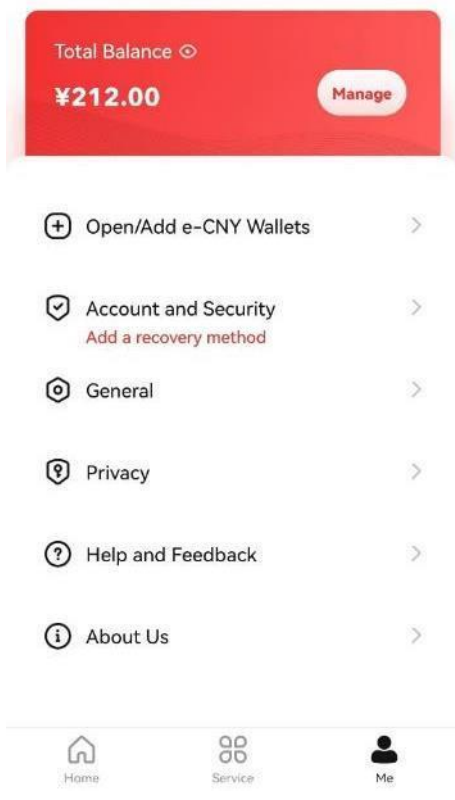
### Type four

A wallet with high degree of anonymity, albeit, limited.

Since the PBoC does not specify the need for a domestic ID or mobile phone number for digital wallet type three, and only mobile phone number for type four, international tourists and foreigners would be qualified to open those wallets. With an annual balance limit of 200,000 yuan (approximately 30,000 US dollars) and 100,000 yuan for the type three and type four wallets respectively, and single payment limit and daily payment limit of 2,000 to 10,000 yuan, both types would meet their basic needs.

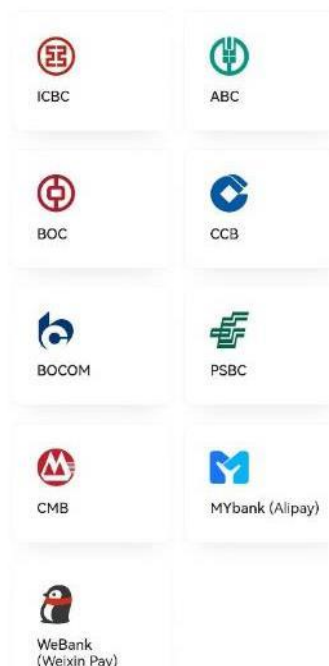
As of mid-July, authorised operators to facilitate the opening of an e-CNY wallet include:

- Industrial and Commercial Bank of China (ICBC)
- Agricultural Bank of China (ABC)
- Bank of China (BoC)
- China Construction Bank (CCB)
- Bank of Communications, (BOCOM)
- Postal Savings Bank of China, (PSBC)
- China Merchants Bank (CMB)
- MYBank (Alipay)
- WeBank (Weixin Pay)



### Open an e-CNY wallet

Choose an authorized operator and open an e-CNY wallet



Source: G. Bin Zhao's e-CNY wallet from e-CNY app, PBoC



Source: Chinanews.com

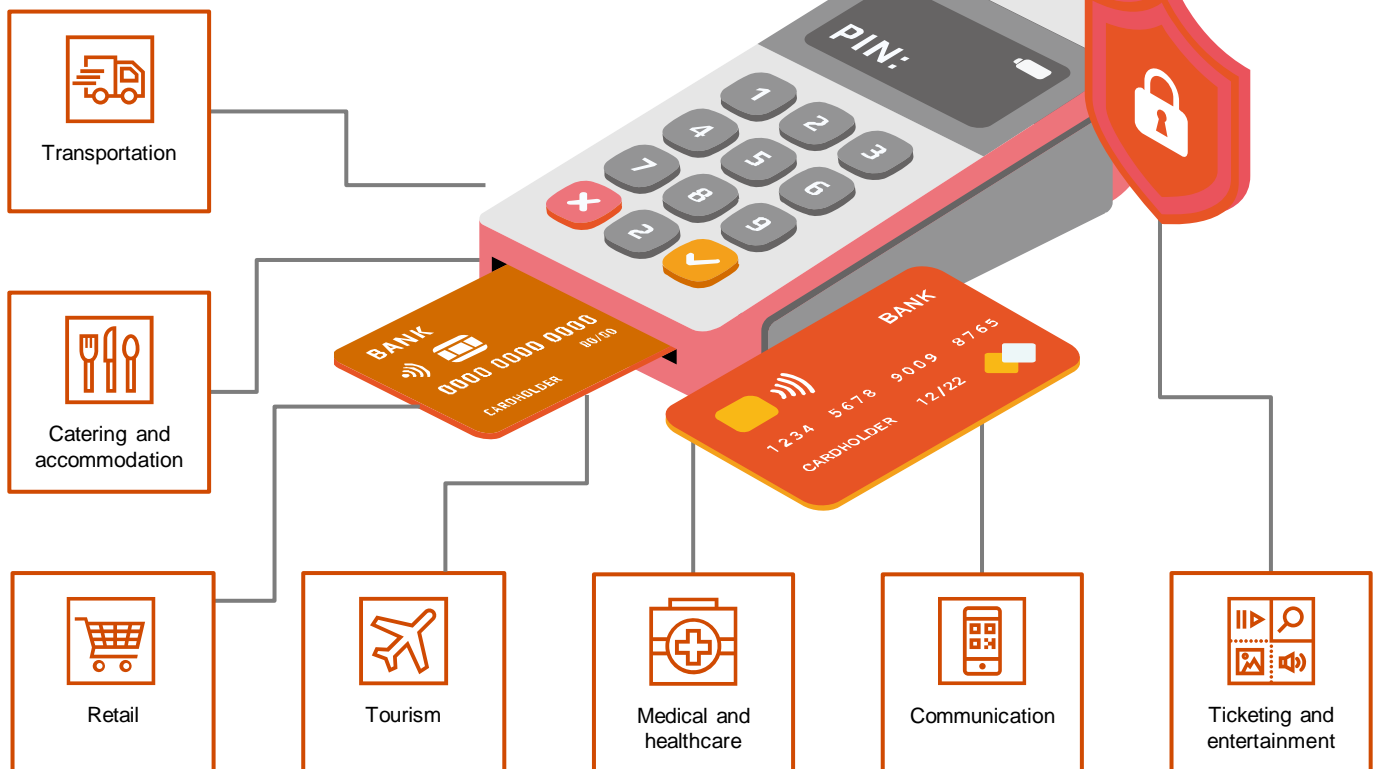
Subject to the purpose, a personal or business digital wallet can be opened. In addition, a soft wallet or a hard wallet is available based on the carrier. Within the main wallet, there is also the option to create sub-wallets with different permissions. The limit on the digital wallet is dependent on its handling requirements .

