# RESEARCH ON DIGITAL CURRENCY RESHAPING CHINA'S SOCIAL CREDIT SYSTEM

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## ABSTRACT

In the digital economy era, the world is in a wave of digital currency innovation. China's "14th Five-Year" digital economy development plan proposes to explore the establishment of digital renminbi governance rules and promote the use of digital renminbi, which is of great significance to reshape China's social credit system. Based on the theoretical development of digital currency and central bank digital currency at home and abroad, this dissertation refines the core characteristics of fiat digital currency, and puts forward the significant advantages of digital currency in the reconstruction of the modern social credit system, the risks brought by the development of digital currency to the social credit system, and the challenges and opportunities faced by the reform of social credit system. In combination with the exploration and practice of China's digital renminbi and social credit system, this dissertation proposes that the development of China's digital renminbi has become an important element of the reform of social credit system, and the innovation of digital renminbi has accelerated the reconstruction of China's social credit system. In addition, this dissertation suggests that the government should play a leading role in the integration of digital renminbi into the innovation of social credit system, that market players should play a basic role in innovating digital renminbi and improving the social credit system, and that social players should be mobilized to participate in the reconstruction of the social credit system in the digital era.

**Key words:** digital currency; digital renminbi; social credit system; opportunities and challenges; policy recommendations

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The social credit system is an important part of the socialist market economy and social governance system, and is the basis for the modernization of the national governance system and governance capacity. The establishment and improvement of a social credit system is of great significance to forming a good social order, stimulating social vitality, promoting social civilization and progress, and enhancing national soft power and overall competitiveness. China has entered the era of digital economy. The promotion and use of digital renminbi, a fiat currency issued by the People's Bank of China, will not only promote the development of digital economy, but also bring all-round impact on China's production and life style, help reshape China's government credit, commercial credit and social credit systems, effectively control online transaction frauds at the technical level, and reduce transaction costs and risks at the legal level to ensure transaction security. Deeply studying the influence mechanism of digital renminbi on China's modern credit system and advantages of digital renminbi in reconstructing the modern social credit system is of great theoretical and practical significance.

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Wenqing Yan

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## TABLE OF CONTENTS

## LIST OF FIGURES

# CHAPTER 1

# LITERATURE OVERVIEW

As early as in the 1980s, David Chaum (1982) perfected the concept of anonymous payment in the paper Blind Signatures for Untraceable Payments, and proposed to build an anonymous and untraceable electronic currency system, which was the earliest theory of digital currency. In 2008, Satoshi Nakamoto published the Bitcoin white paper Bitcoin: A Peer-to-Peer Electronic Cash System, proposing to build a peer-to-peer and decentralized electronic currency - Bitcoin (BTC), which marked the arrival of digital currency application. Since the birth of BTC in early 2009, the peer-to-peer and decentralized characteristics have spawned a large number of new cryptocurrencies, such as litecoin and dogcoin, and at the same time, derived underlying application development platforms such as Asch and Ethereum and industry applications such as NXT, MaidSafe and Ripple. The impact of digital currency on financial markets and currency systems of countries around the world is expanding. Governments have turned the attitude towards digital currency from negative to positive, and vigorously promoted the research and development of digital currency based on national credit, namely, Central Bank Digital Currency (hereinafter referred to as "CBDC"), also known as fiat digital currency. The People's Bank of China launched digital currency research, and established a digital currency project team in 2014, and began to promote the application for digital currency patents in 2016.

At present, the academic research on digital currency mainly focuses on whether digital currency has currency attributes and its market characteristics. Most scholars believe that digital currency is the ideal currency form, and its recognition depends on the continuous discovery of its intrinsic value (Chowdhury and Mendelson, 2014). Kumhof and Noone (2018) proposed three models of fiat digital currency: financial institution access model, comprehensive access model, and narrow bank access model supported by financial institutions and fiat digital currency. Keister and Sanches (2019) believed that technological progress provides a realistic possibility for the central bank to issue new currencies. CBDC fully combines the characteristics of cash and reserve and can introduce new functions under the development of new technologies. Engert and Fung (2017) concluded that CBDC has the general characteristics that it is the direct liability of the central bank and exists in electronic form, and based on these general characteristics, they believed that CBDC has the function of storing currency value in electronic form and belongs to the direct liability of the central bank. Meaning et al. (2018) gave a more general and normative definition: CBDC is the legal liability of the central bank that exists in electronic form and has the function of payment or value storage.

Different economies may issue fiat digital currencies for different drivers. Frankel (1998) pointed out that coping with the challenges of foreign CBDC, coping with competitive devaluation and coping with Libra challenges are the possible motives for central banks around the world to issue CBDC. According to the report published by the Bank for International Settlements (BIS) in early 2019, improved payment security and payment efficiency are the most important drivers of CBDC issuance in these countries (Barontini and Holden, 2019). Engert and Fung (2017) held that the main motivations for the central bank to issue CBDC include ensuring sufficient money supply, reducing interest rates, supporting unconventional monetary policies, reducing overall risks, increasing payment diversity, and and inhibiting criminal activities. Auer et al. (2020) constructed the CBDC project index and explained the transnational dimension of CBDC research and development from the perspective of economic and institutional drivers under the cross-sectional regression analysis method. Khiaonarong and Humphrey (2019) found through research that emerging economies are more willing to study and issue CBDC than developed economies, and emerging economies pay more attention to the improvement of payment efficiency of CBDC and financial inclusion, while developed economies pay more attention to payment security of CBDC and stability of the financial system. Boar and Wehrli (2021) also found through research that emerging markets and developing economies tend to have the stronger research and development motivation to achieve financial inclusion and payment efficiency goals. Some scholars have also raised concerns about the implementation of digital currency by central banks. For example, Carstens (2021) pointed out that the design of CBDC should not destroy the current two-tier operation system. Auer et al. (2020) pointed out that in the context of the global epidemic, the design of CBDC should meet the non-contact conditions suitable for the entire population. The Distributed Ledger Technology (DLT) has also obvious disadvantages: higher cost of information storage and information synchronization, and unproven security and risks. Carstens (2021) proposed that CBDC might put pressure on banks' profits, and central banks were worried about a "run" on CBDC of banks under high pressure, so some frictional measures should be taken to control the funds flowing into CBDC.

Similar to the debate of international scholars, domestic scholars also have differences in the understanding of digital currency, especially fiat digital currency, and some of them are optimistic about the implementation of digital renminbi. The innovative design of BTC based on the digital wallet, distributed shared ledger and consensus mechanism has enabled digital currency technology to take a new leap forward, triggering large-scale digital currency experiments around the world (Yao Qian, 2018). Liu Kai and Guo Mingxu (2021) believed that compared with existing currency forms, CBDC has obvious advantages in improving payment efficiency and security, promoting financial innovation, and enriching monetary policy toolboxes; therefore, the issuance of CBDC will form a certain alternative relationship with cash and electronic currency. Some scholars also pointed out that the issuance of digital renminbi also faces some risks and challenges. Guan Yiming and Wu Xuchuan (2020) believed that digital currency issued by the central bank with advanced encryption technology and unlimited legal tender is a digital currency with real monetary functions. Feng Yongqi and Liu Ren (2020) considered that due to the existence of the "impossible triangle" among the stable value of digital currency, the credit carrier and the decentralized supply, the supply form of digital currency at national and international levels must be centralized in the future. Digital currency has risks such as technical security risks, credit risks, and legal risks (Zhuang Lei et al., 2019), and at the same time, has problems such as market monopoly, risk regulation, fairness and efficiency, and stability of currency value (Zhuang Lei and Zhao Chengguo, 2017). Digital currency may also involve criminal risks such as money laundering, terrorism, illegal use of computer information networks, and illegal fund-raising (Chen Chunzhu and Li Zhaolin, 2019). Chen Chunzhu and Li Zhaolin (2019), through analysis from the perspective of criminal investigation, held that it is necessary to improve legislation, perfect the regulatory system, enhance the primary responsibility of digital currency trading platforms, refine regulatory measures for digital currency operation, raise the ability of investigation and evidence collection with respect to digital currency-related crimes, and strengthen information sharing and development of regulatory standards in international cooperation. The foundation of digital currency lies in blockchain with such characteristics as distributed ledger, disintermediation trust, symmetric encryption, intelligent contract, time stamp authentication, unalterability and traceability, enabling the social credit system designed based on blockchain technology to effectively overcome the shortcomings of the current credit system and fundamentally solve the phenomenon of fraud and "rent-seeking" in value exchange and transfer, and helping the restoration and reconstruction of social credit ecology (Ban Qing, 2017; Lu Minfeng, 2020).

