

The Impact of the Issuance of e-CNY on the Business Strategy of Commercial Banks

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Abstract: This article comprehensively analyzes the issuance background, main features, technical architecture, and the impact on commercial banking operations and regulatory systems of China's Digital Currency Electronic Payment (DCEP or e-CNY). E-CNY is a legal digital currency that has the essential functions of money and a centralized two-tier operating system, making it compatible and stable with the current financial system. The article first outlines the main characteristics of e-CNY, reviews in detail the research and development process and pilot situations since 2014, and demonstrates its application progress in various scenarios. Furthermore, the article delves into the profound impact of e-CNY on commercial banks' deposits, loans, and international operations, suggesting that e-CNY may reduce the deposit base of commercial banks while providing China's small and medium-sized enterprises (SMEs) with a lower-cost financing channel, thereby promoting the development of the real economy. On the international front, promoting e-CNY is expected to enhance cross-border payments' efficiency and strengthen CNY's international competitiveness. Subsequent analysis of the practice of China Construction Bank (CCB) in the field of e-CNY showcases how commercial banks adapt to the era of digital currency. It also points out the need for further clarification and improvement of the regulatory framework to ensure the sustainable development of e-CNY. Finally, particular attention is given to the regulatory challenges e-CNY poses, especially regarding anonymity management, personal information protection, and delineating regulatory responsibilities.

Keywords: Digital currency electronic payment, Commercial bank business, Regulatory challenges, Financial innovation.

1. Introduction

1.1. The Main Features of e-CNY

After the advent of Bitcoin in 2008, digital currencies became one of the hot topics of the moment. Digital currencies are categorized into decentralized and centralized types, with Bitcoin being a decentralized digital currency and the Central Bank Digital Currency (CBDC) being a centralized digital currency. The Digital Currency Electronic Payment (DCEP or e-CNY), issued by the People's Bank of China (PBC), is a digital form of legal tender featuring the following key characteristics.

The legal tender known as e-CNY has all the essential functions of a currency, including value measurement, exchange ability, and value preservation. It is the same as physical CNY as legal tender. E-CNY enters the financial system as M0 and will coexist with it in the long term. It shares the same status, value characteristics, and legal tender quality as physical CNY. Secondly, e-CNY adopts a dual-tier operational system. The PBC initially exchanges the digital currency with designated operational institutions, such as commercial banks or other financial entities, which distribute it to the public. These operational institutions must deposit 100% reserves with the PBC. Thirdly, loose coupling with bank accounts is supported by e-CNY, which means that opening an e-CNY wallet doesn't necessitate a bank account. Financial services can be obtained through digital wallets for rural residents, mountainous residents, and foreign tourists visiting China who cannot or prefer not to have bank accounts. Fourthly, e-CNY boasts an offline payment function, offering greater convenience and speed than WeChat Pay and Alipay. This feature is crucial in extreme conditions such as natural disasters and network failures. In an era where physical cash is seldom used, the reliance on online payments can be inconvenient without network connectivity. E-CNY's offline payment feature effectively solves this issue. Fifth, e-CNY possesses the characteristic of controllable anonymity. It is anonymous for daily small-scale transactions, while large-value and suspicious transactions are traceable. Unlike popular online payment tools such as WeChat Pay and Alipay, which require linking to bank accounts and providing extensive personal information, often leading to the leakage of such data during transactions, e-CNY functions more like a digital wallet. Opening a digital wallet necessitates a mobile phone number, thus enabling moderate anonymity.

1.2. The Issuance Process of e-CNY

The PBC established a dedicated team as early as 2014 to conduct research on digital currency. By the end of 2017, the PBOC coordinated with multiple commercial banks and related institutions to jointly develop a digital currency electronic payment system, and completed the top-level design, standard setting, functional development, and joint debugging, testing for the Digital Currency Electronic Payment (DCEP).

E-CNY has undergone constant progress since April 2020 through pilot tests conducted in closed environments, including cities like Shenzhen, Suzhou, the Xiong'an New Area, Chengdu, and winter Olympic scenarios in the future. These tests aim to optimize and enhance the payment functions of e-CNY continuously. These tests aim to optimize and enhance the payment functions of e-CNY continuously. In October 2020, Shanghai, Hainan, Changsha, Xi'an, Qingdao, and Dalian were added as pilot cities. In the future, more cities and platforms will participate, among which the online platform scene has added several leading companies such as Meituan and JD.com.