Hard wallets (see above pictures) include a physical card, bracelets, among other forms, which can be obtained and used anonymously, within limits. It is safe, convenient and provides complete protection for the user's personal privacy, meeting user demand for small and anonymous payment methods .

During the Beijing 2022 Winter Olympics, digital yuan was introduced to the world. The world's top athletes and their associates, including coaches and judges, were among the first to experience the digital yuan payment system. Its new use for cross-border payments during the Olympics also accelerated the globalisation of the digital yuan.

The digital yuan pilot during the Olympics covered seven services including :

With an eye towards future coverage, the Beijing Olympics also piloted the digital currency's use in innovative scenarios, such as: self-driving vehicles; self-service machines; unmanned supermarkets; and wearable payment devices that included gloves, badges and Winter Olympic apparel. To facilitate overseas visitors, app-based wallet service and hardware-based wallet service were also launched.



## ■ Digital yuan will help drive RMB internationalisation

The internationalisation of the Chinese yuan has gained traction in recent years and the launch of the digital yuan and the accompanying e-CNY app is likely to push this agenda forward. As recently indicated by the PBoC, China will deepen international exchange and co-operation around the digital yuan. In fact, there are a few reasons why China might employ the digital currency to speed up globalisation of the Chinese yuan.

### 1 China strives to become a global leader for the digital economy and a globalised digital yuan would be an influential factor.

The digital yuan would potentially serve as a symbol of digital economic leadership and, the much-needed, global public infrastructure to facilitate digital economic growth.

Globalisation was originally driven by the industrial economy and emergence of multinational corporations. As the world ushers in a digital era, data flow will

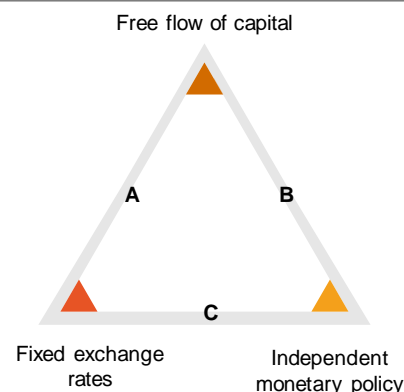
become increasingly more critical than flow of goods. Therefore, digital currency will likely play a game-changing role in global public infrastructure. China already has the first mover advantage by launching its digital currency and establishing a nearly cashless economy. If the digital yuan goes global, it will not only further the internationalisation of the Chinese economy and its companies and boost the development of the Belt and Road Initiative, but it will also cement China's status as the world's second largest economy.

### 2 The initial globalisation of the digital yuan would serve as a trial of the internationalisation of the Chinese currency.

The Chinese yuan is still not freely convertible and the country's capital account are not freely open.

As described by the Mundell-Fleming model (Robert Mundell and Marcus Fleming, 1976), an economy cannot simultaneously maintain a fixed exchange rate, free capital movement, and an independent monetary policy. However, the marketisation of China's exchange rate has improved while capital control has been gradually relaxed in recent years.