Scholars at home and abroad focus more on the development of digital currency itself and its impact on economic and social development, and less on the impact of digital currency on the social credit system. From the perspective of currency nature, it is the currency system that has shaped modern market economy and credit civilization. At present, as China's digital currency is in the ascendency, leading the world in some fields, there have been a large number of practices affecting the social credit system, and it is urgent to summarize the law from the theoretical level.

# CHAPTER 2

## IMPACT OF DEVELOPMENT OF DIGITAL CURRENCY ON CHINA'S SOCIAL CREDIT SYSTEM

The social credit system, as an important foundation for the effective operation of the socialist market economy and an important part of the modernization of the national governance system and governance capacity, is of great significance to forming a good social order, stimulating social vitality, promoting social civilization and progress, and enhancing the country's soft power and overall competitiveness.

Today's world is moving towards a digital society, and digital technologies such as cloud computing, big data, Internet of Things, and artificial intelligence will promote all-round economic and social changes. Among them, digital currency will bring all-round and whole-process impact, which will greatly promote the construction of the social credit system, but also constitute a huge shock to the social credit system. The global COVID-19 pandemic has made the development of digital currency even more necessary. Analyzing and tracking the impact of digital currency has become more urgent. Generally speaking, the social credit system mainly includes such links as collection, inquiry, use and repair of credit data, in which the impact of digital currency on the social credit system will also be reflected. This dissertation analyzes the positive and negative impact (Figure 1).

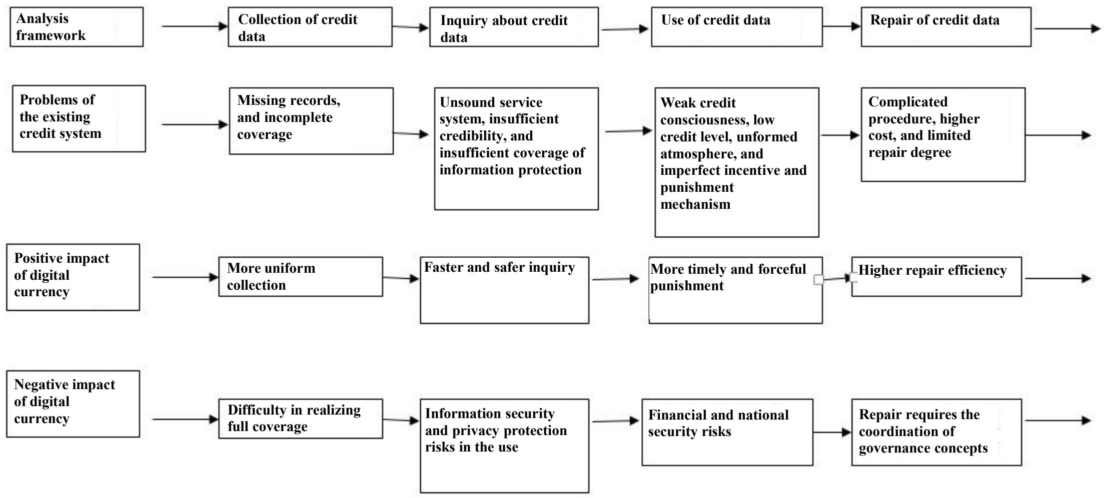


Figure 1. How digital currency affects the construction of social credit system

**Advantages and Important Role of Digital Currency in Reconstructing the Modern Social Credit System**

With the increasingly far-reaching impact of the Internet on people's production and life, economic development and social governance are increasingly driven by data, and mining and utilization of data is becoming more and more important. The core of the entire social credit system is the collection, processing and utilization of credit data. It is expected that digital currency will make the collection of credit data more uniform, inquiry faster and safer, intervention based on credit data more timely and powerful, and repair efficiency of credit data higher.

The collection of credit data is more uniform. At present, China's social credit system has the following main problems in the credit collection link: the credit information system covering the whole society has not yet formed, and credit records of social members are seriously missing. Digital currency will improve this situation by establishing a direct link between the central bank and all digital currency users, and facilitating the establishment of a more uniform credit data system. Traditional currency payment or electronic payment methods involve actual asset transactions, but in the digital currency system, electronic renminbi reflects the payment responsibility of the central bank or the debt of the central bank, and electronic payment is actually the instruction transmission of the payment liability of the central bank, without requiring direct asset transactions between financial institutions. [1]This makes digital currency electronic payment (DCEP) become the backup system for all electronic payments, through which the central bank can master all payment records and obtain all credit data based on payment information, so that the credit data scattered in financial institutions can be gathered to the central bank, the integration of credit data, especially financial credit data, realized, and the coverage of the social credit system expanded greatly.[2]

More broadly, because money guides and determines behaviors of all economic entities, currency plays a central role in the construction of the social credit system. [3]On this basis, digital currency may contribute to the reconstruction of the international trust system. For example, at present, more than 60% of global reserves and 90% of foreign exchange transactions are carried out in USD. The international credit of the United States largely comes from the world financial system based on USD. Once a digital currency becomes the main medium of global financial activities, it will greatly enhance a country's international trust.

The inquiry about credit data is faster and safer. Due to the undeveloped credit service market, immature service system and non-standard service behaviors, the credibility of service institutions in China's existing social credit system is generally insufficient, and the protection mechanism of data privacy and other rights and interests of credit information subjects needs to be strengthened. Encryption

[1] Yao Qian. Understanding Central Bank Digital Currency: A Systematic Framework. Science China: Information Sciences, 2017(11).

[2] Yaja J.Fanusie. “China’ s Pursuit for Leadership in Digital Currency”, Jan 29 2019.

[33] Michael B.Greenwald. “What Happens to the Dollar If the Chinese Digital Yuan Goes Global?”, Apr 13 2021.

technology is a key element of fiat digital currency to achieve technical security and trust. The combination of China's digital currency and blockchain containing encryption technology helps to improve this situation, making the storage and inquiry of credit data based on digital currency more secure and reliable.[4]

China's digital currency is advanced in tandem with blockchain technology. China is one of the first countries to study CBDC. The digital currency research group set up by the central bank in 2014 is the world's first official institution engaged in the research and development of fiat digital currency. In 2017, upon approval of the State Council, the People's Bank of China organized the relevant institutions to jointly carry out the research and development of the digital renminbi system (DC/EP). In 2020, the Ministry of Commerce issued the Circular of the Ministry of Commerce on Issuing the Overall Plan for Comprehensively Deepening the Pilot Innovation and Development of Trade in Services, specifying that the pilot program of digital renminbi will be carried out in the Beijing-Tianjin-Hebei region, the Yangtze River Delta, the Guangdong-Hong Kong-Macao Greater Bay Area and the eligible pilot areas in central and west China, and the pilot will be comprehensively deepened in 28 regions, including Beijing. China has synchronously promoted the development of blockchain network. In 2019, the blockchain-based service network (BSN) jointly designed and built by six institutions, including the State Information Center and China UnionPay, was officially released after the closed beta. In the same year, the Blockchain-based Service Network Development Association held the first partner conference, and approved such measures as the unified operation and maintenance mechanism, key system and one-stop regulation, greatly reducing the development,

[4]Yao Qian. Understanding Central Bank Digital Currency: A Systematic Framework. Science China: Information Sciences, 2017(11).

deployment, operation and maintenance, interconnection and regulation costs of blockchain applications. In 2020, BSN was officially put into commercial operation.

