

lakyara vol.344

Latest digital yuan developments and impact on FinTech sector

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13.Aug.2021



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Executive Summary

Digital yuan trials have been steadily growing in scale and incorporating more use cases while also testing features such as controllable anonymity and dual offline payments. The digital yuan's prospective rollout should reshape both consumer-facing and B2B payment systems, form an integrated public-private payment ecosystem, spur FinTech companies to refocus on their core payment businesses and make the payment market more competitive.

Digital yuan trials continue

Development of the digital yuan (e-CNY), China's central bank digital currency, is accelerating toward mainstream deployment. In late 2019, Shenzhen, Suzhou, Chengdu, the Beijing suburb of Xiong'an and the 2022 Beijing Winter Olympics were selected as e-CNY trial sites. Last October, six more trial sites were added: Shanghai, Changsha, Xi'an, Qingdao, Dalian and Hainan Province.

The first trial involving the public was conducted in Shenzhen, a city in Guangdong Province, during the week of October 12-18, 2020. Subsequent trials have expanded in terms of participants, merchants, use cases and the features tested. The Shenzhen trial tested QR code payments using e-CNY. It involved 3,389 brick-and-mortar merchants and 50,000 local residents to whom a total of e-CNY10 million was distributed. The Suzhou trial, conducted two months later on December 12, was double the scale of the Shenzhen trial, with 100,000 local residents collectively receiving e-CNY20 million spendable at 10,368 merchants. It tested QR code payments at brick-and-mortar merchants as well as both online purchases and dual offline payments¹⁾, the latter of which allow e-CNY to be used like cash when no network is available.

In a second Shenzhen trial conducted on January 7-17, 2021, e-CNY20 million was again distributed to 100,000 local residents. This time, the participating merchants included not only goods retailers but also a wide variety of service providers such as after-school tutoring centers, beauty salons and fitness clubs. The distributed e-CNY was spent in some 140,000 transactions, more than twice as many as in the initial Shenzhen trial.

NOTE

1) Dual offline payment is a feature whereby e-CNY payments can be made in the absence of network connectivity via near-field communication between the payer and payee's smartphones. Like cash, dual offline payments can be used even in environments without electric power or network service, such as in an aircraft cabin or during a power outage.

Each successive trial has involved more participants and use cases. The trials have increased in frequency also. Between mid-May and early June 2021, lotteries distributed e-CNY10 million (181,800 packets) in Suzhou, e-CNY40 million (300,000 packets) in Changsha, e-CNY40 million (200,000 packets) in Beijing and e-CNY19.25 million (350,000 packets) in Shanghai. These four trials had at least 1,030,000 total participants who collectively spent over e-CNY100 million. The testing cadence has accelerated over the trials first seven months, during which eight trials involving a cumulative 1.2 million participants were held.

Multi-tier design aims to balance anonymity with AML

The e-CNY trials are being conducted by the PBoC with the cooperation of designated wallet hosting entities, private companies and the general public. Participants set up their own e-CNY wallets through designated wallet hosts to use the e-CNY distributed by the PBoC. The designated wallet hosts currently include third-party payment services such as Ant Group, JD.com and Tencent in addition to traditional financial institutions.

According to a presentation by Mu Changchun, head of the PBoC's Digital Currency Research Institute, at the 13th Lujiazui Forum 2021 held in June in Shanghai, e-CNY wallets will be available in four levels of anonymity and consist of personal and corporate wallets, hardware and software wallets and parent and sub wallets (see graphic). The higher the level of anonymity, the lower the wallet's maximum payment limit. Conversely, the higher the level of user authentication, the higher the payment limit.

This design aims to make controllable anonymity a key feature of the e-CNY by offering anonymity for small payments while ensuring sufficient oversight to prevent illicit transactions. Specifically, a level-4 wallet, which has the lowest transaction limit, can be set up with just a mobile telephone number. With Chinese telecom carriers legally prohibited from sharing personal information, payments can be made completely anonymously from a level-4 wallet. However, payments from level-4 wallets are capped at CNY2,000 per transaction and CNY5,000 per day. Additionally, level-4 wallets are subject to a maximum balance limit of CNY10,000. They are accordingly intended to be used for small routine payments. Users can upgrade to a wallet with higher payment and balance limits by uploading personal identification and linking the wallet to their bank account.

e-CNY wallet taxonomy

Anonymity	Level	Usage limits	Anonymity Low ↓ High
	Level-1	None	
	Level-2	CNY50,000/transaction Maximum balance: CNY500,000	
	Level-3	CNY5,000/transaction Maximum balance: CNY20,000	
	Level-4	CNY2,000/transaction Maximum balance: CNY10,000	
Ownership	<ul style="list-style-type: none"> ■ Personal —For individuals and sole proprietorships 	<ul style="list-style-type: none"> ■ Corporate —For corporations and unincorporated institutions; customizable 	
Format	<ul style="list-style-type: none"> ■ Hardware wallets —IC card, wearable terminal, IoT device, etc. 	<ul style="list-style-type: none"> ■ Software wallets —App, SDK, etc. 	
Hierarchy	<ul style="list-style-type: none"> ■ Parent wallet —Wallet linked to primary bank account 	<ul style="list-style-type: none"> ■ Sub-wallets —Set up within parent wallet —Two types: personal and corporate 	

Source: NRI, based largely on DCRI Director-General Mu Changchun's 13th Lujiazui Forum 2021 presentation on Digital Transformation of the Economy and Financial Sector

Hardware wallets that do not require a smartphone can make payments through near-field communication (tap to pay). Such wallets come in the form of a card with a mini-display that shows the wallet's balance, payment amount and the number of offline payments remaining until the wallet's limit is reached. They aim to be as convenient as cash. Hardware wallet payments have already been tested, including at Sinopec gas stations in Shenzhen, subway stations in Suzhou and medical clinics in Shanghai.

The PBoC is reportedly working on embedding official digital identification cards in e-CNY hardware wallets. One example is a digital health certificate called a "health code" that attests that an individual has had no known contact with anyone infected with COVID-19. Under China's stringent anti-pandemic measures, persons without a health code are prohibited from entering airports, train stations, shopping malls and other crowded public spaces. If hardware wallets prove to be feasible device for health code verification, they may become public infrastructure that benefit digitally disadvantaged populations like the elderly.

Sub-wallets drive expansion of both B2C and B2B ecosystems

By design, e-CNY wallets can be either a parent wallet or sub-wallet, the latter of which is available in two types: personal and corporate. Personal sub-wallets must be set up with a transaction amount limit and within a parent wallet linked to its owner's account at a designated wallet hosting entity (usually a financial

institution). Sub-wallets conveniently allow their users to make small payments without entering a password. They can be used for services like taxi rides while protecting user's privacy. Because credit cards and QR code payments are directly linked to a bank account in the customer's real name, merchants or payment processors involved in a transaction can access the customer's personal information. Collection and use of users' personal information without consent is a serious issue. In e-CNY transactions, however, the only information exchanged is encrypted numbers. Neither the payment processor nor the merchant can access personal information associated with a transaction without the customer's consent. By thus protecting individuals' privacy and facilitating interoperability with other companies' services, sub-wallets are intended to expedite mass adoption of the e-CNY.

Corporations can likewise set up multiple sub-wallets linked to a parent wallet. They can have a separate sub-wallet to pay each of their suppliers and collect receivables from each of their customers while automating the associated accounting and settlement processes. They can also share data between their sub-wallets and their ERP and/or other IT systems. In sum, sub-wallets, unlike private third-party payment services like Alipay, can facilitate settlement of payments between corporations²⁾.

²⁾ In January 2021, e-commerce giant JD.com paid two of its suppliers with e-CNY through corporate wallets by sending the e-CNY from its wallet at Bank of Communications to the suppliers' wallets at Bank of China.