Figure 5: Mundell-Fleming trilemma model

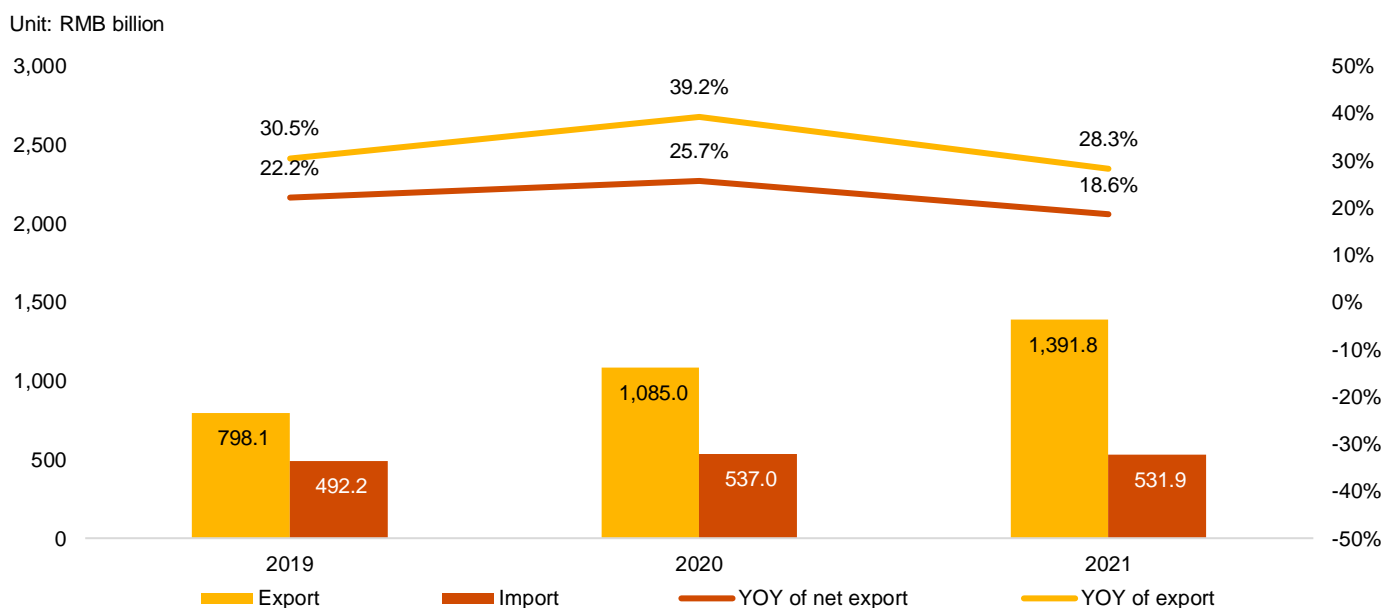


Source: Robert Mundell and Marcus Fleming 1976.

Since the digital yuan and its wallet can easily be traced and managed, the risk of allowing freely convertible digital yuan and liberalising capital accounts control for some digital accounts is much lower. While further research and studies would need to be conducted, in theory, it is not complicated.

Digital yuan can flow easier across borders as there is no requirement for domestic identifiers, i.e. ID or mobile number, to open digital wallet types three and four. Hard wallets, including physical cards and bracelets, could change hands between anonymous owners including foreigners and residents in other countries.

Figure 6: Import and export of cross-border e-commerce from 2019 to 2021



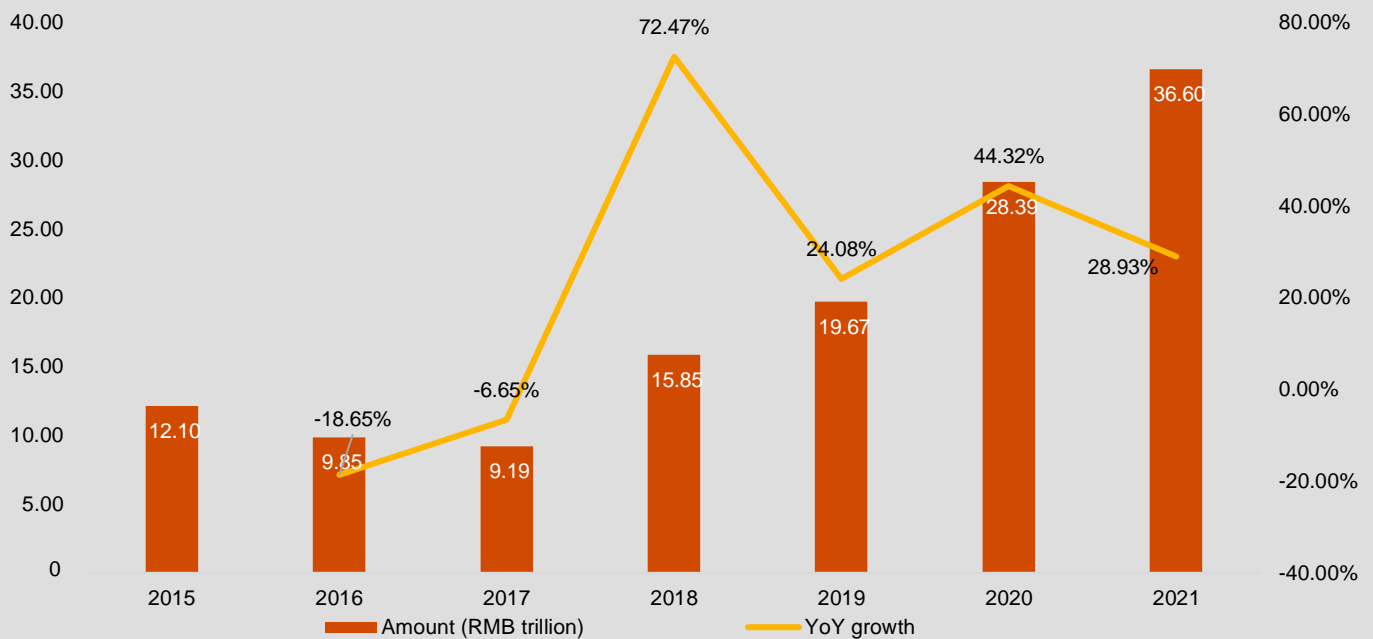
Source: General Administration of Customs, China

Cross-border e-commerce in China increased by 15% YoY and reached 1.98tn yuan in 2021, albeit, the volume is significantly less than import and export in 2021, 39.10 trillion yuan, or

6.05 trillion US dollars. The introduction of the digital yuan payment system on these e-commerce platforms would further boost transaction volume. In the past few months, an increasing number

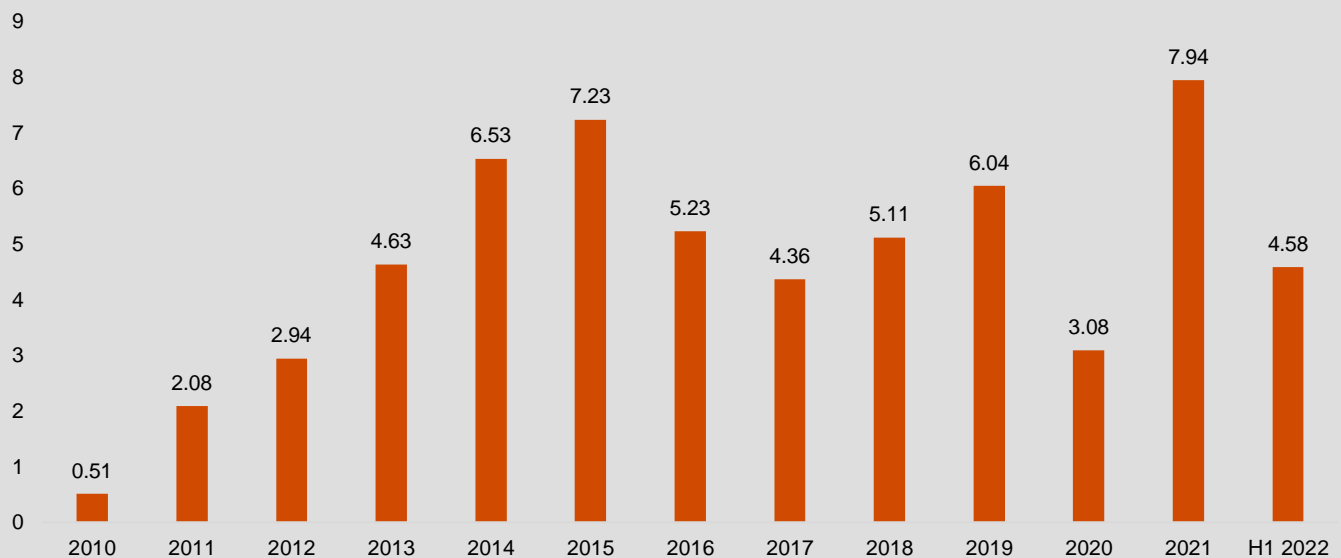
of domestic e-commerce merchants have enabled digital yuan as a payment option, so consumers can choose to shop with the digital currency and pay through their e-CNY app or wallet.

**Figure 7: Amount of cross-border RMB payments and receipts from 2015 to 2021**



Source: Wind (PBoC); YoY data calculated by PwC

**Figure 8: Amount of cross-border trade RMB settlement from 2010 to Jun 2022 (Unit: RMB trillion)**



Source: Wind (PBoC)



More specifically, according to the PBoC, cross-border yuan receipts and payments totalled 36.6 trillion yuan last year, a 29.0% YoY increase, despite COVID-19 and slower economic growth. This was the result of local governments promoting innovation among cross-border yuan businesses and the opening up of China's financial sector. In the first half of 2021, yuan cross-border receipts and payments reached 17.57 trillion yuan, accounting for 48.2% of China's total cross-border receipts and payments in the same period, up 2.4% from the first half of the previous year. The volume of yuan settlements for cross-border trade also increased from 0.51 trillion in 2010 to 7.94 trillion yuan in 2021.

Financial Telecommunication) system aggressively used as a strategic tool to enforce financial sanctions on Russia, China and many countries were alerted to the potential of similar sanctions deployed against them in the event of future conflicts.

First, the manual clearing process of the SWIFT system means that settlement usually takes two to three days, and at times up to a week. Second, cross-border payments in the system involves too many parties, resulting in high transaction costs. Clearing institutions, agent banks and correspondent banks, not to mention the SWIFT system itself, all charge a commission, or handling fees, for each transaction. Third, the SWIFT system can be vulnerable to hacker attacks, which raises concerns over payment security.

However, the SWIFT system has been accepted globally for a several decades, and as with many countries, China also relies on the system for cross-border payment, and will likely continue to do so for a long time. The proportion of global payments made with the Chinese yuan has also substantially increased in the last ten years, according to SWIFT data.

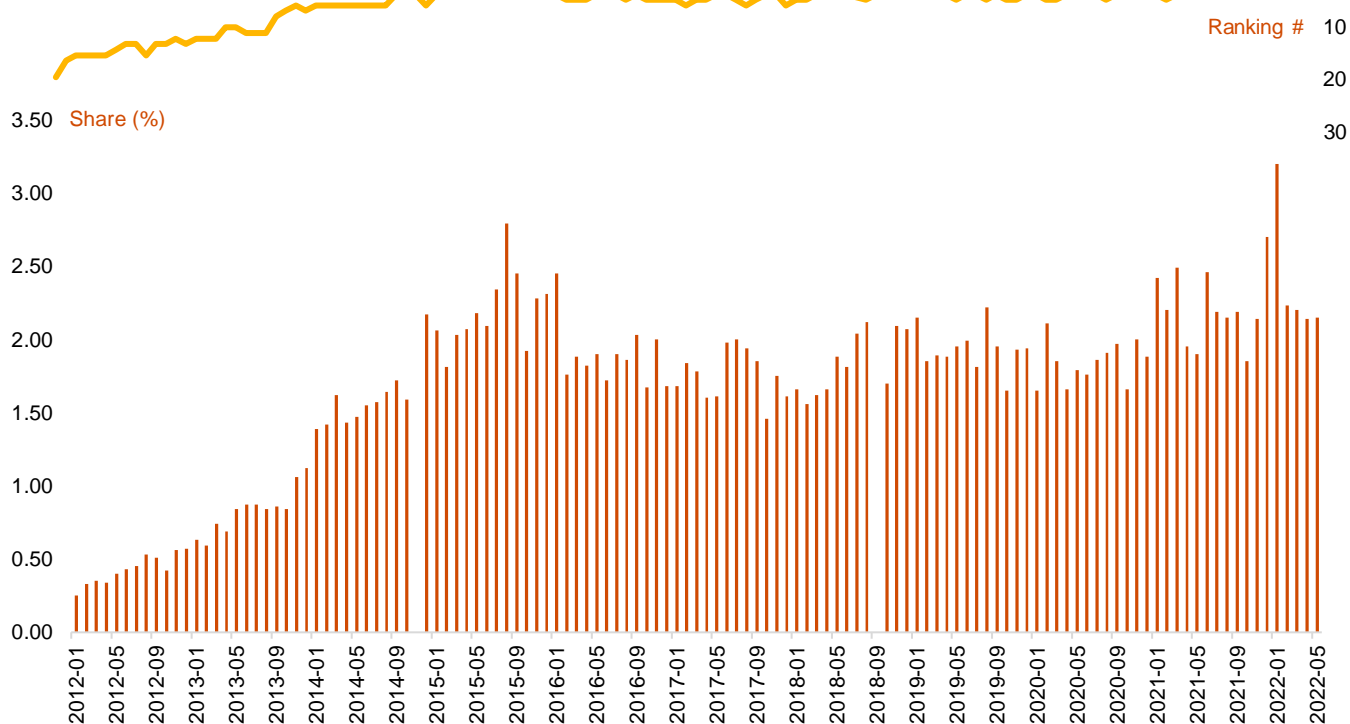
### ■ Will the digital yuan give way to a Chinese equivalent of the SWIFT system?

### 3 Escalating geopolitical tensions and international financial sanctions against Russia will prompt China to view the digital yuan strategically.

According to research from the Chinese Academy of Social Sciences (CASS) there are three reasons that the SWIFT payment system is far from meeting the growing requirements of international financial and trade businesses, not to mention the rapid development of the digital economy (Guoping Huang, 2022).

The digital yuan is likely to play a major role in the expansion of China's independent payment system. With the SWIFT (Society for Worldwide Interbank

Figure 9: RMB's share as a global payments currency from Jan 2012 to May 2022



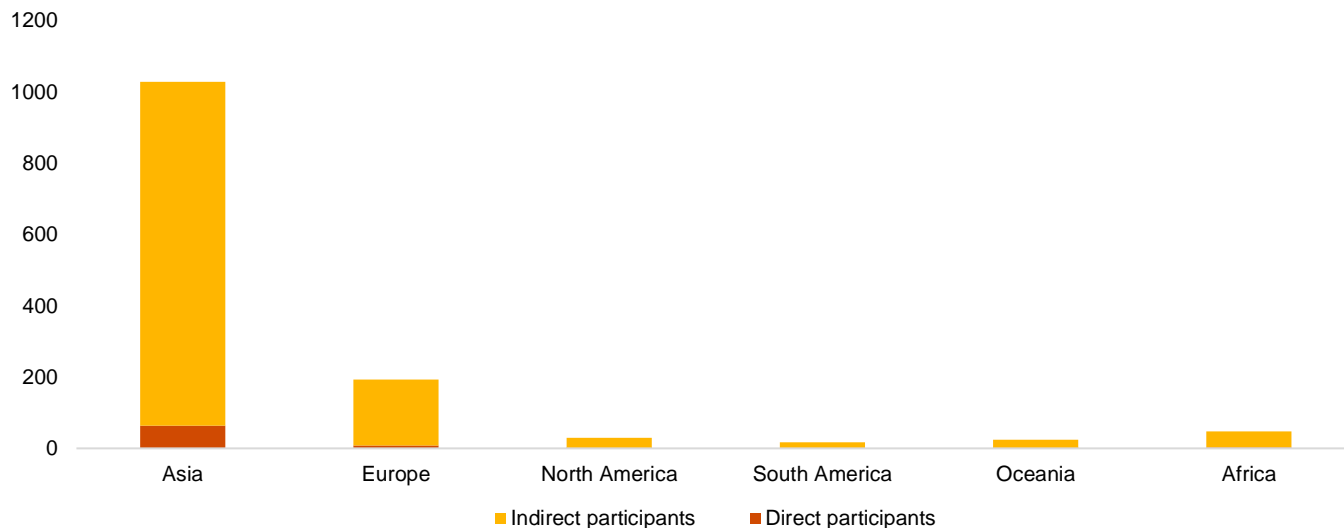
Source: Wind (SWIFT)

With this, CASS emphasised the necessity to reconstruct and rebuild the cross-border payment and international settlement infrastructure to improve the efficiency and protect China's national and financial security. Therefore, in the

long-term, China should speed up the development of a yuan dominated international payment system, with the digital yuan playing an increasingly prominent role. Consequently, China will strengthen its SWIFT-equivalent

system, the Cross-border Interbank Payment System (CIPS). CIPS is an independent international yuan payment and clearing system connecting both onshore and offshore clearing markets and participating banks.

**Figure 10: Cross-border Interbank Payment System participants by location**



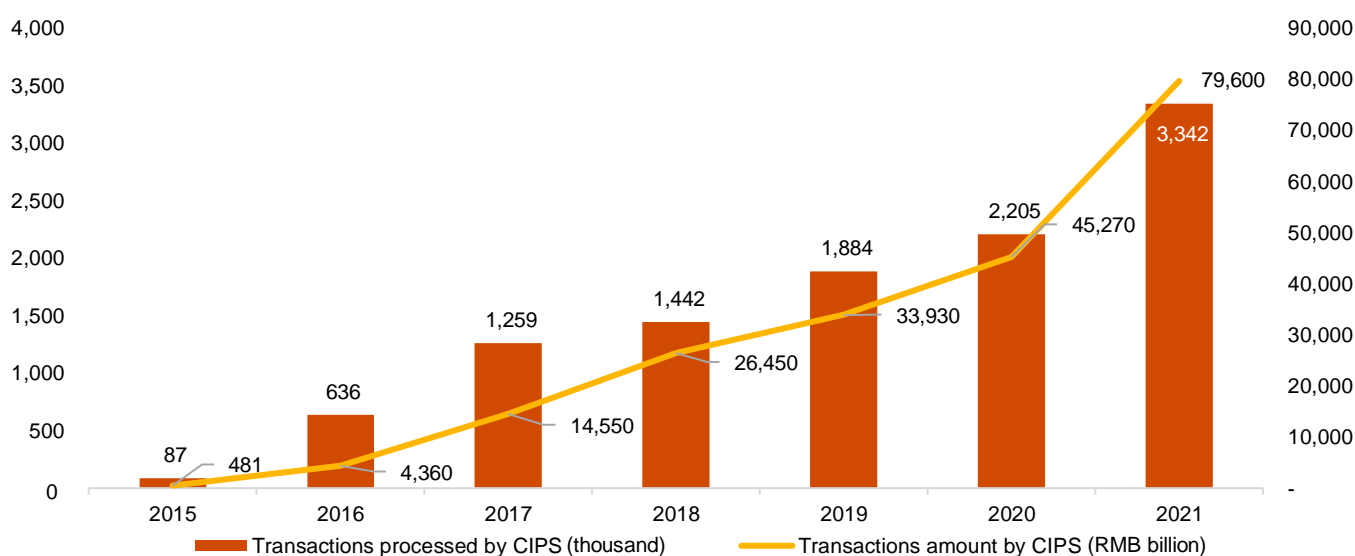
Source: CIPS

Launched in October 2015 and specialising in the wholesale payment component in the cross-border yuan payment and clearing business, CIPS developed rapidly in the past few years. In 2021, CIPS processed a total of 79.6 trillion yuan in payments, with daily

transactions and value showing double-digit growth despite the pandemic. There are 1,341 financial institutions that directly or indirectly participate in CIPS, covering over 100 countries and regions, essentially meeting the demand for cross-border yuan

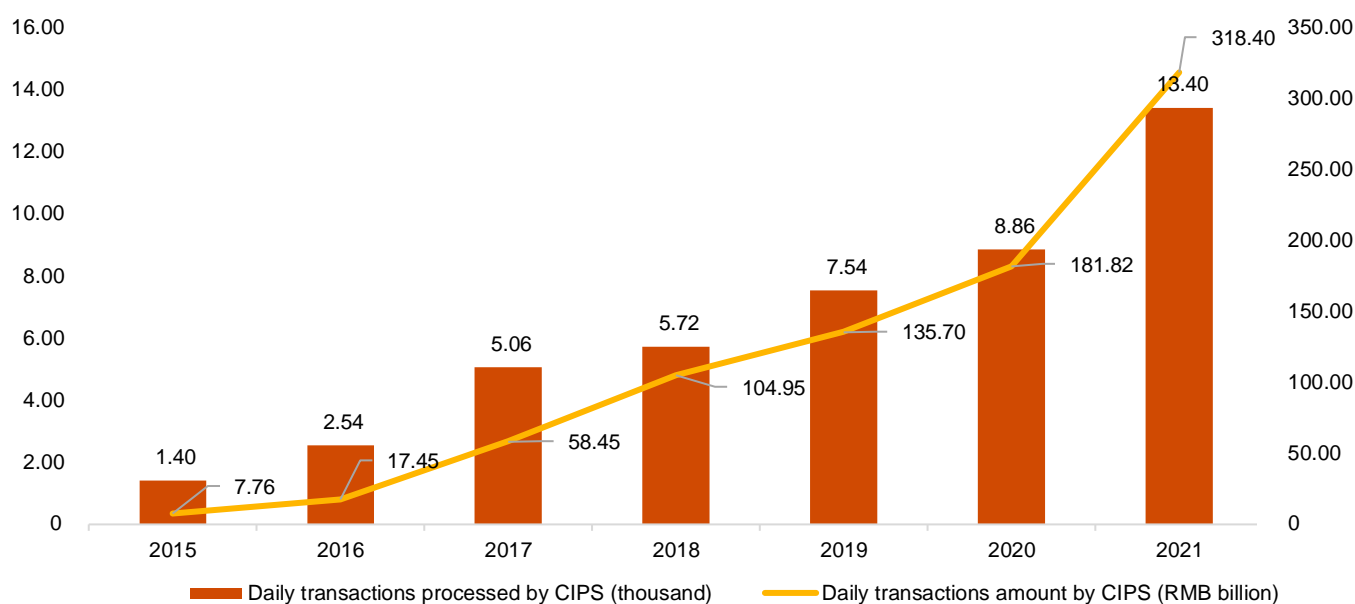
settlements in major time zones. Yet, CIPS is still dominated by indirect participants, mostly based in Asia, and the transaction amount and value is much smaller when compared to SWIFT.

**Figure 11: Yearly transactions of Cross-border Interbank Payment System from 2015 to 2021**



Source: Wind (PBoC)

**Figure 12: Daily average transactions of Cross-border Interbank Payment System from 2015 to 2021**



Source: Wind (PBoC)

**Figure 13: CIPS business type profile (2021)**

Business type	No. of transaction (Unit: thousands)	YoY	Amount (Unit: RMB billion)	YoY
Customer remittance	2,647	56.2%	1.42	81.5%
Financial institutions remittance	622	37.5%	5.89	80.3%
Bilateral business in financial markets	72	25.4%	0.65	36.0%
Clearing agency lending business	1	175.2%	0.00	-12.5%
<b>Total</b>	<b>3,342</b>	<b>51.6%</b>	<b>7.96</b>	<b>75.8%</b>

Lastly, it is not clear whether the digital yuan, as a type of DCEP, can directly boost CIPS. The cross-border use of the digital yuan is still in the exploratory stage, while the technology and problems involved are relatively complex. Therefore, it might be a difficult and lengthy process for it to enter the application stage. At the

current stage, internationalisation of the Chinese yuan can be sped up through optimisations to the technology, functions and platform of the digital yuan and improvements to the cross-border payment and settlement system with CIPS as the core. At the same time, CASS suggested that China should strengthen its exploration and

experimentation of digital currencies in cross-border payments, laying a solid foundation for the widespread use of digital yuan.



## ■ What are the business implications?

This year, the development of the digital yuan has seen dramatic progress, especially with the launch of the e-CNY app and the first international demonstration during the Beijing 2022 Winter Olympics Games in February. The domestic business sector also embraced it swiftly with great enthusiasm.

In particular, the financial industry, including wealth management, loan and insurance services, has accepted and applied the digital yuan since the beginning of this year. Within the industry, digital yuan loans and credit cover a range of products such as personal consumption loans, automobile consumption loans, and manufacturing loans, among others.

According to Securities Daily and PBoC, the China Postal Consumer Finance and the Guangzhou branch of the Postal Savings Bank of China jointly issued an online digital yuan personal consumer loan product through the digital yuan wallet, which includes the application, issuance and repayment processes. In terms of enterprise loans,

the Bank of Suzhou offered the first manufacturing loan in digital yuan, two million yuan in unsecured credit, to a local machinery company. In addition, Shanghai launched digital yuan insurance for enterprises. Dalian and Hainan have already seen use cases of the digital yuan in futures delivery, e-commerce settlement, port payment and other scenarios.

The Bank of Communications plans to expand the uses of digital yuan to include government payment, enterprise trade, cross-border payment, among others. JD Group uses digital yuan to pay its suppliers and is exploring its application in corporate payments. The e-commerce centre of China Energy Group's materials subsidiary uses digital yuan to complete B2B online transactions. Meituan announced that it will further expand its carbon neutrality pilot programme with the digital currency, enabling anyone who participates in green and low-carbon consumption on its platform to be rewarded with digital yuan.

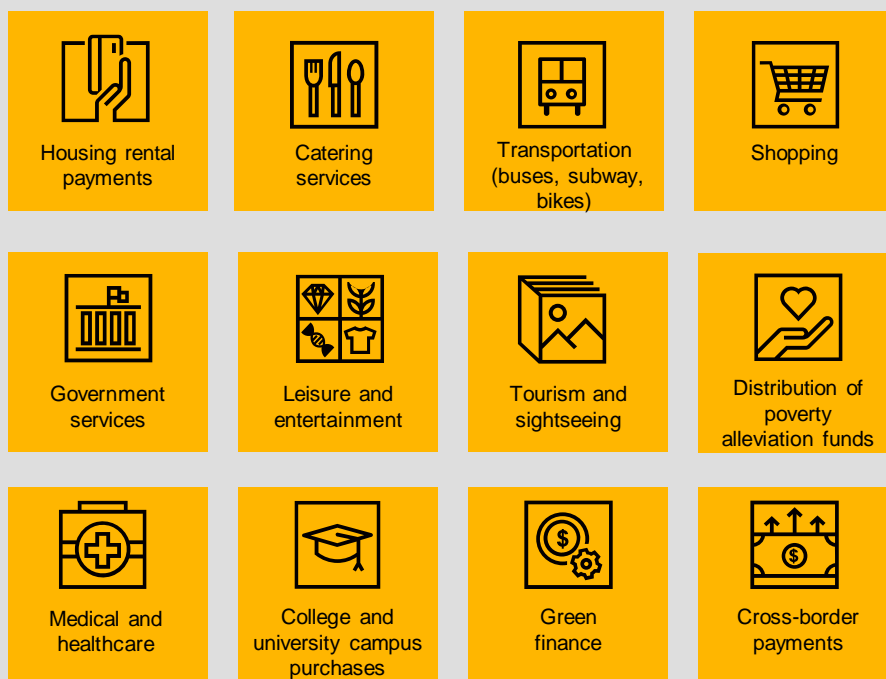
Furthermore, the scope of digital yuan application is continuously developing vertically. Its application expanded from offline to online, extending from the consumer market to the business sector.

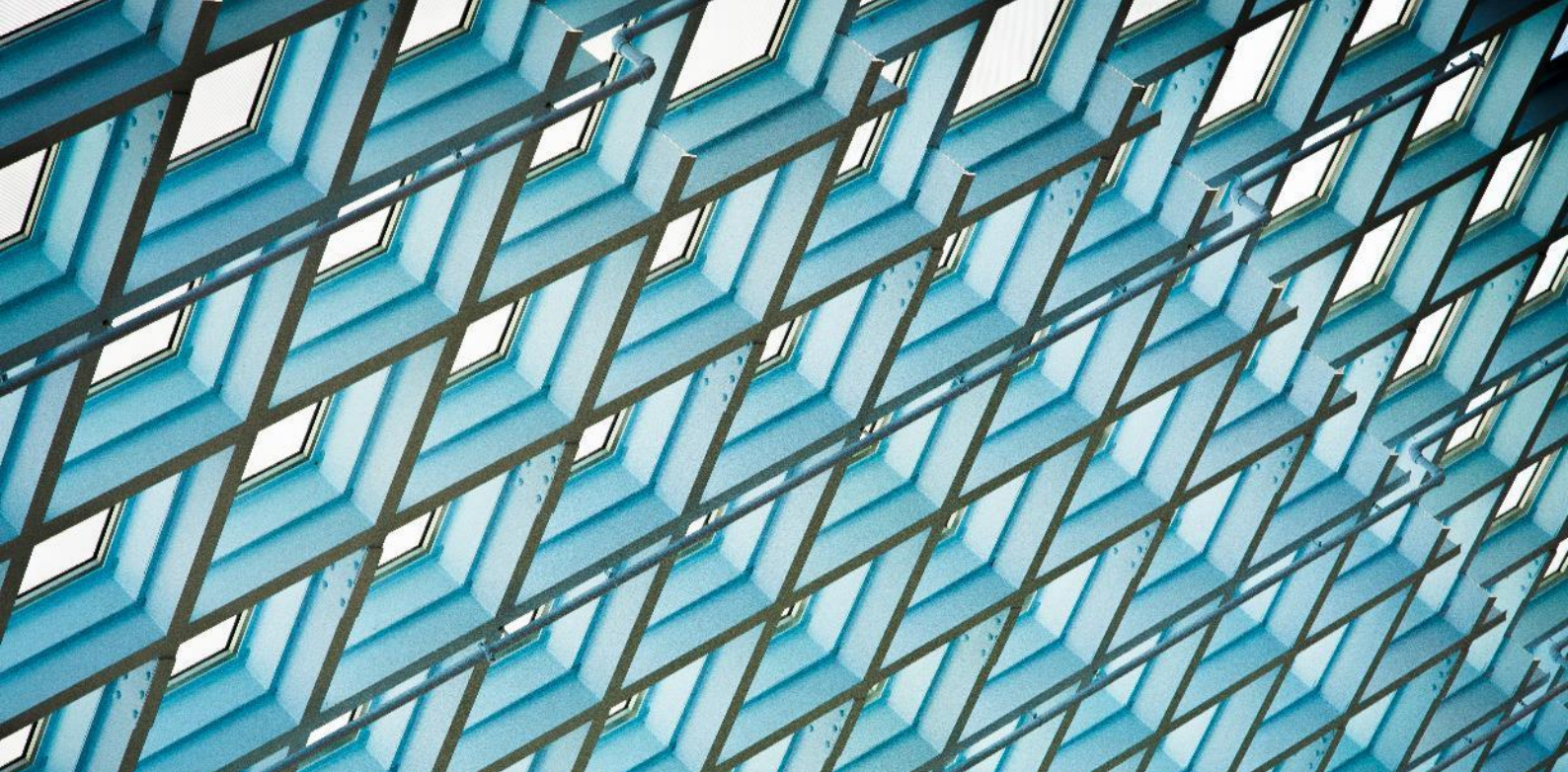
Digital yuan has already been in use in the following scenarios :

In terms of international payments, the digital yuan is likely to extend extensively in the growing 2 trillion yuan cross-border e-commerce market. Shenzhen launched a trial for cross-border digital yuan payments, targeting Hong Kong residents. Digital yuan may play an active role in cross-border financial reform and co-operation between Hong Kong, Macau, and other Greater Bay Area cities.

In February 2021, PBoC, the Bank of International Settlements, the Bank of Thailand, the Central Bank of the United Arab Emirates and the Hong Kong Monetary Authority jointly launched Multilateral Central Bank Digital Currency Bridge (mCBDC Bridge) project to study the role and technical feasibility of utilising a central bank digital currency in cross-border payments. The project later introduced 15 potential application scenarios including international trade settlement, cross-border e-commerce and supply chain finance.

Finally, the business sector should be aware of the potential opportunities and challenges the digital yuan might bring. The digital transformation of currency will certainly improve overall economic efficiency, but accompanying issues such as privacy protection and cybersecurity will become a greater concern. These challenges can add to additional costs for many businesses but they can also create revenue opportunities for others.





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