As of October 22, 2021, the number of pilot scenarios for e-CNY has exceeded 3.5 million, with 140 million pilot scenarios having been opened cumulatively. The total transaction amount of e-CNY has approached 62 billion yuan. This has further enhanced e-CNY ecosystem, which covers public utilities, catering services, transportation, retail, securities, and government services. By December 31, 2021, e-CNY's pilot scenarios had grown to 8.0851 million, with 261 million personal wallets opened and a transaction volume exceeding 87.565 billion yuan. The e-CNY (Pilot Version) app was made available in different Android and Apple app stores on January 4, 2022. On January 6, 2022, WeChat began supporting e-CNY. This marks the gradual emergence of e-CNY into the public eye, enhancing its purchasing power and beginning to permeate everyday consumer activities.

2. The Impact of e-CNY on the Business of Commercial Banks

2.1. Impact on Deposit Business

The issuance of e-CNY may lead to a decline in deposits at commercial banks. E-CNY does not constitute deposits at commercial banks; this is a policy set by the PBC, the issuer of e-CNY, and is also stipulated by the forthcoming revised "People's Bank of China Law." There are now two forms of the yuan: digital and non-digital forms. The fundamental difference between the two is that e-CNY is not a deposit of banking institutions but is considered "cash in circulation. Banks, acting as financial intermediaries, are responsible for issuing e-CNY. However, as e-CNY is considered currency in circulation, e-CNY held by customers in banks does not constitute bank deposits. Therefore, banks are not obligated to pay interest on e-CNY.

E-CNY is separate from bank deposits and belongs to different account systems. Specifically, e-CNY does not enter the deposit account system of commercial banks; instead, it is placed in a designated digital currency account. Technologically and accounting-wise, commercial banks cannot commingle e-CNY with bank deposits for disposal. This separation is both a technical setup and an accounting arrangement. For instance, when a depositor transfers part of their bank deposits into an e-CNY account, the funds transform from a non-digital to a digital form. Consequently, the amount no longer constitutes bank deposits, and commercial banks lose the ability to directly or indirectly own this portion of monetary assets or to dispose of them.

The issuance of e-CNY may reduce the operational costs of the entire socio-economic system, enhance capital efficiency, and significantly improve the central bank's ability to control monetary funds. These changes pose substantial challenges to the business structure adjustments of commercial banks and the structural updates of central bank monetary policies.

However, from the overall operational perspective of commercial banks, the issuance of e-CNY may stimulate banks to increase deposit rates or wholesale funding, which could raise loan rates to maintain the net interest margin. Both deposit and loan volumes may experience minor fluctuations with a relatively small impact.

2.2. Impact on Loan Business

The real economy's development can be accelerated by issuing e-CNY, which increases borrowing and lowers financing threshold and costs for small and medium-sized enterprises (SMEs). China's economic development is largely dependent on SMEs, which account for more than half of the nation's tax revenue, over 60% of GDP, and provide a significant number of job opportunities. With the proportion of private enterprises increasing to over 90%, SMEs have made substantial contributions to promoting economic growth, employment stability, international trade, digital transformation, and green development. Due to the underdeveloped nature of direct financing channels, such as China's stock market, SMEs primarily rely on indirect financing from banks and other institutions. However, constrained by information asymmetry and an incomplete social credit system, banks favor providing loans to large or state-owned enterprises. Insufficient funding has dramatically constrained the development of SMEs, which is impeding the growth of the real economy.

The promotion of e-CNY will accumulate a wealth of online transaction data in the personal business sector, allowing banks to rely on this data for credit loan disbursements, partially addressing the issue of information asymmetry. Due to the traceability of e-CNY, banks, and other financial institutions can, upon corporate authorization, swiftly and cost-effectively access enterprises' actual operational status and transaction information. This enables them to assess businesses' credit ratings and repayment capabilities and even monitor real-time changes in enterprise risks. Therefore, its

emergence has made financial institutions more willing to issue loans to SMEs, contributing to the sustained future development of domestic micro and private businesses.

The issuance of e-CNY will also lead to the automation of loan approval and disbursement processes. The online and automated data brought by e-CNY facilitates banks' automation of their loan approval and disbursement procedures, thereby reducing costs.

2.3. Impact on International Business

The issuance of e-CNY presents new opportunities for commercial banks' international operations. As the recognition and usage scope of e-CNY expands in the international market, commercial banks can leverage e-CNY to offer a broader range of cross-border payment, settlement, and financing services to overseas clients, thereby expanding their international business.

The issuance of e-CNY is conducive to enhancing the international competitiveness of the CNY and improving the efficiency of cross-border payments while reducing their costs. Currently, most cross-border transactions still rely on the SWIFT system centered around the US dollar. In 2015, China established its alternative Cross-Border Interbank Payment System (CIPS). CIPS has been moderately successful in processing transactions between China and countries participating in the Belt and Road Initiative since its launch. In 2018, the system processed payment transactions worth 26 trillion yuan (data from the International Monetary Fund in 2021). If CIPS can be successfully adopted as the primary international payment system, it would significantly advance the goal of reducing the intermediary role of the United States in international transactions. China aims to promote the international use of CIPS by advancing the digital yuan (e-CNY), for instance, by assisting other countries in developing CBDCs, providing aid to other nations in e-CNY, and utilizing e-CNY in "Belt and Road" projects [1]. State information supervision uses user payment amounts to coordinate with tax payment platforms during the circulation of e-CNY, which improves tax services and eases people's lives. This initiative breaks the financial monopoly of the West and the dollar, achieving healthy competition in international settlements through traditional settlement systems and e-CNY [2].

Promoting e-CNY towards internationalization of CNY still requires some time. The internationalization of CNY should continue to follow the global market's choice, naturally developing alongside the process of China's financial liberalization. A country's currency's international standing is based on its economic foundation, financial markets' depth, and openness. However, these factors are unrelated to whether China uses e-CNY or traditional paper CNY for cross-border transactions. Therefore, despite e-CNY being technically ready for cross-border payments, its primary design intention is still focused on domestic retail payments. Given this, e-CNY may not significantly impact the internationalization process of the Renminbi or China's progress in financial liberalization reforms, such as the opening of the capital account, interest rate liberalization, or the free float of the exchange rate [3].

3. The Development of e-CNY Business by China Construction Bank

3.1. Preliminary Trial Phase

In August 2020, the China Construction Bank (CCB) APP added two sub-menus, "Digital Wallet Recharge" and "Digital Currency," allowing users in certain regions to directly open a digital wallet by binding their bank cards. According to the "China Construction Bank e-CNY Wallet Personal Customer Service Agreement" (from now on referred to as the "Service Agreement") displayed in the APP, an e-CNY wallet refers to the legal e-CNY carrier with a unique identifiable number that the bank opens for individual customers upon their application. The CCB e-CNY Wallet is divided into APP and Hardware Wallets.

Among them, the "e-CNY App Wallet" refers to the wallet service provided through intelligent applications that support e-CNY wallets. The "Hardware Wallet" refers to a physical medium for storing e-CNY that is opened through counter services or electronic channels, serving as a DCEP carrier with a hardware security unit. The CCB e-CNY Wallet features functions such as payment, receiving, scanning, and transferring funds, with payment options including QR code scanning and NFC payments. The "Service Agreement" indicates that the services provided by e-CNY Wallet include inquiry, payment, withdrawal, deposit, transfer, and credit card repayment services.

Specifically, e-CNY Wallet CCB offers includes four types: Type I, Type II, Type III, and Type IV wallets. Users can only remotely open Type II, Type III, and Type IV wallets through online channels. The balance limit for a Type II wallet is 10,000 yuan, with a single transaction limit of 5,000 yuan; for a Type III wallet, the balance limit is 2,000 yuan, and the single transaction limit is also 2,000 yuan; for a Type IV wallet, the balance limit is 1,000 yuan, and the single transaction limit is 500 yuan.

