

Research on the Development Opportunities and Paths of Digital RMB Internationalization Under the Background of Great Power Competition



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Abstract: At present, the global political economy is experiencing a crisis of great power competition. At the same time, the new industrial technology revolution accompanied by the process of digital economic globalization is quietly changing the way of human production, life and consumption. In this comprehensive context, digital currency, as the carrier of future monetary value, has ushered in a fast track of development. The digital RMB "e-CNY" of the People's Bank of China has stood on the stage of monetary history in the form of legal tender through national credit endorsement. As a digital financial currency with national credit endorsement, how can digital RMB further expand its influence and international currency stickiness? What are the competitive advantages, development opportunities and development paths of digital RMB internationalization? How does the internationalization of digital RMB affect the diversified innovation and development of the global financial system? This paper attempts to analyze and study many factors of the development of digital RMB internationalization under the background of great power competition, introduces the concepts of digital currency ecological index K_e , digital currency market density index K_d , digital currency market willingness index K_q and digital currency market competitiveness index K_c , and puts forward the calculation formula design of digital currency ecological index K_e . Secondly, according to the topic hypothesis, the core competitiveness model of digital RMB internationalization leading strategy is creatively proposed, and the development path model of digital RMB internationalization is summarized and summarized on the basis of the above discussion. Finally, this paper gives some reference opinions on the development path of digital RMB internationalization. This paper provides a research approach on the development path of digital RMB internationalization based on the dual role of great power competition and digital economy development, and provides some reference for the policy of digital RMB internationalization.

Keywords: e-CNY; Great Power Competition; Internationalization; Leading Strategic Advantage; Digital Currency Eco-index; Metaverse +

DOI: 10.57237/j.wjeb.2023.02.001

1 Introduction

Since the outbreak of the international financial crisis in 2008, the world economic growth has experienced ups and downs, and "black swan" and "gray rhino" events have emerged one after another. On the other hand, the

zero-sum game between major countries, starting with the China-US trade dispute, the Federal Reserve's interest rate hike and the Russia-Ukraine conflict, is having a profound impact on the world political and economic. This impact

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is reflected in the financial and monetary field as the international currency exchange rate frequently exceeds expected fluctuations.

Dragged down by the epidemic and exchange rate factors, China's GDP growth in the first three quarters of the year was only 3.0%, far lower than the development level of the same period, and the GDP gap between China and the US is widening, which casts a shadow on the China-led RMB internationalization process. In addition, the pandemic and the Great recession will further affect the pace of global economic recovery in the future, and the global economic recovery will go through repeated twists and turns. Chen Qilai and Feng Yingjiao (2022) believed that in January 2022, the International Monetary Fund lowered the forecast of global economic growth in 2022 by 0.5 percentage points again, indicating that the global economy had entered the bottleneck period of recovery [1]. How should China continue to deepen RMB exchange rate reform in the face of weak global economic recovery fundamentals and growing geopolitical tensions? One of the main research contents of this paper is to use the leading strategic advantage of digital RMB to establish a strong currency foundation, seek development opportunities under the background of great power competition, explore and practice new breakthrough ways for the same currency subject, and further expand the international financial influence of RMB and the international strong currency stickiness through great power competition.

Central banks of different countries have certain differences in their attitudes towards issuing digital currencies. According to the results of a questionnaire on central bank digital currencies (CBDC) released by the Bank for International Settlements (BIS) in early 2021, 56 of the 65 central banks that participated in the questionnaire survey have started CBDC research and development, accounting for 86% of the total. Most of the central banks that have not carried out relevant work are small economies. Specifically, about 60 percent of national central banks are conducting trials or proof-of-concept, and 14 percent are in the pilot phase. The progress on CBDCS by central banks can be divided into four categories. The first is that CBDCS have been launched; The second category is those that have conducted R&D trials or have launched CBDC pilots; The third category is studying the feasibility of launching CBDCS; The fourth group believes that there is no need to issue CBDC in the short term, or has not taken a

position yet. Different from most national central banks' policies on digital currency, the People's Bank of China is actively promoting the legalization of digital RMB and the national application pilot process, believing that digital RMB is conducive to the rapid development of China's digital economy and will play a decisive role in promoting the construction of cross-border payment financial system of RMB. Sun Zhao (2022) believed that the decision of the IMF Board of Directors to increase the weight of RMB from 10.92% to 12.28% on the basis of maintaining the composition of the existing SDR basket currencies in May 2022 indicates that RMB has the conditions to become a safe haven currency, which is another sign of progress in the internationalization of RMB [2]. Under this background, it has become one of the main research contents of this paper to discuss how to realize the internationalization development path of digital RMB.

To sum up, the diversified development of the international monetary and financial system will become a major global concern and future trend. This paper will conduct corresponding research on the development opportunities and paths of the internationalization of digital RMB by the People's Bank of China under the current situation of increasingly fierce competition between great powers, seek to establish an international strong currency system, further explore the possible paths of the internationalization of digital RMB by national credit endorsement, and provide exploration experience for the same currency subject to provide a strong currency system.

2 Research Background and Significance

2.1 Analysis of Geopolitical and Economic Forms

Economic competition often means reducing and preventing economic contact, the "backside" of economic cooperation. We believe that strategic competition is not "competition" in the general sense, but "a competitive relationship in which independent countries regard each other as rivals and clear threats" [3]. "economic rivalry" serves strategic competition, aiming to obtain, maintain and expand relative economic advantages; Compared with other strategic competition strategies, economic competition is carried out by economic means or

diplomacy supported by economic power.

First, the trade dispute between China and the United States, which began under the Trump administration, has continued to this day and will continue to do so. Although the US presidential election in 2020 changed the US regime, it did not help reduce the intensity of economic competition between China and the US, and it is likely to be a protracted war. Biden's international economic policy of "serving the American middle class" not only did not relax the tariffs and economic sanctions against China imposed during the Trump period, but also established an economic competition decision-making mechanism of "breaking through the internal and foreign estranges" [4]. The trade dispute between China and the United States is due to geopolitical and economic factors of the United States, which hopes to recover its economic advantage and curb China's strong economic momentum. With the increasing political and economic advantages accumulated by China's reform and opening up, it is an inevitable trend for Sino-US trade relations to gradually transition from the initial trade complementary relationship to the trade competition relationship. It is a problem that the world's political economies, including China and the United States, should face up to. The author believes that the only way to solve the current political and economic competition between great powers is through reasonable and orderly competition. Development is the key, which is both an opportunity and a challenge for the global economy, including China and the United States.

This trend can be clearly seen from the relevant economic data of China and the United States from 2008 to 2018: China's share of world GDP gradually increased from 7.2% to about 16.1%, while the share of the United States' GDP increased from 23.1% to 23.8% during the same period. Other large countries all declined, including Japan from 7.9% to 7.7% and Germany from 5.9% to 4.6% [5]. In addition to GDP, the share of global manufacturing value added in both China and the United States has also expanded significantly. In the United States, it increased from 24.98 percent in 2000 to 30.91 percent in 2015, while in China, it increased from 6.5 percent to 26.74 percent. All countries except China and the United States saw sharp declines of varying degrees, with Japan and the 15-nation European Union both falling by about 10 percent. In terms of the number of large technology companies, eight of the 15 companies valued at more than \$10 billion in 2018 were in the United States and six were in China, which is in a "duopoly" situation. From the perspective of power distribution, there was an obvious

trend of polarization during this period: the United States maintained and slightly improved its overall economic status, while China's overall economic status increased rapidly, while other countries generally declined [6]. Of course, with the outbreak of COVID-19 in the world from 2020 to the end of 2022, global economies have suffered setbacks and crises to varying degrees. The rapid contraction of the Chinese market and the recent US bank failure crisis are the continuation of the epidemic crisis and the zero-sum game between major countries. Similarly, global politics, economy and politics seek new development opportunities, and the crisis under the background of great power game is also the starting point for the integration and innovation of different civilization subjects, which history will prove.

Secondly, the Russia-Ukraine conflict that began on February 24 this year has intensified new changes in the world pattern. Europe and the United States have used the stick of financial sanctions of the World Bank to restrict Russia from being excluded from the SWIFT system and impose dual sanctions on Russia's economy and politics. The continued escalation of the Russia-Ukraine conflict will have a long-term impact on the world's energy, food and other sectors, further exacerbate the damage to the global supply chain and value chain system affected by the epidemic, and bring new changes to the global political and economic landscape, especially the financial sector. In view of the above new international political and economic situation, Liu Zhibiao believes that "China must carry out a new globalization rather than abandon globalization." "In the past, globalization was not initiated by Chinese enterprises, and China was the world factory, not the world market," he said. Liu Zbiao also pointed out, "In the past, the economic cycle was dominated by external circulation and supplemented by internal circulation, which was the 'away globalization' in developed countries, and Chinese enterprises were passively embedded in the global value chain. This paper notes that China is seeking a new breakthrough growth point for global political and economic development, or is seeking a new political and economic growth pole. If the existing international political and economic environment cannot meet the needs of human political and economic development, revolution may be the only choice. Whether for the beneficiaries or supporters of the old world political and economic system, or for the emerging political economies, it will be an internal revolution, and only through self-transformation can we achieve faster development. At the same time, we

will promote win-win cooperation and achieve financial inclusion to bring winning opportunities to the new external challenges that mankind will face.

Finally, the RCEP trade agreement, which came into effect at the beginning of 2022, offers a new path for integrated development and innovation for Asia's economic recovery against the backdrop of the pandemic, the Great Recession, and intensifying competition among major powers. The full entry into force and implementation of the agreement will help Asian economies recover from the shadow of the Great Recession ahead of schedule and help the process of new globalization. