

Digital currency in China: pilot implementations, legal challenges and prospects

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Abstract

Digital currency is supported by blockchain as the underlying technology, and possesses the characteristics of decentralization, programmability, and security verification based on cryptographic principles. In fact, it can be divided into legal digital currency and non-legal digital currency depending to whether the digital currency is issued by the competent authority. China's legal digital currency (DC/EP) has implemented early and already has a certain scale of development. This article examines the legal issues that arise from the implementation of a legal digital currency in China, issues that Chinese lawmakers inevitably face. These legal issues may arise at both domestic and international levels, such as personal privacy protection, currency sovereignty conflicts, potential cross-border crimes risks. This article emphasizes that on the one hand, the development of legal digital currency must be carried out within a reasonable legal framework to avoid new systemic risks caused by the development of technology. On the other hand, it is also necessary for China to put in place as soon as possible an appropriate legal framework, explore the international cooperation of diversified supervision as well to ensure the healthy development of legal digital currency.

Keywords: Central Bank Digital Currency (CBDC), DC/EP, legal challenges, financial supervision, international cooperation.

JEL Classification: K22, K33

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1. Introduction

In recent years, the rapid development of financial technology and blockchain technology has brought many changes to the field of payment and settlement. According to the definition given by Satoshi Nakamoto that Bitcoin is an electronic currency supported by blockchain as the underlying technology, thus carve out the way for the birth and development of digital currency.³ Different from any form of digital assets in the past, digital currency has the following characteristics, decentralization, programmability, and based on security verification

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³ Satoshi Nakamoto, *Bitcoin: A Peer-to-Peer Electronic Cash System*, 9.

with cryptographic algorithms.⁴ The digital currency represents a larger category. It actually contains several types of digital currency including virtual currency, cryptocurrency, central bank digital currency (CBDC). One of the major international Internet giants Facebook proposed the Libra project (one of the famous cryptocurrencies, now renamed Diem) with the intention of creating a non-sovereign, value-stable digital cryptocurrency, which has attracted the attention of central banks of various countries. Under this context, the central banks of many countries, including China, have established plans to issue a legal digital currency, which means that the central banks will directly provide a digital payment tool to replace cash, reduce transaction costs and currency issuance costs so that the payment efficiency could be improved.⁵ Legal digital currency, also known as central bank digital currency, refers to the legal tender issued by the central bank of a country or its authorized commercial banks, relying on technologies such as blockchain, and existing in the form of digital information.⁶ The Bank for International Settlements (BIS) divides legal digital currency into three branches, two of them are token-based and the other is account-based.⁷

The People's Bank of China (PBOC) is one of the first central banks in the world to develop digital currency and has launched its own digital currency after a series of pilots' experimentation, DC/EP, which stands for Digital Currency Electronic Payment. DC/EP's issuance implies both challenges and opportunities for China, it will be involved in many legal problems both on domestic and international levels. This article mainly focuses its current situation on China and tries to analyze the legal challenges from both domestic and international perspectives and how this type of currency will develop in a long-term.

2. The development of CBDC&DC/EP in China

The DC/EP, Digital Currency Electronic Payment is literally a combination of digital currency issued by the central bank and at the same time an electronic payment system. On the one hand, it includes the digital currency issued by the PBOC, and on the other hand, it also includes the digital currency electronic payment system jointly participated by the central bank, commercial banks, enterprises, as well as individuals. The electronic payment system does not have a preset technical route, and commercial banks can either adopt the blockchain technology or the secure and effective technical frameworks such as electronic account systems, electronic payment tools, and mobile payment tools as the technical conditions for their operation. As a digital payment tool with value characteristics and M0 attributes

⁴ Yanchao Yang, *On the Legal Attributes of Digital Currency*, "Chinese Social Science", Rev.1, 2020, at 85.

⁵ Yifei Fan, *The Theoretical Basis and Architectural Choice of China's Legal Digital Currency*, "Chinese Finance", Rev.17, 2016, at 10.

⁶ Shaojun Liu, *Financial Law*, China University of Political Science and Law Press, 2016.

⁷ Benoît Cœuré & Jacqueline Loh, *Central bank digital currencies*, 34, <https://www.bis.org/cpmi/publ/d174.pdf>.

issued by the PBOC⁸, DC/EP has the same functions and attributes as banknotes, except that it is presented in a form of digitalization. Compare with the CBDC projects in other countries like *Jasper* in Canada, *Ubin* in Singapore, *RScoin* in UK etc., DC/EP has already in a leading position in the world not only in theory research but also in the domain of technology design and practical application. The following graph shows its R&D process and some pilot applications.

Timeline	R&D process and pilot applications
2014	The PBOC has established a special research group on legal digital currency, conducted research of digital currency on issuance, circulation, and organizational structure, etc.
2016	The PBOC held a seminar on digital currency, officially launching the research on legal digital currency in China
2017	The State Council approved the PBOC to take the lead to some commercial banks and relevant institutions to jointly develop digital RMB; The PBOC officially established the Digital Currency Research Institute
2018	The Digital Currency Research Institute of the PBOC established "Shenzhen Financial Technology Co., Ltd." which is an important symbol of legal digital currency from research to practice
2019	The PBOC pointed out at the work video conference that the key work in the second half of the year is to accelerate the pace of research and development of digital currency in China and pursue follow-up research on the development trend of virtual currency in foreign countries. Guidelines of the Communist Party of China (CPC) Central Committee and the State Council on Supporting Shenzhen in Building a Pilot Demonstration Area of Socialism with Chinese Characteristics proposed that supporting the development of innovative applications such as digital currency research and mobile payment in Shenzhen.
2020	The PBOC's Digital Currency Research Institute announced that it will conduct closed pilot tests of digital currency in Shenzhen, Suzhou, Xiong'an New Area, Chengdu and the Winter Olympics scenarios later as well. The Shenzhen Municipal Government and the PBOC jointly launched a digital RMB red envelope pilot, which is the first test of the PBOC digital currency for the public.
2021	Pilot activities have been successively carried out in Beijing, Shenzhen, Shanghai, Chengdu and other places, and the application scenarios have been

⁸ Mu Changchun, director of the PBOC Digital Currency Research Institute, said that the current design of the CBDC focuses on the replacement of M0 rather than the replacement of M1 and M2. Because M1 and M2 have been electronically and digitized, there is no need to use digital currency to realize digitization. In contrast, the existing M0 (banknotes and coins) are easy to be forged anonymously, and are used for money laundering, terrorist financing, etc. The design of the CBDC maintains the attributes and main characteristics of cash and meets the needs of portability and anonymity. It is a better tool to replace cash. Changchun Mu, *Mu Changchun talks the Central Bank Digital Currency*, First Financial (Aug.11,2019), https://www.sohu.com/a/332951005_114986. Zihao Huang, *Mu Changchun: The "controllable anonymity" of the digital RMB reflects the M0 positioning and is also an objective need to maintain financial security*, Shanghai Securities News, (Mar.20,2021), <https://news.cnstock.com/news,bwxx-202103-4674916.htm>.

Timeline	R&D process and pilot applications
	continuously expanded, including shopping malls, retail stores, hospitals, public transportations, etc. In addition to some large state-owned commercial banks, Ant Group affiliate MYbank and Tencent affiliate WeBank will also become operators of digital RMB. The expansion of operating institutions marks a big step in those pilot activities.
2022	On January 4, the digital RMB (pilot version) application was officially launched on the Apple App Store and Android app stores and made available for download, it can be used in those pilot cities including the Winter Olympics areas.

Figure 1. Arranged according to data online.

On November 27, 2020, during the seminar on "Digital Finance Innovation and New Pattern of Economic Development" held by the Digital Finance Research Center of Peking University, the President of the China Society for Finance and Banking and former Governor of the PBOC Mr. Xiaochuan ZHOU further clarified that the relationship between DC/EP, digital yuan (e-CNY) and CBDC.⁹ To put it simply, CBDC is a general designation of digital legal tender that issued by the central banks or the other official organizations, while DC/EP corresponds to the digital currency project of PBOC, and e-CNY represents a product in the project of DC/EP and was launched and promoted in an increasing numbers of application scenarios (See Figure 2).

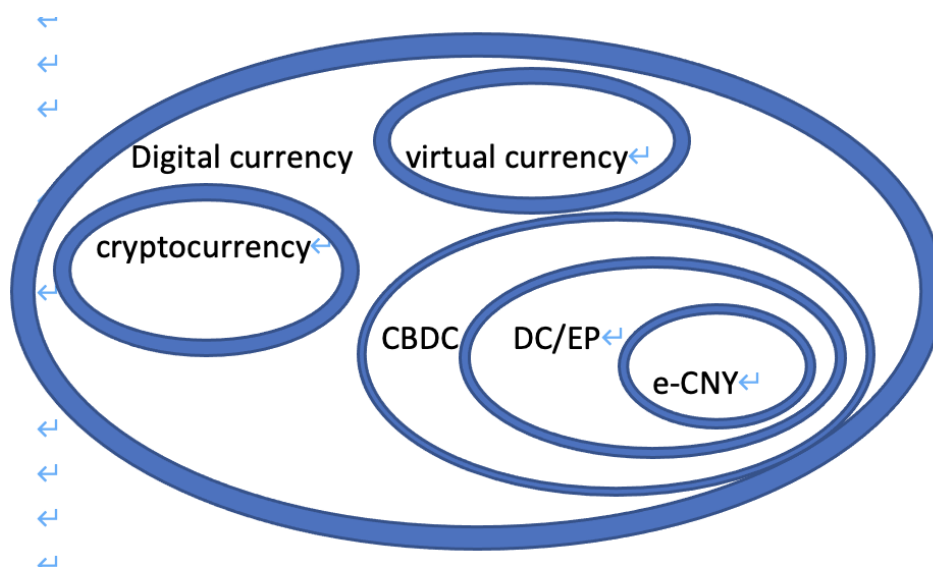


Figure 2. The relationship among digital currencies

⁹ Zhou Xiaochuan: *A competitive with multi-plan system for central bank digital currency is more suitable for China*, Sina Finance (Dec.20,2020), <https://finance.sina.com.cn/china/gncj/2020-12-01/doc-iiznezxs4698928.shtml>.

The legal digital currency can adopt the centralized issuance mechanism of single-tier or two-tier system. For the single-tier system, the central bank directly issues and provides services to the public. The two-tier system places commercial banks at the front and the central bank behind the scenes. The central bank issues legal digital currency to commercial banks, and then commercial banks provide services to the public.¹⁰ China currently follows a two-tier operation architecture, in other words, the central bank issues legal digital currency to designated operating agencies, and the designated operating agencies are responsible for exchanges and circulations.¹¹ The most fundamental difference between legal digital currency and private digital currency such as Bitcoin is that the former is issued by the central bank, and there is no "decentralized" issuance mechanism like Bitcoin and the corresponding monetary total limit.¹² At present, the Chinese central bank plans to adopt the "loosely coupled" model, which is on the basis of the traditional bank account system, the digital currency wallet is introduced into the bank account, so that a bank account can manage both the deposit currency and the digital currency.¹³ According to the design concept mentioned above, the operation mechanism of China's digital currency is shown in the following figure.

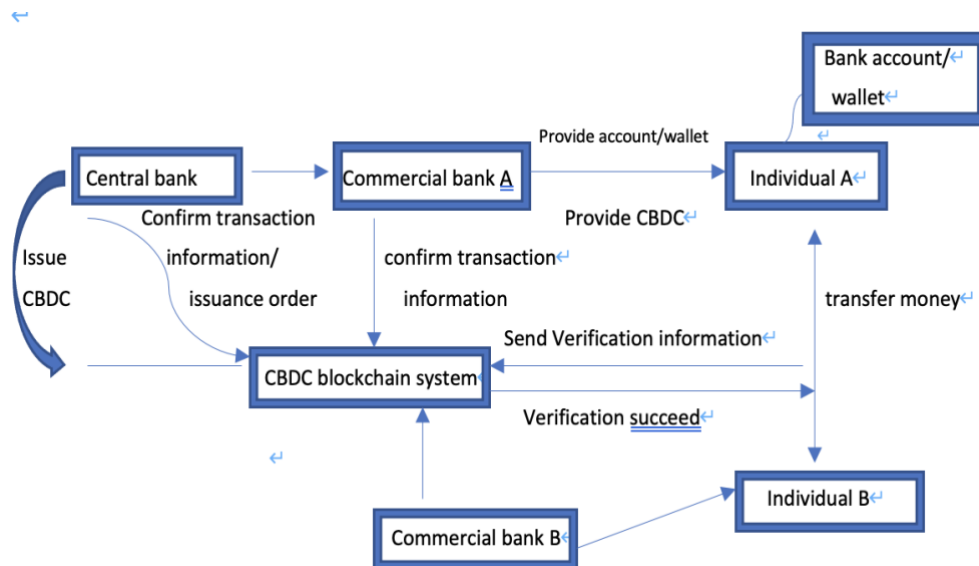


Figure 3. Schematic diagram of the issuance and circulation of CBDC in China

¹⁰ Benqi Ouyang & Yunfeng Tong, *The Logic and Limits of legal Governance of Digital Currency in the Blockchain Era*, "Academic Forum", Rev.1, 2021, at 105.

¹¹ PBOC Digital RMB R&D Working Group, White Paper on R&D Progress of China's Digital RMB (July 2021), <http://www.pbc.gov.cn/goutongjiaoliu/113456/113469/4293590/2021071614200022055.pdf>.

¹² Benito Arrunada, *Blockchain's Struggle to Deliver Impersonal Exchange*, 19 MINN. J.L. SCI. & TECH. 55-106, 2018.

¹³ Qian Yao, *A Glimpse of Digital Money 312*, China Financial Press, 2018.

With the rise of the digital economy, the mobile payment cannot be ignored. According to the statistics, the number of online payment users in China has reached 870 million as of June 2021, accounting for 86.3% of the total netizens. In the third-party mobile payment market, Alipay and WeChat Pay occupied a dominating position. According to iResearch's "2020Q2 China Third-Party Payment Market Data Release Report", the combined market share of these two goes up to as 94.4%.¹⁴ In the operations of Alipay, WeChat and other third-party payment platforms, after the transaction occurs, the buyer uses the payment platform to notify the account opening bank to make payment for the goods, and the bank debits from the buyer's account. After that, the platform will notify the seller to deliver the goods. After the buyer receives the goods, the three-party payment platform pays and informs the bank to credit the relevant amount to the seller's account (the bank Card). Therefore, Alipay and WeChat are only payment platforms, and they still need to be bonded to a bank card to be able to be used. Therefore, they simply represent payment tools, not money and in fact, no digital currency is generated in this process, but only the settlement of transactions between banks and customers was facilitated. While the digital currency itself is money. Although some experts consider that e-CNY will not affect the status of Alipay or Wechat, it cannot be excluded completely. From the figure 2 above, the operation of DC/EP has already started the cooperation with the commercial banks of Ant's Group and Tecent. Maybe in the future, the e-CNY can also be used with traditional currency on those third-party payment platforms in consideration of the convenience of transactions. Because the CBDC will not replace the traditional currency, as China will implement concurrent policy of those two types on the long-term.

3. The legal challenges and risks of DC/EP

With the rapid development of CBDC in China, the establishment of a legal framework capable of meeting the requirements of this development is now a necessity and should be placed on the legislator's agenda, since the DC/EP need to face the legal challenges and risks on both domestic and international level.

3.1 The potential legal challenges

3.1.1 The legal deficiency

By the end of 2021, there were more than 8,085,100 digital RMB pilot scenarios in China, 3,625,000 digital RMB merchants, and reached a transaction volume of 87.565 billion yuan. Whether it is the number of merchants and personal wallets in the pilot scenarios, or the opening of public wallets, the number of

¹⁴ *A new payment method is born, Alipay's biggest rival is not WeChat*, Digital Finance (Dec.01, 2021), https://www.sohu.com/a/504853883_100120495.

transactions and the total amount, they are increasing rapidly.¹⁵ It can be seen that the official issuance of digital currency in the near future will be a revolutionary change to the entire financial system and even the whole society, but its sustainable and healthy operation is inseparable from the constraints and guarantees of the legal system. Legal tender is a currency specially regulated by national or regional laws and has unlimited legal compensability for payment and settlement. In China, the current legal currency corresponds to the RMB, which specifically refers to the RMB in the form of legal banknotes and coins. Its unlimited legal payment and settlement effect is guaranteed by the "*Law of the PRC on the People's Bank of China*" (hereinafter referred to as *Law on the PBOC*).¹⁶ The central bank has always oriented the digital RMB as a digital form of legal tender issued by the PBOC. As a nascent and emerging thing, China's sovereign digital currency hasn't officially been mentioned in laws and regulations yet, but still publicly appeared in reviews and documents like the White Paper.

At present, according to the *Law on PBOC*¹⁷ and *Regulation of the People's Republic of China on the Administration of RMB*¹⁸ (hereinafter referred to as the Regulations on the Administration of RMB), the PBOC is authorized to issue RMB, manage the circulation of RMB on behalf of the State, and exercise the power to issue currency. One of the key points of the central bank's digital currency design concept is to follow the management of traditional currency, and the issuance and withdrawal are based on the current dual system of "central bank-commercial bank".¹⁹ However, according to the current law, the currency form of RMB should stay as physical currency, with banknotes and coins as its material carrier, excluding the issuance of intangible digital currency. Therefore, the current digital currency issued by the central bank is not within the scope of the RMB stipulated in the Law on the PBOC. In addition, the "law on the PBOC" and "the Regulations on the Administration of RMB" have clearly stated the requirements for the printing and distribution of RMB, while the digital currency does not need to be printed and distributed physically, the relevant laws and regulations have not been revised and give regulations in detail.

Nevertheless, it doesn't mean the issuance of China's digital currency can be qualified as disordered. On October 23, 2020, the central bank solicited public comments on the *Law of the PRC on the People's Bank of China (Revised Draft for Comment)*, in which it stipulates that RMB includes both physical and digital forms.²⁰ This exposure draft shows an official attitude of its direction for further

¹⁵ *Digital RMB is approaching*, Economic Daily (Mar.13,2022), http://www.news.cn/politics/2022-03/13/c_1128465510.htm.

¹⁶ Shaojun Liu, *Study on the Legal Principles and the Distribution of Rights and Duties of Legal Digital Currency*, "Journal of CUPL", Rev.3, 2018, at 165.

¹⁷ Law of the People's Republic of China on the People's Bank of China, art.4 (2004).

¹⁸ Regulation of the People's Republic of China on the Administration of RMB, Reg.2 (Mar.19,2018).

¹⁹ Qian Yao & Yingwei Tang, Some thoughts on the central bank's legal digital currency, "Financial Research", Rev.7, 2017, at 78.

²⁰ *Law of the PRC on the People's Bank of China (Revised Draft for Comment)*, The People's Bank of China (Oct.23,2020), http://www.gov.cn/zhengce/zhengceku/2020-10/24/content_5553847.htm.

legislation and has provided a legal basis for the issuance of digital RMB. After the successful adoption of the act, the digital RMB can justifiably become China's legal currency. However, there is still a long way to go from the exposure draft to its formal implementation.

3.1.2 The absence of concrete regulations of protection on unlimited legal tender

The public law attribute of legal digital currency is the most essential feature that it can be distinguished from private digital currency. Legal tender is one of them, which reflects the function of currency as a tool of state intervention in the modern market economy.²¹ The legal solvency attribute refers to the "general usefulness" of the currency²², which means that legal tender correspond to the only legal currency for pricing and settlement in the country. When the holder of legal digital currency uses it to pay debts, the other party shall not refuse to accept the payment of digital currency.²³ According to *the Law on PBOC* and *Regulations on the Administration of RMB*, no unit or individual may refuse to pay all public or debts in legal currency in China. This reflects that traditional physical currency represents the credibility of the country and has the characteristics of unlimited legal tender. The definition of digital RMB given in the White Paper on R&D Progress of China's Digital RMB (hereinafter refer as to White Paper of Digital RMB) also considers that digital RMB is the equivalent of physical RMB, with value characteristics and legal solvency.²⁴

However, this represents only a design concept of the central bank for digital currency so far, and there is no clear regulation through formal laws. It is particularly significant to balance the relationship between digital currency and traditional currency. Clear legal solvency means more legal protection and so that it can be accepted by more people. If digital currency does not possess the unlimited legal tender attribute of traditional currency, it will be at an obvious disadvantage in the competition with traditional currency. Due to this disadvantage, even if the digital currency is officially launched later, it will be difficult to be fully accepted in applications. At present, due to the continuous increase in the number of online payments and mobile payments, many countries in the world have begun to implement undetermined cash and coin circulation mechanisms with the aim of replacing cash currency with digital currency and achieving a "cashless country or a cashless society".²⁵ This trend may cause a great imbalance between technology-

²¹ Da Ke, *Study on the Legal Attributes of Central Bank Digital Currency*, "Science Technology and Law", Rev.4, 2019, at 57.

²² Georg Simmel, *The Philosophy of Money* 363, (Peipei Yu and al., China Social Sciences Press, 2017).

²³ Donggen Xu, *On Legal Tender-Also on the Non-legal Meaning of Electronic Currency*, "Jiangxi Social Sciences", Rev.6, 2013, at 152.

²⁴ *Id.* at 5.