The traditional Internet operates based on linear transmission of data from one point to another, while blockchain technology enables broadcast transmission of data, and distributed storage of information relying on multiple nodes simultaneously, and allows for consensus formation based on data encryption and verification. The distributed storage and broadcast transmission of data make the inquiry process of credit data more simplified, and data inquiry faster and more efficient, while the application of encryption and verification technologies can make credit data more authentic, secure and reliable.

Punishment, incentive and other interventions based on credit data will be more timely and powerful. China's existing social credit system has a major problem that the awareness of social integrity and credit level are low, and the social atmosphere of performing commitments and being honest and trustworthy has not yet formed. As a result, major and serious work safety accidents, and food and drug safety incidents occur from time to time; commercial fraud, production and sale of counterfeit products, tax evasion and fraud, fraudulent application and claim, and academic misconduct continue despite repeated prohibition; the integrity of government affairs and judicial credibility are still far from the expectations of the people. More importantly, the mechanism of giving incentives to acts in good faith and punishments to acts in bad faith is still very imperfect, and incentives and punishments are often limited to a certain field and a certain region, so that the cost of breaking faith is low and the incentive for keeping faith is insufficient.

The development of digital technology may make the relevant punishments based on credit data more timely and powerful, thus improving the use efficiency of the social credit system. For example, in 2020, H&M announced that it would no longer use cotton from Xinjiang; as an intervention, the relevant mapping apps in China removed H&M's location from the user interface, playing a good punishment effect. For another example, due to the suspected violation of the Cybersecurity Law of the People's Republic of China, 25 apps of Didi were pulled off shelves by competent authorities, forming a regulatory deterrent based on digital technology. There is no doubt that with the faster and more powerful intervention and sanction tools given by digital technology, the central bank can easily impose sanctions by banning DCEP funding to certain merchants, which will help to promote compliance with credit commitments and social norms.

As the use of currency for transactions and payments becomes a necessary medium for behaviors of all natural and legal persons, punishments based on credit data will have higher deterrence. For example, the government can set the authority of digital currency and take necessary restrictions and sanctions on transactions of the subjects breaking faith, so that credit is directly linked to the convenience of social interaction of actors. Based on this, other public departments or institutions will conduct better regulation and law enforcement based on authorized credit data, and more timely and powerful control over work safety, food and drug safety, commercial fraud, production and sale of counterfeit goods, tax evasion, fraudulent application and claim, and academic misconduct, so as to greatly improve social credit compliance of the whole society.

The efficiency of credit data repair can be higher. Because digital currency is highly dependent on technology, the efficiency advantages of technology governance will also be more fully reflected in the social credit system shaped by digital currency. Under the traditional social credit system, credit repair mainly completed based on administrative approval and manual operation is limited actually due to cumbersome procedures and higher labor and time costs. The collection of massive electronic payment data makes personal credit data larger in quantity, more concentrated, and more standardized, makes it possible to conduct technology-assisted and artificial intelligence operations based on certain social standards, and makes it easier to achieve credit repair technically, thus providing technical support for the construction of an inclusive social credit system.

**Risks and Challenges Brought by Digital Currency to the Social Credit System**

Any new technology has both advantages and disadvantages, and so does the impact of digital currency on the social credit system. While digital currency promotes the construction of the social credit system, it also brings challenges in the blind area of population coverage, information and privacy protection risks, financial stability and national security risks, and synchronous update of governance concepts and systems.

The collection of credit data is still difficult to reach some marginalized people. There are still 1.7 billion unbanked people in the world. 20% of adults in China are still unbanked, compared with 8.6% in Europe and 5.4% in the United States. These unbanked people are mainly rural and elderly. Digital currency has higher technology and equipment requirements than bank accounts, showing a huge "digital divide". A large number of rural, elderly, low-income population may not be able to or do not know, or are not skilled in the use of digital currency, and excluded by digital currency, making them further marginalized in the economic and social status. At the same time, the credit data of this group of people may still not be collected in a timely and comprehensive manner, thus limiting the integrity of social credit data and use scenarios of credit data to a certain extent.

In the era of digital currency, credit data still has information and privacy protection risks. In the traditional social credit system, banks and other third-party payment institutions hold the payment information of institutions and individuals, but cannot hold all the payment information of the country or even a larger scope, which means that personal payment information is divided into different institutions, and the privacy of institutions and individuals is at risk of limited disclosure. However, in the social credit system shaped by digital currency, the central bank can theoretically obtain all the payment information and identity of payers, which makes the payment information and privacy of institutions and individuals more fully mastered, but the concentration of information management authority also poses risks to information security itself, making it possible for some governments or persons to monitor users and restrict the freedom to act in violation of laws or regulations or without engagement. Once such privacy is leaked or stolen, it will cause enormous damage to institutions and individuals.

There are financial stability and national security risks in the use of digital currency and credit data. On the one hand, the use of digital currency is conducive to the technical protection of credit information security, but it has inherent financial risks and even national security risks. First of all, cryptocurrencies represented by BTC themselves have limitations such as lack of value support, sharp price fluctuations, and main use for speculation, threatening financial security and social stability. 5Secondly, given that the current global financial system is based on USD, if the pattern of digital currency remains the same in the future, the transaction data involving foreign exchange will likely be integrated into the credit data system of other countries, making the credit information of Chinese institutions and individuals

[5] Digital Currency Research and Development Working Group of People's Bank of China. White Paper on the Research and Development Progress of China's Digital Renminbi, July 2021, p. 3.

more grasped by other countries, the strategic role of credit information greatly enhanced, and credit information become an instrument of financial sanctions and other economic interventions against China, thus threatening China's financial stability and national security.

The repair of credit data may require more supporting update of modern governance concepts and systems. Although digital currency does not involve the direct transfer of assets in the transaction process, the anonymity of data is reduced in the process of transformation from paper currency to digital currency, and digital currency entering in and exiting from digital wallets will inevitably leave a digital traces. This could make the repair of credit data fundamentally impossible, or at least more dependent on technology, and puts forward higher requirements for the inclusiveness of the social credit system itself. The social credit system in the era of digital currency relies on technology, but needs more guidance of modern governance concepts. It is necessary for the relevant stakeholders to reach consensus, negotiate about plans and form norms based on the concepts of co-construction, co-governance and sharing, and provide different types of credit repair plans based on the nature and occurrence time of different types of behaviors, so as to give play to the role of credit data in guiding and regulating behaviors.

# CHAPTER 3

# LOCAL PRACTICE OF RECONSTRUCTION OF CHINA'S SOCIAL CREDIT SYSTEM BASED ON DIGITAL CURRENCY

Digital currency is the embodiment of the development of global digital economy in the financial field in recent years. Digital renminbi is the manifestation of digital, virtual and electronic fiat currency in China. China's digital currency innovation has developed rapidly, and gradually integrated with the reconstruction of social credit, which has greatly changed the people's way of production and life, and also brought revolutionary impact to China's social credit system. 6Based on 17 "double demonstration" cities in China, this dissertation summarizes the characteristics of local construction of the social credit system, analyzes the impact of digital renminbi on the reconstruction of the social credit system, and puts forward countermeasures and suggestions.7

## The Development of Digital Renminbi has Become an Important Element of the Reform of the Social Credit System

Issued by the People's Bank of China, digital renminbi is a fiat currency endorsed by national credit and based on the broad account system, and supports the loose coupling function of bank accounts. At present, the People's Bank of China has basically completed the top-level design, standard formulation, function research and development, and joint debugging and commissioning of digital renminbi, and is carrying out the pilot program across the country. The promotion of digital renminbi

[6] Social credit system can be divided into narrow sense and broad sense. This dissertation uses broad sense, covering such aspects as government integrity, business integrity, social integrity and judicial integrity.