After a brief launch, CCB took offline its "Digital Currency/Electronic Payment Wallet." Industry consensus suggests that following the pilot phase, DC/EP will face large-scale promotion, necessitating an independent system to support the operation of the entire framework, including applications in payment and transfer scenarios. Digital wallets are one of the crucial systems, with blockchain technology being the key enabler.

3.2. Application of e-CNY after Official Release

In 2021, as one of the first state-owned commercial banks to participate in the trial issuance of e-CNY, China Construction Bank has steadily advanced the research and pilot work of e-CNY under the overall deployment of PBC. The bank iteratively developed e-CNY system and wallet system for the China Construction Bank, including personal wallets, corporate wallets, software wallets, hardware wallets, parent wallets, and sub-wallets, supporting e-CNY exchange and circulation services. Actively participating in e-CNY pilot tests conducted in cities such as Shenzhen, Suzhou, and Xiong'an, the bank has created a wealth of usage scenarios for e-CNY, such as one-click salary issuance, tax payment, medical expense payment, and ticket payment. Simultaneously, collaborated with e-commerce platforms such as JD.com and CCB and investment and wealth management institutions like Tiantian Fund to implement online payment and investment scenarios for e-CNY. The expansion also includes offline scenario applications, enabling transactions between parties in a no-network environment through NFC (Near et al.) on mobile phones or using hardware wallets for e-CNY payments.

As of the end of June 2021, CCB's e-CNY pilot scenarios covered living expenses, food consumption, transportation, shopping, education payments, and government services. The number of personal wallets and public wallets opened has exceeded 7.23 million and 1.19 million, with a combined total of over 28,45 million transactions and a transaction amount of approximately 18.9 billion yuan.

In 2022, CCB focused on promoting the progress of e-CNY in "stimulating consumption." The bank issued 31.98 million red envelopes annually, driving e-CNY consumption by 525 million yuan. Overall, 9.82 million e-CNY wallets were activated through the "CCB Life" platform, and over 70,000 stores were enabled for e-CNY collection. According to the 2022 annual report of CCB, the bank ranked first among its peers in three indicators: monthly active wallets for individuals, monthly active wallets for corporations, and cumulative consumption transactions, and second in cumulative consumption amount [4].

On the Internet of Things (IoT) payment scenarios, China Construction Bank leverages the metallic attributes of e-CNY and the advantages of digital processing and transmission to deduct electricity fees through IoT payments automatically. This innovation breaks the traditional monthly

billing model, enabling real-time metering of user electricity consumption and resolving the difficulty in measuring electricity fees in temporary usage scenarios such as rental apartments and office buildings.

On January 29, 2024, the Shandong Branch of China Construction Bank successfully underwrote a 2.5 billion yuan perpetual corporate bond issued by Shandong High-Speed Group. The bond was settled using e-CNY, marking the first nationwide instance of a science and technology corporate bond achieving fund pooling through e-CNY. The successful completion of this transaction not only leveraged the advantages of digital currency to meet the client's demand for large-scale funds to be credited promptly but also ensured the entire process of fund flow was traceable, better aligning with capital regulatory requirements.

4. Regulatory Issues of e-CNY and Commercial Banks

4.1. Regulatory Challenges of e-CNY

E-CNY must consider multiple regulatory aspects to ensure risk prevention capability in different environments. Among these, the management of anonymity is critical. In the absence of regulatory safeguards and risk control measures, completely anonymous central bank digital currencies are highly susceptible to being used for criminal activities. As central banks and international organizations explore the design of central bank digital currencies, they consider anonymity, an important characteristic, to be a crucial element in maintaining financial security and stability, playing a significant role in risk prevention. Any design that fails to meet anti-money laundering/counter-terrorist financing and anti-tax evasion requirements is unacceptable. The anonymity capabilities of CBDC will be constrained by the risks they may face, rendering fully anonymous CBDC unfeasible.

The regulation of anonymity is crucial for the security of payment systems, helping to prevent fraudulent activities and support an anti-money laundering and counter-terrorism financing efforts. When compared to physical cash, conducting illegal transactions with physical cash is significantly more costly. Logistics is necessary for large cash transactions, but there are risks of damage, loss, and counterfeiting. As the number of physical cash transactions increases, so does the cost, which is rising sharply. In contrast, regardless of the transaction amount, the cost per transaction remains essentially constant for digital transactions. Illegal transactions, including money laundering, could be significantly facilitated by the enhanced portability of CBDC and its similar anonymity of cash. Consequently, CBDC should not be treated like physical cash in terms of anonymity [5].