²⁵ In May 2015, the Danish government unveiled a series of proposals, including plans to repeal laws requiring shops to accept fiat cash and coins. If the proposal is approved by parliament, clothing retail stores, restaurants and petrol stations will enter an era without cash and coin payments.

developed countries and those who lack infrastructure in this domain. Even in China, the current electronic network technology cannot satisfy digital currency payments under all kinds of circumstances, which is a technical challenge in a long-range. In this case, the mandatory use of legal digital currency will have a problem of depriving the public of the right to use legal cash and coins. In China, if the recipient refuses to accept legal cash and coins, it directly constitutes a violation of the *Law on PBOC* and directly denies the unlimited legal effect of legal tender.²⁶ Therefore, the legislative institutions need to further consider in practice how to stipulate the unlimited legal tender of digital currency equivalent to traditional currency. Based on this, Da KE has suggested that although legal digital currency has the property of legal solvency, it should not have the same unlimited legal solvency as traditional legal currency at this stage. In consideration of the factors such as people's habits of using legal currency, technical advancement, and the substitution effect of bank deposits, legal digital currency has unlimited legal tender should only within a certain scope of application and above a certain amount.²⁷

3.1.3 Lack of specific regulations on privacy protection

For many, the anonymity of cash is consecrated, in a way, cash and freedom are synonyms.²⁸ Controllable anonymity is included in the design concept of China's digital RMB. In fact, it follows the principle of "anonymity for small amounts and traceability of large amounts", attaches a great importance to the protection of personal information and privacy, and fully considering the characteristics of business risks under the existing electronic payment system and information processing logic so that to meet the public demand for small-amount anonymous payment services.²⁹ The digitalization and centralized features of sovereign digital currency make it no longer similar to traditional physical currency, which is no longer a thing of "possession is ownership" but became a thing of "record is ownership". In the process of its issuance and circulation, the central bank and commercial banks record financial information which make the management of financial activities are more convenient and efficient, and the user information recorded in the digital wallet account including opening and registration, the flow of funds, and the user's entire balance of estate are easier to control.

Because this process can record certain user information and transaction traces, therefore the user information and even personal privacy are at risk of being stolen, leaked or misused. There is an opinion that Internet payment methods improve the efficiency of payment and settlement. Yet, it directly violates the privacy of individual users, and the vast majority of such violations are carried out in the background which is extremely difficult for ordinary users to know, obtain

²⁶ *Id.* at 7.

²⁷ *Id.* at 8.

²⁸ David Wolman, *The End of Money: Counterfeiters, Preachers, Techies*, (Linmei Ma, World Book Inc, 2013) at 35.

²⁹ *Id.* at 5.

evidence, and make claims.³⁰ Changchu MU also pointed out that blockchain technology has shortcomings in terms of performance, security, storage, interaction, operation and maintenance, compliance, functions and other aspects. It is at the cost of storage and co-computing, system processing efficiency and partial privacy of customers are sacrificed, so it is not yet suitable for high concurrency scenarios such as traditional retail payments.³¹ However, at present, China's digital currency pilots are basically focused on retail, daily life and other small application scenarios. Everyone's consumption habits, whereabouts, and even all aspects of work and life are under the system's full-time monitoring. The ways to regulate the central bank's handling of customer data, the distribution of powers and responsibilities, as well as the protection of users' information from being leaked or abused, are still aspects that represent a void for legislation to fill in.

Someone believe that the “loss of regulatory control “is inextricably linked to an expanded concept of privacy in the context of CBDCs because they create data in ways that can be used to reduce freedoms for whole communities.³² As mentioned above, controllable anonymity is one of the PBOC's slogans for privacy in DC/EP, its official interpretation is guaranteeing the reasonable needs for people's anonymous transactions and their information protection. However, the opinion that the PBOC is promoting DC/EP to the Chinese public as a more privacy-preserving way to pay than China's currently dominant payment tools run by private firms still exists, even though government access to data will be unprecedented under the new system.³³ The Chinese have already largely given up privacy by giving up cash to adopt digital payment systems, and they may end up in the next stage transacting CBDC via Alipay or WeChat Pay wallets, giving their data to both the government and wallet providers from the private-sector: this would arguably imply the worst scenario for civil liberties.³⁴ These are doubts expressed by some authors in western countries and their suspicion or distrust to the protection of personal information in the applications of DC/EP. Due to limited technical capabilities, individuals might easily see their private data being used or even stole by others through the means of data crawlers or other ways, without even knowing it.³⁵

Under the current legal framework in China, personal information refers to all kinds of information of natural person that shall be protected, which encompasses various information of an identified or identifiable natural person recorded electronically or by other means, but it does not be included anonymized

³⁰ Yujie Zhang, Judicial Application, System Problems and Evidence Law Innovation of Blockchain Technology, “Oriental Law”, Rev.3, 2019.

³¹ Changchun Mu& Gang Di al., *The Development and Management of Blockchain*, Chinese Finance, Rev.4, 2020.

³² Ellie Rennie & Stacey Stelle, *Privacy and emergency payments in a pandemic: How to think about privacy and a central bank digital currency*, 3 12 (2021).

³³ Martin Chorzempa, *Promise and Peril of Digital Money in China*, Cato Journal 13.

³⁴ *Id.*

³⁵ Lu Jin, *Rules and technology: risk judgment and legal regulation of blockchain technology application*, “Law Science Magazine”, Rev.7, 2020.

information.³⁶ This is indeed in line with the *EU General Data Protection Regulation* (GDPR), which is globally very well-known and influential in the field of personal information protection. As regulated in the *Personal Information Protection Law of the PRC* (PIPL), the processing of personal identifiable information needs to comply with the principles of lawfulness, legitimacy, necessity, good faith, clear and reasonable purpose, minimum impact and scope, openness and transparency, and it is mandatory to disclose the processing rules, purposes, methods, and scope.³⁷ Nevertheless, the PIPL just entered into effect not for a very long time, so the local implementations should be conducted with adapted legal enforcement, local law and regulations or policies in detail. Moreover, some differences still exist between the information processing principles and the policies implemented in the DC/EP pilots, especially in some local commercial banks with collaborating on the promotion of e-CNY with the PBOC. In order to not only make their services more accurate, personalized and convenient, but also to improve service experience as well as service quality, and prevent risks, the bank will process statistics and analyze on the collected customer information, and provide them with corresponding services or products based on the above information.³⁸ Such clauses for the purpose of improving service quality, etc., there is no clear criteria on those purpose of collecting the information of each clients in this way. All of this will undoubtedly increase the risk of leakage, abuse of user's information.