[7] These cities are both pilot cities under the digital renminbi program and demonstration cities in the construction of the social credit system, including Beijing, Tianjin, Shanghai, Chongqing, Dalian, Xiamen, Qingdao, Shenzhen, Nanjing, Hangzhou, Hefei, Jinan, Wuhan, Guangzhou, Chengdu, Suzhou, and Weihai.

has become a highlight of the construction of the social credit system around the country, with the following experience gained:

1. Realize organic nesting of digital currency and social credit system through policy guarantee and planning guidance

China's digital currency innovation is leading in the world. In the development, firstly, China will face a series of institutional, management and technical risks, and especially, pay attention to policy guarantee and planning guidance. In the construction of the social credit system, some provinces and cities have explored the inclusion of digital currency in the legislation and planning of the credit system. For example, in the process of building the digital economy innovation and development pilot zone, Shenzhen has successively issued policies such as the Administrative Measures of Shenzhen City for Public Credit Information, the Data Regulations of Shenzhen Special Economic Zone and the Social Credit Regulations of Shenzhen Special Economic Zone to support the research on digital currency and innovative application such as mobile payment in Shenzhen. Shanghai Municipality has issued the Three-year Action Plan for Deepening the Construction of the Social Credit System (2021-2023), which proposes to give full play to the advantages of Shanghai such as rich credit industry foundation, data resources and application scenarios, promote the research and development and application of credit digital technology in the forefront of the country, accelerate the reform of the digital credit system, and comprehensively optimize the digital support system for public credit platforms. The Hangzhou Municipal People's Government has issued the Implementation Opinions on Further Accelerating the Construction of a Social Credit System, proposing to include the behaviors of platform enterprises and operators in platforms such as damage to the rights and interests of consumers, production and sale of counterfeit goods, infringement of intellectual property rights, and engagement in unfair competition into the scope of credit regulation, impose the corresponding credit-related punishments against serious violations, and promote the official development of wage payment through digital renminbi online and offline to effectively solve the problem of cross-bank and multi-party wage payment.

2. Focus on the development of multi-type application scenarios and expand the coverage of digital renminbi through activation data

The innovation of digital renminbi lies in the application. The efficiency and security of use of digital currency is improved by adapting to different payment and settlement scenarios. Data flow is an important support to expand the coverage of digital currency. Activating and accelerating the interconnection of financial data can fundamentally achieve the replacement of the traditional financial mode. Shenzhen supports the inquiry about own credit reports through the channels of "one network and three terminals" (szcredit.org.cn, iShenzhen app, WeChat, and Alipay) and offline windows, reflecting the two advantages of high payment efficiency and no transaction cost. Suzhou has completed the upgrading of digital renminbi collection equipment and developed designated online e-commerce within the urban area, with the participation of nearly 10,000 merchants, covering shopping malls and supermarkets, daily retail, catering consumption, life services and other fields, effectively solving the problem of "double spending" (repeated consumption) that may be faced in the transaction process. Beijing has granted the first "Beijing Fiat Digital Currency Pilot Zone" plaque to Shunyi District, promoting digital currency in Shunyi, the capital's first gate, and accelerated the launch of testing on digital renminbi application scenarios in bookstores, coffee shops and other places. Beijing has also set up the "Digital Currency Research Center" to fully serve the development of digital economy in the Beijing-Tianjin-Hebei region. Xiongan New Area's "blockchain fund payment platform" pays salaries to builders of the spring afforestation project in the form of "digital renminbi", marking the smooth implementation of China's first "blockchain + digital renminbi" application scenario.

3. Achieve compatibility and sharing of financial and credit platforms with "digital economy + credit"

Digital renminbi has both financial functions and public attributes. While deepening the sharing and opening of credit data resources, local governments continue to accelerate the development of public credit data to financial sub-platforms, and achieve platform compatibility and sharing, effectively improving the credit regulation capability. Shanghai has strengthened the opening of public credit data, established a list of data opening, conducted graded and classified management of public credit data, clarified the types and conditions of data opening, and promoted the excavation of maximum value of credit data. Hangzhou has established "red and black lists" system for credit information, created a "credit card" for Hangzhou citizens, and achieved full coverage of credit records of permanent residents in Hangzhou. Suzhou has built "digital economy + credit", strengthened the application of the credit system in the development of digital economy, and established and improved the professional credit files of digital economy practitioners; established and improved the credit regulation system for Internet platforms, and established a graded and classified credit regulation system for platform subjects such as sharing economy and Internet celebrity economy. Weihai has highlighted the application of credit and joint rewards and punishments, actively explored and formed the "123+5" credit Weihai construction mode, and promoted the construction of a credit demonstration city with positive results. Chengdu has implemented the "credit +

commercial block" mode, and by combining public credit information with market credit information, formed a two-dimensional code reflecting the credit status of merchants that enables consumers to grasp the star rating of merchants by scanning, realizing the transformation from internal supervision of the industry to supervision and management of market customers.

**Digital Renminbi Innovation Accelerates the Reconstruction of China's Social Credit System**

Credit is the essential attribute of currency. From the development history of human currency, the form of currency continues to evolve with the progress of technology, including physical objects, metal coins, paper money, and digital currency, which is a new form of currency in the digital era. In China, the emergence of digital renminbi has brought revolutionary impact to the social credit system.

1. The features of digital renminbi, such as convenience, security and compliance, create conditions for the reconstruction of the credit system

Digital renminbi is characterize by convenience, security, universality, economy and legitimacy. With the evolution of technologies such as mobile Internet, trusted and controllable cloud computing, secure storage on terminals, and blockchain, great changes have taken place in the payment method of Chinese residents: cash and credit cards have been gradually replaced by electronic payment, which has become a new form of daily transaction settlement for the masses of people. Digital currency has improved the convenience of transactions and reduced transaction costs. In terms of security, by using a variety of protection technologies, digital renminbi achieves non-repeatable spending, no illegal copying and counterfeiting, tamper-resistant transactions and anti-repudiation, and a multi-level security protection system is formed to ensure the security and controllable risks of digital renminbi in the full life cycle. In terms of compliance, digital renminbi is subject to the existing international standards for anti-money laundering and anti-terrorist financing and domestic legal requirements: for example, digital renminbi can be widely used to prevent telecom fraud, online gambling, money laundering, tax evasion and other illegal and criminal acts, to ensure that the relevant transactions comply with the existing legal framework and regulatory requirements. Unlike cryptocurrencies such as BTC, digital renminbi overcomes limitations such as lack of value support, sharp price fluctuations, low transaction efficiency, and huge energy consumption, and can play the function of fiat currency.

2. Digital renminbi can effectively control online transaction frauds at the technical level

The technical base of digital currency is derived from blockchain technology. The modification of ledger records in the blockchain must be witnessed by the whole network, which can eliminate the possibility of private tampering to the greatest extent. Each ledger records all transaction information since its birth, and transaction records are permanently stored and cannot be destroyed, which can achieve absolute trust in transactions. Digital renminbi is also highly traceable. Under the condition that the relevant legal documents are issued in strict accordance with procedures, data verification and cross comparison of transactions can be carried out, which can effectively combat fraud, money laundering, tax evasion and other illegal and criminal acts. The use of digital renminbi can put defaults such as concealment of property under timely tracking and supervision, and currency flows such as cash under better monitoring, eliminate restrictions on the flow of large funds, generally improve capital efficiency, and curb defaults. At the same time, regulation departments can track any transaction by use of big data, such as granting subsidies to remote areas to achieve precision and avoid misappropriation. Digital renminbi integrates currency credit with natural person credit, and fundamentally improves China's social credit system.

3. At the legal level, digital renminbi helps to reduce transaction credit costs and risks and ensure transaction security

The legal attribute of digital renminbi determines its legitimacy, providing a legal basis for financial security regulation. Different from the central server accounting method for traditional currencies, national control over the issuance right of digital renminbi is essentially national credit guarantee for currency, enhancing the legal effect of digital renminbi. In the world, there are many kinds of digital currencies. Compared with some "private currencies", digital renminbi has a legal status in China, and has significant advantages in solving the problem of "consideration payment" in the performance of agreements. The development of digital renminbi will help reduce the high cost of issuance and circulation of traditional paper currencies, eliminate the risk that paper currencies can be easily forged anonymously, and used for illegal activities such as money laundering or terrorist financing, and enhance the convenience and transparency of economic transactions. In the process of implementing the monetary policy, the State can realize the precise placement, real-time transmission, forward guidance and counter-cyclical regulation of currency, and solve the liquidity trap dilemma that the modern monetary policy cannot achieve "negative interest rate".