Real-time monitoring of e-CNY allows the central bank to track the flow of funds and obtain necessary data for the reasons outlined above. The regulatory efficiency of financial markets will be greatly improved by this, and it will play a significant role in combating tax evasion, money laundering, and other criminal activities, as well as in promoting other anti-fraud initiatives. The PBC would have the power to supervise and control financial transactions if E-CNY were granted. In the case where e-CNY replaces cash in the People's Republic of China (PRC), the PBC is capable of monitoring, tracking, blocking, and recovering transactions that were previously unseen. By using this, the regulatory bodies can prevent capital flight and make it easier to identify and combat financial crimes such as corruption, money laundering, terrorist financing, tax evasion, and illegal buying [6].

4.2. Regulatory Issues for Commercial Banks after the Issuance of e-CNY

The issuance of e-CNY has posed specific challenges to the privacy oversight of commercial banks. The regulation of personal privacy in e-CNY is equally crucial. In accordance with the stipulations of the Personal Information Protection Law, the processing of personal identity information requires compliance with a series of requirements, such as adherence to principles of legality, legitimacy, and

necessity. There are discrepancies between the information processing principles and policies implemented during the pilot phase of e-CNY.

To the Postal Savings Bank's current policy on personal information protection for digital currency, when using its e-CNY services, information such as personal mobile device model, operating system, and unique device identifiers has been collected to ensure the regular operation of the business and the security of user accounts. However, the collection criteria for such information have not been disclosed nor demonstrated that such collection can be considered "appropriate operation" or "protection of the account." It's important to consider if the collection process for customer device information, including unique device identifiers, is in accordance with the principle of minimal impact and scope. When customers use e-CNY with M0 attributes for payments, whether commercial banks require an accurate, unique device identifier is a question that needs further consideration by the banks and a convincing explanation provided to the public users [7].

Commercial banks that engage in the daily operations of retail central bank digital currency are still unsure about the specific regulatory authority. Commercial bank activities are currently under the supervision of the China Banking and Insurance Regulatory Commission. In the latest document issued by the PBC, it is stated that the main responsibility of the PBC is to regulate the circulation process of e-CNY, actively explore management measures for e-CNY, and enhance personal information protection. Commercial banks typically possess a vast user base and provide significant financial services, monitoring and protecting customer information for e-CNY, which aligns with the prerequisites outlined in Article 58 of the Personal Information Protection Law. An independent body that primarily consists of external members is required for commercial banks to oversee the protection of user personal information and publish reports on personal information and social responsibility, which are subject to public scrutiny. In theory, it is possible for commercial banks to receive more comprehensive oversight from multiple regulatory bodies. In reality, the presence of multiple layers of regulation seems to increase the likelihood of unclear delineations of responsibilities among regulatory agencies, potentially leading to coordination costs, regulatory gaps, or overlaps [8].

5. Conclusion

E-CNY showcases innovative features such as its legal status, loose coupling with bank accounts, offline payment capabilities, and controlled anonymity, heralding new directions for the financial sector. Since its inception in 2014, e-CNY has transitioned from theoretical research to practical trials, with pilot tests in multiple cities demonstrating its potential across various payment scenarios.

The issuance of e-CNY poses challenges to the deposit business of commercial banks but also presents new opportunities for the loan business, particularly in supporting SMEs. Commercial banks need to adapt to the era of digital currency by adjusting their business structures to address the potential reduction in deposit bases. It also represents a new opportunity for international business, as the promotion of e-CNY offers commercial banks new prospects for international operations, promising to enhance the efficiency of cross-border payments, reduce costs, and strengthen the international competitiveness of the CNY.

The regulatory challenges persist as the adoption of e-CNY grows, with issues such as anonymity management, personal information protection, and delineation of regulatory responsibilities becoming increasingly prominent. The regulatory framework needs further clarification and refinement to ensure the sustainable development of e-CNY.

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