3.2 The legal issues of DC/EP cross-border circulation

Currency circulation corresponds to the continuous movement of currency among different subjects as a means of circulation and payment. The cross-border circulation of sovereign digital currency is a country's sovereign digital currency that crosses the scope of circulation set by the country and exerts its value measure as well as payment method and other functions in other countries or regions. As a medium of exchange, the scope of currency circulation is determined by the scope of economy and trade. Comparing to traditional currencies, digital currencies indeed possess more advantages. In the contemporary society, we cannot avoid the economic exchanges with other countries, so the cross-border circulation of sovereign digital currency represents an inevitable trend. At present, the basic rules and supporting systems of legal digital currency are still in a new stage of exploration. Legal digital currency will face many legal issues such as currency sovereignty conflicts, potential criminal risks, and innovations in international regulations and coordination mechanisms in cross-border payments.

³⁶ Personal Information Protection Law of the People's Republic of China (promulgated by the Standing Committee of the National People's Congress, 20 August 2021, effective 1 November 2021), article 2, 4 and 73.

³⁷ *Id.*, article 5,6 and 7.

³⁸ For example, in the Postal Savings Bank E-CNY Wallet Personal Information Protection Policy, article 1.4.

3.2.1 Obstacles resulting from sovereignty conflicts

China has proposed the principles of “no detriment”, “compliance”, and “interconnectivity” for CBDC regulation, which involves CBDC’s cross-border use.³⁹ The mobility of CBDC concerns monetary autonomy of states. Sovereignty and compliance with domestic law are highlighted in the first two principles (i.e., no detriment, compliance)⁴⁰. Therefore, currency sovereignty represents the first issue that needs to be considered in the cross-border transactions of CBDC.

When a country's CBDC is applied to cross-border payments and foreign exchange transactions, its citizens and enterprises can easily bypass the domestic currency payment system as well as the foreign exchange management system through distributed payment networks or digital wallets to directly purchase and save other countries' CBDC, and it can be purchased in advance without the need to bear extra fees and unfavorable exchange rates, thereby breaking the inseparable pattern of traditional cross-border transactions and foreign exchange transactions, allowing the country's currency to be included in the competitive foreign exchange market.⁴¹ This will not only cause the existing foreign currency scales in the domestic market to become larger than the official foreign currency scale, which will affect the country's currency and foreign exchange management and cause an imbalance in the international balance of payments and reduce the use of domestic currency or even form currency substitution.

From the current situation, the countries that actively develop and launch CBDC and make them participate in the international circulation, normally witness their domestic economy developing well, and their national currency tend to have a good international reputation, too. The issuance of CBDC means that the structure of the international monetary system has undergone a certain degree of adjustment, which is conducive in promoting the diversification of international reserves and remittance.⁴² The cross-border payment of China DC/EP will greatly promote the process of RMB internationalization. At present, while China has not fully opened its capital account, the role of DC/EP in cross-border payment is still limited, which requires further reform of the domestic financial market and the gradual opening of capital controls. So far, China has maintained a negative attitude towards the legal status of non-legal digital currency, but with the increasing number of non-legal digital currency issuers and currency usage in other countries in the world, the large-scale use of currencies that are not denominated in sovereign currency may limit the

³⁹ Working Group on E-CNY and Development of the People’s Bank of China, (2021), http://www.pbc.gov.cn/en/3688110/368817_2/4157443/4293696/2021071614584691871.pdf (last visited May 1, 2022).

⁴⁰ Heng Wang, *China’s Approach to Central Bank Digital Currency*, SSRN JOURNAL (2022), <https://www.ssrn.com/abstract=4036466> (last visited Apr 20, 2022).

⁴¹ Raphael Auer & Rainer Boehme, *The technology of retail central bank digital currency* (2020), https://www.bis.org/publ/qtrpdf/r_qt2003j.htm (last visited April 25, 2022).

⁴² Kristalina Georgieva, IMF Managing Director Washington, & DC, *Leveraging Digital Money to Facilitate Remittances*, IMF, <https://www.imf.org/en/News/Articles/2021/04/14/sp041421-leveraging-digital-money-to-facilitate-remittances> (last visited May 2, 2022).

currency policies and erode national monetary sovereignty and national financial control capabilities. Therefore, when Chinese DC/EP is circulating internationally, whether it has extraterritorial legal effect or depends not only on the establishment of its legal status by domestic law, but also on the recognition of international law and regulation of its cross-border circulation, etc. If not, there will be a lack of legitimacy for CBDC cross-border circulation. From the perspective of international law, if China's DC/EP does not sign relevant currency circulation agreements with other countries or is not recognized by the domestic laws and regulations of relevant countries when making cross-border payments, and it will face legal obstacles and also hinder the process of internationalization of RMB.

3.2.2 Risk of a potential increase in cross-border crime

Due to the particularity of CBDC's technology, it can be transacted online or offline, so it seems very convenient and efficient. In addition to its anonymity, it can be easily used to engage in some crimes such as money laundering, tax evasion and terrorist financing activities.⁴³ Furthermore, it might also increase the difficulty of foreign exchange control in the state level.

The overseas circulation of sovereign digital currency makes it more convenient for people to carry digital currency in and out of the country for transactions, which may enable some criminals to take advantage of the convenience of cross-border transactions of digital currency after gaining illegal income: they may carry through a large number of money laundering transactions that might be prohibitive in the country. Or inject illegally obtained funds aboard into digital wallets in the form of digital currency through mobile terminal devices to evade supervision from the customs. Although digital currency can improve the transparency of economic activities, fully reflect the flows of funds, facilitate monitoring of the use of funds, ensure data security and achieve specific policy purposes, it can also reduce the risk of money laundering crimes to a certain extent. However, the digital RMB supports anonymous peer-to-peer transactions, which will generate many transaction entities outside China's financial supervision system.⁴⁴ Moreover, as more foreign financial institutions and transaction entities participate in transaction settlement, the regulatory capabilities of these financial institutions are uneven, which may make the supervision of related currency crimes harder.

4. The prospects of DC/EP

The PBOC has publicly stated that China's digital RMB is designed for retail, for the convenience of people and merchants, thus not to intended to replace the

⁴³ Contingency Planning for a Central Bank Digital Currency, <https://www.bankofcanada.ca/2020/02/contingency-planning-central-bank-digital-currency/> (last visited May 1, 2022).

⁴⁴ Xuemin Bu & Qijia Ma, *Cross-border flow of digital RMB: motivations, challenges and regulations' response*, "Law Research", Rev.1, 2022.

international status of the US dollar. While the Digital Currency Research Institute has cooperated with the Hong Kong Monetary Authority to conduct technical testing of digital RMB cross-border payments⁴⁵ and has already conducted the pilot scenarios in the Beijing 2022 Winter Olympics. Some international discussions consider that "China's digital currency is developing very fast, and it is a great weapon and asset in the future". In response to this statement, Xiaochuan ZHOU qualifies that the issuance of currency as the liability side of the balance sheet, and the central bank must ensure that the currency issued by itself possesses purchasing power through institutional guarantees, commitments, and back-up support. In fact, it is not easy to apply digital currency to geopolitics.⁴⁶

The world is going through great changes unseen in a century. The DCEP's distribution and promotion will inevitably confront the competition from the *Society for Worldwide Interbank Financial Telecommunication* (SWIFT). From China's point of view, the over-reliance on SWIFT represents a significant strategic security risk for a sovereign state. China has started the construction of the Cross-border Interbank Payment System (CIPS)⁴⁷ since 2012, and the issuance of DCEP has helped the development process of CIPS. In fact, some scholars like Agnieszka Janczuk-Gorywoda also suggest that virtual currencies have exposed the inefficiencies of cross-border retail payments, so they argue that virtual currencies are less well suited to cross-border payments than they appear to be.⁴⁸ Therefore, once the DCEP begins to be used and promoted in the cross-border payment through the digital currency system, it will have the advantages of high efficiency, low service charge, and low entering threshold for use. Moreover, its offline-payment function also supports transactions even without network environment. In this way, the RMB-centered international settlement system based on DCEP can be gradually built, which can be expected to accelerate the process of RMB internationalization. Although China's DCEP remains in the pilot stage for the moment, the related laws and regulations of CBDC should also enter into research and discussion. The issuance of DC/EP has a far-reaching strategic significance and is closely related to all users of RMB. Therefore, it needs to be regulated by higher-level laws (i.e. through the National People's Congress or the Standing Committee of the National

⁴⁵ Bank of Canada & Monetary Authority of Singapore, *Enabling Cross-Border High Value Transfer Using Distributed Ledger Technologies*, Jasper-Ubin Design Paper, 2018, at 6.

⁴⁶ Xiaochuan Zhou, *The goal of digital currency is the retail market, no intention to become a "weapon"*, Financial Times, (Apr.18,2022), https://www.financialnews.com.cn/gc/gz/202204/t20220418_244304.html

⁴⁷ CIPS, an independent payment system organized and developed by the PBOC, provides fund clearing and settlement services of RMB business for domestic and foreign financial institutions' cross-border and offshore. It is an important financial infrastructure in China and aims to further integrate the existing RMB cross-border business on the payment and settlement channels and resources, improve cross-border clearing efficiency, meet the developing needs of RMB business in major time zones, improve the transaction security as well as build a fair competition environment.

⁴⁸ Agnieszka Janczuk-Gorywoda, *Blockchain and Payment Systems: A Tale about Re-Intermediation*, in *Regulating Blockchain* 259–274 (2019), <https://oxford.universitypressscholarship.com/view/10.1093/oso/9780198842187.001.0001/oso-9780198842187-chapter-15> (last visited Apr 29, 2022).

People's Congress), since relying only on the central bank or commercial banks to issue regulations or protocol systems to promote the digitization of the RMB could make it difficult to support the national credibility required by DCEP in terms of effectiveness. According to Da KE's research on DC/EP's pilot problems in Shenzhen, the issuance and circulation mechanism of digital RMB mainly depends on the gradual exploration and experiments on the national scale, and from the current publicly disclosed information, this mechanism of digital RMB still maintains some important ambiguity.⁴⁹

Therefore, in addition to the necessity to adopt the Law on the PBOC as soon as possible to provide a formal legal basis for the issuance of digital RMB, there are also supporting laws and regulations shall be revised, including the Commercial Bank Law, Anti-Money Laundering Law and account authentication, non-bank payment institutions management as well as other laws and regulations. At present, some people think that the legislation and international standards must be preceded by the development of digital currency. On this point, Xiaochuan ZHOU see it as a good prospect, and in his view, it is difficult to establish, in a short term, a comprehensive legislation in the process of research, development, and innovation.⁵⁰ Hence, like the reform carried out by the Chinese government in some areas, it is possible to let some regions carry out pilot reforms before the full implementation of DC/EP, while it is important for the legislator to be able to guide legislative amendments based on those pilot practice. This may also constitute the trend of China's domestic legislation on digital currency for a period of time in the future.