4. The development of China's social credit system needs new vitality injected by digital renminbi

With the rapid development of information technology in today's world, new economic forms such as platform economy, sharing economy and digital economy have brought the unprecedented impact on the social credit system, and also produced a series of new credit risks. Faced with new challenges such as digital technology, business mode and social changes, China's social credit system itself needs to accelerate its reconstruction and constantly absorb new financial modes. The development of digital renminbi is an important part of social credit informatization. Digital renminbi promotes the comprehensive reform of government credit, commercial credit and social credit from all links such as credit generation, credit fulfillment and credit regulation. Taking credit data opening as an example, in order to improve the public information and credit data system, the State needs to standardize the procedures for obtaining and using public information and credit data in the form of laws. Among them, digital renminbi will accelerate the digitization of credit and promote the improvement of the opening of the credit system. The emergence of digital renminbi will promote the shift of China's currency system from national credit to "national credit + technical credit", and change the operation logic of China's social credit system.

# CHAPTER 4

## EXPLORATION OF REFORM OF CHINA'S GOVERNMENT CREDIT SYSTEM RESHAPED BY DIGITAL CURRENCY

The government credit system, such as fiscal revenue and expenditure, and government investment and financing, is an important part of the social credit system and a regulating valve for the healthy development of national economy. Currency is not only the value carrier of the dual circulation of national economy, but also the value medium of the operation of the government credit system. Nowadays, the development of digital technology and digital economy has accelerated the transformation of currency form to fiat digital currency. Although the evolution of currency form cannot change the nature of the operation of the government credit system, it can change the way of the operation of the government credit system. Therefore, fiat digital currency will inevitably have a huge impact on the reform of the government credit system, and objectively require the reconstruction of the government credit system to match the issuance and circulation system and mechanism of fiat digital currency. We propose: to build a government digital credit operation system in combination with the operation mechanism of fiat digital currency; to innovatively develop government digital credit products and build a green government credit system in combination with the advantages in the use of fiat digital currency; to actively explore digital payment systems and regulatory systems for digital tax, digital non-tax income and financial expenditure in combination with the circulation conditions of fiat digital currency; to strengthen the construction of the legal system for digital government credit in combination with the characteristics of fiat digital currency.

**Definition of Connotation of the Government Credit System**

The credit behavior with the contract as the carrier, information as the foundation, trust as the cornerstone, and loan and repayment on schedule as the core content is not only an important mechanism for resource allocation, but also a basic system for the operation of modern market economy. The construction of a perfect social credit system is an important sign that China's socialist market economy is maturing. The government credit system is not only an important part of the social credit system, but also leads and dominates the construction and development of the social credit system. The so-called government credit system, in a narrow sense, is a general term for lending activities, lending relations and their management mechanisms formed with the government (including the central government and local government) as creditors or debtors, including the credit investigation, credit collection, credit recording, credit rating, credit guarantee, credit information disclosure, credit risk management, credit insurance, punishment for breaking faith, credit repair and other activities carried out by governments at all levels as credit recipients in financial investment and financing activities and their institutional norms. In the broad sense, the government credit system refers to the fulfillment of honesty and trust commitments by the government in performing all government functions and serving the people, covering tax credit, claim and debt credit, and government credit, to avoid excessive tax collection, default on arrears to market players, government debt default, policy instability and incoherence, and other government dishonesty. Obviously, no matter in the narrow sense or in the broad sense, the government credit system is by no means inseparable from currency circulation in most aspects. After replacing physical objects as a medium of exchange, currency has become the most important carrier for the operation of the government credit system.

**Challenges and Opportunities for the Future Reform of the Government Credit System**

1. Challenges for the future reform of the government credit system

Firstly, challenges brought by the issuance and circulation of fiat digital currency. In the era of digital economy, it has become a trend that digital currency replaces physical cash currency. Central banks in the world's major countries have developed and piloted fiat digital currency. It can be predicted that in the near future, fiat digital currency will replace cash currency, and become an important part of the social money supply system together with digital deposit currency. Once fiat digital currency is widely issued and circulated, it will inevitably bring direct replacement of the currency medium of the future government credit system, and thus bring changes in the management and operation mode, which requires the relevant departments to take the initiative to meet challenges and plan reforms.

Secondly, huge challenges brought by the impact of COVID-19 and its continued global spread. The COVID-19 breaking out since 2020 is still raging around the world. The epidemic has not only brought great uncertainties for China's consolidation of the anti-epidemic achievements and maintenance of the sustained and healthy development of national economy, but also brought great challenges for the reform of the government credit system in the future, because the impact of the epidemic has caused great damage to the operation of national economy and tax revenue, aggravated the fiscal deficit and the expansion of government credit demand, and affected the future reform process of the government credit system.

Thirdly, great challenges brought by ensuring the stability of the domestic supply chain, value chain and industry chain. In today's world, the intensifying competition between China and the United States led by U.S. hegemony has severely impacted the stability of the domestic industry chain, supply chain and value chain. To this end, China proposes to build the new dual-circulation development paradigm which takes the domestic market as the mainstay and lets the domestic and international markets reinforce each other, improve economic resilience, ensure economic security, and achieve scientific and technological self-reliance. This requires huge financial expenditure and tax reduction support, stability of the domestic industry chain, supply chain and value chain, accelerated "digital intelligence" of the government credit system and improvement of the allocation efficiency of government credit resources, thus increasing the pressure on the reform of the government credit system.

2. Opportunities for the future reform of the government credit system

The overall goal of China's government credit system reform is to build a government credit system compatible with the future economic form, technical form and currency form, and promote the sustainable capacity expansion and efficiency improvement and controllable risks of government credit. In general, the future reform of the government credit system faces three opportunities:

Firstly, opportunities from the development of digital economy and the empowerment of digital technology. On the one hand, the rapid development of digital economy, known as the fourth industrial revolution, has become a new engine to promote the high-quality development of China's economy today. The high-quality development of China's economy will inevitably expand the tax base and tax source, reduce the pressure on government borrowing, and provide an effective financial basis for the reform and development of the government credit system in the future. On the other hand, the rapid development of digital technologies that digital economy relies on, such as big data, blockchain, artificial intelligence, cloud computing, Internet, and

5G, provides rare technical support for enabling the reform of the government credit system and promoting the digital and intelligent development of the government credit system.

Secondly, opportunities from implementation of green development positioning with the "carbon dioxide peaking and carbon neutrality" goal. Practicing the goal of "carbon dioxide peaking and carbon neutrality" and achieving harmonious coexistence between man and nature are the important goals of China's future economic development, and point out the direction for the reform and development of the government credit system. The future government credit system should not only serve the goal of green development, but also practice the concept of green development itself, enable the issuance of green government bonds through digital technology and digital currency, and build a green government credit system. Therefore, green development is both an opportunity and a challenge for the reform of the future government credit system.

Thirdly, opportunities from economic strength and enhancement of the international status of renminbi. After more than 40 years of hard work, with GDP increase from RMB 364.5 billion in 1978 to over RMB 114 trillion in 2021, China has become the world's second largest economy, largest industrial country, largest trader in goods and country with the most foreign exchange reserves, and significantly enhanced its international economic strength. Meanwhile, the global status of renminbi has steadily improved, rising to the fourth place in international payments in December 2021. The rise of economy and renminbi in the global status will broaden the operation space of China's government credit system, and then enable China to fight for more credit resources from the global market.

3. It is of great significance for fiat digital currency to reshape China's government credit system

Fiat digital currency not only puts forward new demands for the reshaping of China's government credit system, but also has great significance for improving the operation efficiency of China's government credit system.

Firstly, the use of fiat digital currency featuring real-time information transmission and real-time online payment of funds helps to improve the payment and settlement effectiveness and efficiency of the government credit system, reduce the cost of payment and settlement, and shorten the settlement time for financial revenues and expenditures. Secondly, based on the circulation network system for fiat digital currency, and relying on the traceability and imtamability of fiat digital currency accounts, tax evasion can be effectively regulated and prevented to ensure that tax revenue is paid in full and timely into the treasury; at the same time, the operating movement of government claims and debts and the credit status of market players involved can be effectively tracked and supervised. Thirdly, relying on fiat digital currency accounts and the circulation system, digital government bonds are issued to market players as an open market operation tool of the central bank, which can realize the effective connection and close cooperation between the central bank's monetary policy and the government's financial policy under the digital currency system, and improve the effect of the coordinated implementation of the financial policy and the monetary policy. Fourthly, relying on the fiat digital currency media and circulation system, it helps the government to innovate and issue convenient and cheap digital credit products, such as digital national debts, and digital municipal bonds, reduce the cost of government debt, improve the efficiency of government investment and financing, and improve the timeliness of government debt repayment.

**Main Problems in the Construction of China's Government Credit System and Reasons Therefor**

For a long time, China's government credit system has played a demonstrating and benchmarking role in the construction of the social credit system; in the process of performing government functions and serving the people, the government's integrity and credibility have been gradually enhanced, and the relationship between the market and the government has gradually been straightened out; government credit has become the cornerstone of "credit China" and the most reliable form of credit for the public. However, there are still major problems as follows:

1. Among government debts, local government debts are not transparent and have high risks

From the reform of the tax distribution system in 1994 to the promulgation of the new Budget Law in 2014, the mismatch between the Financial power and the administrative power of central and local governments, and the huge expenditure (including project supporting) liability of the local government led to local finance being unable to make ends meet. Under the situation that the borrowing power was concentrated in the central government, by the end of 2016, the national government debt balance reached RMB 27.33 trillion, including the debts of more than RMB 15 trillion accumulated by the local government from the financial system through the establishment of financing platform companies in disguise, and the central government's debt balance of RMB 12 trillion. Although most local debts were replaced by bonds later, the repayment period was delayed, together with the implicit guarantee of the government, arrears with enterprises and other implicit debts (between RMB 21 trillion and RMB 30.5 trillion as estimated by CCXI), forming a huge debt risk. After the issuance of the new Budget Law in 2014, the borrowing function of financing platforms was stripped away; local governments could issue bonds for financing, with the authority executed by provincial governments; governments at city and county levels still lacked the independent borrowing power; and government debt revenue did not match the demand for bond issuance. It is mandatory that local government bonds with a credit rating of AA or above can be issued. The stricter rigid rating of rating agencies on institutional conditions of bonds lacks objectivity, fairness and comprehensiveness in considering risks, and is not linked to the information on the financial status and repayment ability of local governments, and rating fees are paid by the rated governments, resulting in the fact that bonds face greater credit risks. From 2019 to 2023, China will have more than RMB 1 trillion of due local government bonds to be repaid each year; the total amount of principal and interest repaid for local government bonds is expected to reach RMB 1.7 trillion in 2023. Obviously, the high risk of local government debts is closely related to the imperfect issuance system for local government bonds, the opacity of government debts, the lack of an information disclosure system, the lack of a sound risk early warning and crisis disposal mechanism for government debts, and the serious insufficiency of local fiscal revenue capacity.

2. Data island and policy arbitrariness are prominent in government credit

Strengthening the construction of government credit is an important part of the construction of the government credit system. The construction of government affairs integrity requires the government to optimize the supporting capacity of government credit services through the construction of an integrated government affairs credit service platform under a unified social credit system, enhance the standardized development capacity through the standardization of government affairs, enhance the capacity of credit process restraint by strengthening the supervision of power operation, enhance the collaborative governance capacity through interconnection and credit information sharing, and enhance the ability to provide intelligent services through the opening and application of government data. At present, China has unified the social credit code system from legal persons and other social organizations, and the personal credit code system with personal ID card as the only symbol, forming the basis for the credit information sharing platform. Work measures vigorously implemented at the national level, such as government affairs information disclosure, Internet + government affairs, and big data market regulation, are all important contents of the construction of government affairs integrity. However, the whole-process record information of government affairs activities and the credit information of legal persons, social organizations and individuals in the management mechanism for government affairs integrity are scattered on the platforms of government departments, and there is no unified credit information code of government affairs subjects as a symbol to realize the sharing and interconnection of government affairs credit information on platforms. Therefore, it is not conducive to the effective credit analysis, evaluation, monitoring and use of government affairs data to improve national governance capacity. Meanwhile, the policy instability and the arbitrariness of policy changes brought by the change of some local government officials upon expiration of office term have also consumed huge social resources and damaged government credit.

3. Out-of-order tax collection and financial arrears in fiscal and tax credit occur from time to time

Fiscal and tax credit is to solidify the benefit distribution relationship between the government and tax payers through the national tax and fee system. In essence, socialist tax is "taken from the people", and then "used to the people" through the government's provision of infrastructure and public services. However, in the case of the insufficient tax source and tax base, there may be a situation that the government uses taxes and fees to compete with the people for benefits. In some economically backward areas, due to the dual impact of industry hollow and the COVID-19 epidemic, governments at county and township levels have seriously insufficient fiscal revenue and expenditure capacity and borrowing capacity, coupled with the comprehensive implementation of the tax and fee reduction policy in the country, further increasing fiscal pressure at county and township levels. With the reduction of transfer payments from the central government, some local governments that originally guarantee operation with financial funding either delay tax reduction, or set additional fee or fine items in order to meet financial rigid payments, disrupting the national tax and fee order. Some local governments that are unable to complete rigid payments can only resort to arrears of project payments to private enterprises, funds for infrastructure financial bid invitation and bidding, and even salaries to civil servants and teachers, seriously damaging the credibility of local governments.

**Dual Impact of Fiat Digital Currency on the Reform of China's Government Credit System**

Digital technology is the cornerstone of the development of digital economy, while fiat digital currency is the accelerator of the development of digital economy. As a new preparatory member of China's social money supply system, fiat digital currency will replace M0 to play payment and value storage functions, which may have the dual impact on China's government credit system.

1. Positive impact of fiat digital currency on the reform of the government credit system

Under the strong support of digital technology, the promotion of fiat digital currency, a more efficient payment and settlement tool, will inevitably force the reform of the government credit system and reshape the government credit system compatible with it. Specifically, there are four main aspects:

Firstly, promotion of digitization of financing in the government credit system. Regardless of whether the government raises funds from the central bank, commercial banks or the private sector, it will rely on the transfer of funds from digital currency wallet accounts of different subjects to the digital currency wallet account of the government, which requires the reconstruction of the management system for the government credit account, bookkeeping system and interest rate calculation system.

Secondly, promotion of digitization of investment in the government credit system. Regardless of government direct investment or transfer payment, in the future digital currency circulation, government investment will apply digital technology and fiat digital currency to the end of investment projects to complete the payment and circulation of government investment funds, so that the government's financial expenditure can be transferred between accounts or wallets depending on the digital account management system for different subjects. This is not fundamentally different from the current transfer and settlement relying on deposit accounts, but the account management and regulation method have changed. In this case, it is necessary to establish a new regulatory system for transfer and assessment of government credit funds, innovate in government credit regulation technology, and promote the digitization and informatization of government credit and fiscal revenue and expenditure regulation.

Thirdly, impact of fiat digital currency on government credit settlement payment methods. The change from traditional deposit transfer and physical cash payment to transfer payment through digital currency wallets requires the construction of the interconnected digital currency transmission infrastructure and account management system between the government and the banking system, and the promotion of infrastructure digitization of the government credit system.

Fourthly, impact of fiat digital currency on the cost of government credit investment and financing. Fiat digital currency has a huge cost saving advantage in payment calculation, which is conducive to reducing the printing cost of paper bonds issued by the government. The government can also issue digital government bonds, create digital liability accounts and digital asset accounts, and realize the account connection with banks and borrowers, so as to help the transfer and regulation of fiat digital currency between different accounts, and also help to reduce the information asymmetry between parties to the investment and financing and credit risks through the traceability of digital currency.