Expansion of use cases to include G2C payments

In the ongoing e-CNY trials, various e-CNY use cases have been tested in addition to the controllable anonymity discussed above. Such use cases most notably include government-to-citizen (G2C) payments, wage payments from companies to employees and payments by companies to their suppliers. In Shenzhen, the municipal government distributed bonuses in e-CNY to 5,000 medical personnel as an acknowledgement of their dedication in treating COVID-19 patients last year. More recently, Bank of Communications' Hainan Province Branch distributed aid to ethnic minorities in e-CNY.

e-CNY wage payments from companies to employees have also been tested. Bank of Communications' Hainan Branch paid wages and salaries to its employees in e-CNY and is reportedly considering using e-CNY for other forms of compensation, including pension benefits, allowances, travel expenses and bonuses. Chinese e-commerce giant JD.com was the first private company to experiment with paying wages and salaries in e-CNY to some of its employees in

cities where the trials have been conducted.

Making payment market more competitive

In China's Digital Silk Road strategy, data is designated as a key factor of production and linchpin of industrial revolution. China aims to rebuild its consumer-facing and B2B payment systems through the e-CNY's rollout, enabling datafication of various economic activities and laying the groundwork for innovation. Another aim is to promote widespread adoption of the e-CNY among businesses and increase competitiveness by providing a payment system as low-cost public infrastructure.

In May 2021, several private banks, including Ant Group's MYbank, were authorized to host wallets in the e-CNY trials in addition to six state-owned financial institutions, most notably Industrial and Commercial Bank of China. Additionally, private non-financial service companies like JD.com and Meituan are participating in the e-CNY trials as sub-wallet partners. By facilitating a wide variety of businesses' entry to the payment market, the authorities aim to make the market more competitive, upgrade banks and other traditional financial institutions' credit underwriting capabilities, improve KYC/AML efficiency and generate opportunities to create new businesses.

Outlook and impact on FinTech sector

Given e-CNY wallets' role as public infrastructure, they will be integrated into a wide range of private companies' services. The e-CNY is unlikely to supplant incumbent payment services like Alipay, but it will inevitably erode the dominant market position of leading FinTech companies, particularly Ant Group, China's largest consumer financial services provider. Ant Group has grown to its current stature by offering a suite of FinTech services, including micro-lending in partnership with financial institutions. In doing so, it utilizes big-data analytics to evaluate credit information amassed through its payment service. The e-CNY's advent will crimp big-data extraction, a key driver of Ant Group's growth to date.

In addition to the e-CNY curtailing payment services' access to data, Chinese regulatory authorities published a draft seeking public comments on a proposed tightening of regulations on non-bank payment services in January 2021. The proposed regulations would prohibit licensed payment services from providing

financial services beyond the scope of their license, including lending. In response, Ant Group split off its consumer finance business into a newly established subsidiary in June, reportedly to segregate it from the payment service.

While redefining the boundaries between finance and technology, the PBoC is seeking to collaborate more with FinTech companies. In April 2021, the PBoC's Digital Currency Research Institute entered into a strategic alliance agreement with Ant Group. The two parties announced they will jointly promote development of an e-CNY technology platform based on Ant Group's mPaaS mobile R&D platform and OceanBase distributed mega-database.

The roadmap for the e-CNY's full-scale rollout has yet to be disclosed as of the time of this writing (June). Many issues remain to be addressed before the e-CNY goes live, including safeguards against counterfeiting, accommodations for the elderly and other digital have-nots and expedited finalization of requisite operational standards, technical specifications and security standards. Despite such unfinished business, the e-CNY appears on track toward mass adoption sooner than initially anticipated by virtue of efforts to popularize it with the general public through such means as using it to pay wages and to expand its use cases by leveraging mature FinTech companies' already scaled-up technologies and collaborating with popular consumer digital services.

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