With regard to some cryptocurrencies in other countries, given their unregulated and undefined nature, global currencies may fall within the competence of many different regulators of a country, leaving the room open for several agencies to capture the empty regulatory space and regulate global currency as money, commodity, or technology.⁵¹ It is inevitable that DCEP will compete with other types of digital currencies in the future when processing the cross-border payments, so it will encounter many obstacles and challenges during the future development. How to further participate in global financial governance through the issuance and promotion of DCEP represents an issue that cannot be ignored. Due to political manipulations and differences of interests among countries, the international monetary system still lacks a systematic and consistent coordination mechanism, in order to reduce the regulation of digital currency at the national level. For the sake of reducing the spillover effects resulted by the supervision of digital currency of the nation level, international policy cooperation is required to reduce welfare losses, to achieve Global Pareto improvement and then establish a worldwide set of CBDC's

⁴⁹ Da Ke, *The Ideal and Reality of digital RMB - Based on the Observation of Shenzhen's digital RMB pilot activities*, "Financial Law Forum", Rev.3, 2020, at 166.

⁵⁰ *Id.* at 13.

⁵¹ Georgios Dimitropoulos, *Global Currencies and Domestic Regulation: Embedding through Enabling?*, in *Regulating Blockchain* (2019), <https://oxford.universitypressscholarship.com/10.1093/oso/9780198842187.001.0001/oso-9780198842187-chapter-7> (last visited May 5, 2022).

regulatory standards, while a lot of political input from all countries to gradually build a consensus also represents a necessity.⁵² In the process of establishing global standards, a "top-down" approach can be taken, implement a framework of cooperation with those countries who has the leading CBDC technology, to establish specialized regulatory agencies and regulatory standards. By doing this, it is possible to form a set of regulatory mechanisms in this field. In fact, this could be gradually adopted by the central banks of various countries, and it can be transformed into the domestic laws for application while taking the actual situation of each country into account.

A complex and sophisticated digital currency system is inseparable from the combined application of law and technology. Behind the competition of technical capabilities lies the competition of the rule of law. Even after the preliminary establishment of the legal digital currency system, the traditional laws and regulations will still face huge challenges. For example, the protection of personal privacy which mentioned above is limited by the lack of clear legal provisions, it is easily exposed to various regulatory agencies along with the rapid developing technologies. In recent years, the governance of the digital society has gradually been impacted by codes and algorithms, thus any information of individual may be digitized. The view that *code is law* makes the rule of law appears to imply a hidden worry that it will be replaced by technology. In fact, in the conflicts of laws and codes, the law does not necessarily accept the content of technological codes, but it may override their substance, subject the substance of these rules to legal scrutiny.⁵³ Therefore, under an ideal legal framework, we need to lay emphasis on the fusion of law and technology, then realize the meaning of law which is through the setting and implementation of norms to solve the real subsistent problems.

5. Conclusion

China has recently announced the outline of its 14th Five-year Plan for National Economic and Social Development which is dedicated to stably promote the research and development of CBDC. The 14th Five-Year Development Plan for Financial Standardization jointly issued by the PBOC and other departments also expressed that it is necessary to study and formulate legal digital currency information security standards.⁵⁴ Under this context, it is significant to examine the design concept, current development and regulation of CBDC based in China, more precisely with a global perspective. This article provided a comprehensive review of

⁵² Xiaofen Tan & Xingshen Li, *Cross-border capital flow management and global financial governance*, "International Economic Review", Rev.5, 2019, at 72.

⁵³ Florian Möslein, *Conflicts of Laws and Codes: Defining the Boundaries of Digital Jurisdictions*, (2018), <https://papers.ssrn.com/abstract=3174823> (last visited May 5, 2022).

⁵⁴ Notice by the People's Bank of China, the State Administration for Market Regulation, the China Banking and Insurance Regulatory Commission, and the China Securities Regulatory Commission of Issuing the "14th Five-Year" Development Plan for Finance Standardization, <http://www.lawinfochina.com/display.aspx?id=37685&lib=law&SearchKeyword=&SearchCKeyword=> (last visited May 5, 2022).

the development of CBDC including its pilot situation and current legislation, then illustrated the potential legal challenges in China from the prospective of both domestic and international levels. Furthermore, this article tried to analyze the current DC/EP practice and regulatory issues in detail through legal theories and practice by concluding that there is still a long way to build a complete legal system to ensure the development of DC/EP. There is no doubt that DC/EP in China will imply a tremendous potential in the financial services sector, but it needs to overcome more challenges not only inside domestically and also to collaborate with other countries.

This article identified the main legal challenges of DC/EP encountered during the pilots, but still not a round analysis. It does not further examine the issue of cross-border payments and its potential competition with the other cryptocurrencies or the SWIFT. Since according to the PBOC in China, the DC/EP focuses on the domestic market at present, so we need to address the practical and regulatory issues revealed in the current DC/EP pilot, but the internationalization of RMB represents a trend that cannot be ignored. Thus, this article provided a basic analysis of DC/EP for more future research in the financial cooperation and on an international level.

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