2. Negative impact of fiat digital currency on the reform of the government credit system

The promotion of fiat digital currency will inevitably impact the operation order of the existing government credit system. China's existing government credit system is based on the traditional physical money supply settlement system. Before the promotion and the connection of the technology system it relies on with the government credit system, fiat digital currency will occupy the currency resource base of the traditional government credit system and squeeze the operation space of the existing government credit system; at the same time, the promotion of fiat digital currency will not only accelerate the currency circulation in real economy, but also contribute to the rapid development of digital economy. However, digital economy has a partial transfer effect on the tax source of real economy (such as e-commerce).

In the case that the tax system for digital economy has not been established, the existing government credit system, especially the local government credit system, will inevitably lose some tax sources and taxes, increasing the credit burden of local governments.

# CHAPTER 5

# POLICY RECOMMENDATIONS

In the future construction of the social credit system, we should pay great attention to the possible impact of digital currency, instruct digital currency to give full play to its advantages and release its effectiveness in the construction of the social credit system, and effectively prevent new shocks and negative impacts on the social credit system.

## Better Play the Role of Digital Currency in Reconstructing the Modern Social Credit System

Firstly, cherish the value of credit in the modernization of the national governance system and governance capacity in the digital era. The basic role of credit value in the digital society will be further highlighted. We should attach great importance to and research credit value as soon as possible, systematically analyze the impact of digital currency on national credit, government credit, market credit, and social credit, pay attention to the dynamics of international organizations, other sovereign countries, and commercial institutions in the field of digital currency, and strengthen the top-level design of social credit policies in the era of digital currency. We also should take the use of digital currency as an opportunity to innovate the form of credit popularization and promotion, strengthen the social value of credit, generally enhance the awareness of integrity of the whole society, improve the overall credit environment for economic and social development, serve the high-quality development of economy, social harmony and order, and promote the modernization of the national governance system and governance capacity. In addition, we should establish a sense of credit security, track and pay attention to the connection among digital currency, credit information and all aspects of economy and society, pay attention to regulation technology and digital currency wars, lead the formulation of the relevant international regulations, and consolidate the defense line of credit data in financial security and national security.

Secondly, strengthen the construction of the legal system for social credit in the era of digital currency. We should accelerate the research and formulation of basic laws, regulations and standard systems for social credit in the digital currency era, and leave room in the existing relevant regulations and standards for new situations and new measures of the social credit system in the digital currency era. We should also strengthen the legislation on the use of digital currency and the social credit system, strictly restrict the scenarios on the inquiry and use of institutional or individual payment information, especially real identity, such as the inquiry and use of the period of data generation with time limit only in a few cases such as suspected crime, limit the scope of social relationship networks where payments occur, strengthen the punishment for privacy disclosure, and intensify the constraint on public power. In addition, based on the governance concept, we should clarify the repair mechanism for social credit, to ensure that the credit system maintains a reasonable balance between binding force and inclusion.

Thirdly, comprehensively reconstruct the social credit system based on digital currency. Around the impact of digital currency, we should, with the digital credit system as the core, re-clarify the credit regulation responsibilities of departments in charge of development and reform, cyberspace, and industry and information technology, and the People's Bank of China, improve the credit service market system, and strengthen risk prevention and control in the field of financial technology. The Party and government systems should take the lead in complying with social credit requirements, fulfilling credit commitments, rationally using credit data in accordance with laws and regulations, strictly holding the relevant parties accountable for credit, and strengthening punishments for government dishonesty. It is necessary to establish a digital mechanism of giving incentives to acts in good faith and punishments to acts in bad faith led by the government and based on the market. Government departments should strengthen the awareness of digital equity and inclusion, integrate the concept of "digital friendliness" into all policies, design more solutions, introduce digital currency barrier-free regulations, bridge the digital divide, and protect the interests of digitally vulnerable groups such as the elderly. They should actively draw on the experience of Europe and the United States, formulate medium- and long-term development plans, establish a unified digital skills strategy, set up digital technology service centers, and offer free computer and digital courses for literacy elimination, with focus on digital literacy elimination for the elderly and low-income population. They should also actively develop social organizations in the digital field, and promote public welfare research and services in the fields of digital currency and digital credit.

Fourthly, strengthen the research and development of the application of digital technology in the field of social credit. The advantages of digital currency in the reconstruction of the social credit system largely benefit from technological innovation, while the risks and challenges digital currency brings to the social credit system also include technical risks. It is particularly critical to strengthen the research and development of the application of digital technology in the field of social credit. It is necessary to strengthen the research and development of blockchain technology, improve data storage, dissemination and encryption technologies, vigorously develop the BSN, constantly improve the security of digital currency and digital credit, and further reduce the application cost of blockchain technology. Efforts should be made to strengthen the combination of blockchain with big data and Internet of Things technology, improve the convenience and security of digital currency, and expand the coverage of digital currency. In addition, we should, based on such technologies as blockchain, big data, Internet of Things, and artificial intelligence, and using digital currency as the medium, establish a whole-process and whole-coverage social credit data system covering the whole population of all sectors in all industries and all subjects at all levels, strengthen the cross-system, cross-department, and cross-level sharing of data, and further break data barriers.

**Accelerate the Innovation and Development of Digital Currency in the Construction of the Social Credit System**

Firstly, give play to the government's leading role in the innovation of digital renminbi integration into the social credit system. The development of digital renminbi should be incorporated into social credit-related laws, regulations and standards systems of departments at all levels, and regions where conditions permit are encouraged to incorporate digital renminbi into local development plans. The digital renminbi liaison agency should be set up under the Big Data Bureau (Center) to jointly promote the reconstruction of the social credit system with departments in charge of finance, public security, and industry and commerce. We should make full use of the regulatory features of digital renminbi, promote the formulation of a catalog of public credit information and a list of disciplinary measures for dishonesty, and improve the credit repair mechanism for subjects breaking faith. Efforts should be made to strengthen the collection, sharing, disclosure and application of credit information related to digital renminbi, and promote credit products and services benefiting people and facilitating enterprises. The legal system for digital renminbi should be improved to provide institutional guarantee for the issuance, circulation, management and use of digital renminbi. A mechanism for sharing and integrating public credit information and financial information should be established relying on the pilot reform of digital renminbi. The credit information security management of digital renminbi should be strengthened, to protect the legitimate rights and interests of digital renminbi users.

Secondly, give play to the basic role of market players in innovating digital renminbi and improving the social credit system. We should accelerate the construction of a number of domestic leading and international first-class enterprise credit investigation agencies and credit rating agencies, and incorporate digital renminbi information into the scope of credit investigation services. We should also develop a digital currency credit system covering all types of market players, improve digital renminbi records in credit records of social members, perfect the mechanism for giving incentives to acts in good faith and punishments to acts in bad faith based on digital renminbi, strengthen credit regulation, enhance incentives to acts in good faith, increase the cost of breaking faith, and promote the healthy and rapid development of the credit service market. In addition, we should expand the application of digital renminbi in integrity scenarios, and constantly expand the credibility and influence of digital renminbi; optimize the path of digital renminbi innovation, and promptly identify and respond to new risks in the issuance, circulation and regulation of digital renminbi; strengthen the construction of financial infrastructure, accelerate the development of the digital industry, and increase investment in the research and development of digital renminbi technology; support the development of a number of digital financial enterprises, and create a market environment for the reconstruction of the social credit system.

Thirdly, mobilize all kinds of social subjects to participate in the reconstruction of the social credit system in the digital era. In the process of promoting digital renminbi, we should encourage and mobilize the participation of social forces, form a joint force for the construction of a social credit system, increase the publicity of integrity, enhance the awareness of integrity in the whole society, and improve the credit environment for China's economic and social development. Schools, communities and social organizations should be encouraged to carry out the relevant education and training, especially to popularize digital renminbi knowledge among young people and the elderly, so as to enhance the integrity of the whole people. The relevant research institutions are encouraged to summarize typical cases and successful experiences of "double pilot" cities in a timely manner, increase research on the integration of digital renminbi into the social credit system, and establish a typical integrity. The training of professionals related to digital renminbi and social credit shall be accelerated, to provide strong talent support for the reconstruction of the social credit system.

**Continue to Deepen the Reform of the Government Credit System With the Development of Digital Currency**

Firstly, build a government digital credit operation system in combination with the operation mechanism of fiat digital currency. We should strengthen the connection with the banking system and the new money supply mechanism from such aspects as organizational restructuring, framework design and connection of digital credit system, account management, and risk management, strengthen the construction of the legal system for the government digital credit system, and promote the digital and intelligent treasury management. Promoting the digitization of government credit requires the promotion of smart government, information government, and digital government projects, and realization of the effective transfer and account management connection of digital currency from the central bank, commercial banks, and market players to the government. In addition, it is necessary to strengthen the construction of the facility system for government credit operation supported by digital credit information highway, storage equipment, account management, distributed account storage, controllable risk and traceable digital currency, and consolidate the foundation for digital government credit.

Secondly, innovatively develop government digital credit products and build a green government credit system in combination with the advantages in the use of fiat digital currency. We should, relying on the convenient payment and settlement advantages of digital currency, explore government credit products suitable for it, such as trying to develop anonymous negotiable digital treasury bills, digital national bonds, digital municipal bonds, and real-name medium and long-term digital national bonds, explore the issuance and management operation mechanism for digital national bonds and the way of interest payment and repayment, reduce the cost of government credit financing, improve financing efficiency and build a green credit system. We should also accelerate the establishment of a tax system for digital economy, and promote the sound development of digital currency, digital economy and digital tax.

Thirdly, actively explore digital payment systems and regulatory systems for digital tax, digital non-tax income and financial expenditure in combination with the circulation conditions of fiat digital currency. We should accelerate the digitization process of the government's tax collection and administration and financial payment application system, build a digital tax collection and non-tax income payment account system with the help of payment means of fiat digital currency and the circulation technology system for digital currency, strengthen the connection of digital currency accounts and digital deposit accounts between the government and market players, and promote the effective transfer of fiscal and tax funds among the corresponding digital accounts. We should also accelerate the research and development, promotion and application of digital credit technology, connect with intelligent government affairs projects, and realize the digitalization and intelligence of government financial revenues and expenditures, management account system and risk traceability. In addition, we should explore the digital and information technology-based two-line regulation mode of financial revenue and expenditure, learn from international and domestic advanced practices, build a new digital sandbox regulation mechanism under the operation of fiat digital currency, and strengthen the regulation of credit risks and sovereign debt risks of foreign debts.

Fourthly, strengthen the construction of the legal system for digital government credit in combination with the characteristics of fiat digital currency. We should strengthen institutional supply and institutional innovation, and lay the legal and policy guarantee foundation for the promotion of digital currency; revise laws and regulations on government credit management, clarify the normative operation contents of government credit subjects, objects, carriers, management and operation mechanisms and modes, and risk regulation under the era of digital economy and digital currency, promote the rule of law and standardization of digital government credit, reduce the cost and risk of digital government credit, and improve the efficiency, effectiveness and benefit of digital government credit, and better serve the national economy and the people's livelihood; continue to promote the formation of teams with backgrounds in computer science, law, economics and other disciplines to study the legislation related to digital currency and enrich the existing monetary policy and legal system; improve the legal rules and policy system for digital currency, clarify the work division framework for legal and government regulation, and the behavior standards for digital currency in the issuance, circulation, and use process, and enrich the law enforcement regulation team for digital currency; increase input in institutional supply, optimize the consultation mechanism for the collaborative governance system, improve the overall framework design of the credit system, pay attention to preliminary research and institutional reserves, cultivate professional institutional credit supply research institutions, establish the institutional demand feedback mechanism, and encourage local department to pilot and explore the digital currency innovation system. The central bank should establish a credit information and data management institution with credit institutions to manage credit information and data of fiat digital currency in a standardized manner in accordance with the law. The laws and regulations regulating credit information disclosure should be formulated. The credit information and data management institution should manage the ownership and use right of data and information generated by the circulation of fiat digital currency in a standardized manner, and have the right of information inquiry and use right according to legal procedures; the credit information and data management institution should retrieve transaction information and data of citizens according to work needs, and strictly examine the application of other authorities for information inquiry, to ensure the legitimacy of procedures.

## REFERENCES


[1] D. Chaum, Blind signatures for untraceable payments: CRYPTO '82, p. 199-203. Plenum Press, 1982.

[2] Yoshizawa M , Yuda M , Nakamoto S , et al. Effects of Postovulatory Egg-Aging in Oviducts on Incidences of Chromosomal Aberrations and Primary Sex Ratios in Mouse Eggs Fertilized In Vitro[J]. Nihon Chikusan Gakkaiho, 1995, 66(11):918-926.

[3] Kumhof M , Noone C . Central Bank Digital Currencies - Design Principles and Balance Sheet Implications[J]. Social Science Electronic Publishing, 2018.

[4] Stetsko Y P , Keister J W , Suvorov A , et al. SPIE Proceedings [SPIE SPIE Optical Engineering Applications - San Diego, California (Sunday 21 August 2011)] Advances in Computational Methods for X-Ray Optics II - Dynamical modeling of high-energy-resolution x-ray optics[J]. 2011, 8141:81410R-81410R-13.

[5] Walter Engert, Ben S. C. Fung. Central Bank Digital Currency: Motivations and Implications. Staff Discussion Paper/Document personnel 2017-16, ISSN 1914-0568.Government of Canada - Department of Monetary and Financial Analysis, Bank of Canada, November 30, 2017.

[6] Frankel, A. S. (1998). Monopoly and competition in the supply and exchange of money. Antitrust Law Journal, 66(2), 313-361.

[7] Barontini, C., and Holden, H. 2019. Proceeding with caution-a survey on central bank digital currency. BIS Papers No. 101, Monetary and Economic Department, January 2019.

[8] Yi Yan, Raphael Auer Giulio, Cornel li, Jon Frost. Rise of Central Bank Digital Currency: Drivers, Institutional Framework, and Technical Path. China Money, 2020, 11(229): 70-73.

[9] Khiaonarong M T , Humphrey D . Falling Use of Cash and Demand for Retail Central Bank Digital Currency[J]. IMF Working Papers, 2022.

[10] Auer R , Boar C , Cornelli G , et al. CBDCs beyond borders: results from a survey of central banks[J]. BIS Papers, 2021.

[11] Agustín Carstens a, Moisés J. Schwartz b. Capital flows and the financial crisis in Mexico[J]. Journal of Asian Economics, 1998, 9(2):207-226.

[12] Yao Qian. Optimization of Current Currency System by Fiat Digital Currency and Its Issuance Design. Studies of International Finance, 2018(4): 3-11.

[13] Guan Yiming, Wu Xuchuan. Development of Digital Currency: Typical Characteristics, Evolutionary Path and Regulatory Guidance. Financial Economics Research, 2020(3): 130-145.

[14] Feng Yongqi, Liu Ren. Trends, Countermeasures and Development Trends of Financial Governance under the Impact of the COVID-19 Epidemic. Financial Economics Research, 2020(3): 51-61.

[15] Liu Kai, Guo Mingxu. Issuance Motivation and Design Scheme of Central Bank Digital Currency and Its Implications for China. International Economic Review, 2021(3): 137-154+7.

[16] Zhuang Lei, Zhao Chengguo. Effect of Financial Innovation: A Study on Macro Efficiency of Internet Finance. International Business (Journal of University of International Business and Economics), 2017(6): 121-131.

[17] Chen Chunzhu, Li Zhaolin. Third-party Payment Money Laundering: Characteristics, Risks, Punishment Difficulties and Countermeasures. Chongqing Social Sciences, 2020(10): 66-78.

[18] Bian Qing. Blockchain: Reconstructing the Social Value Credit System. Internet Weekly, 2017(16): 29-30.

[19] Lu Minfeng. Future Development Prospects, Reform and Reconstruction of Commercial Banking under the Background of Digital Currency. Southwest Finance, 2020(9): 3-13.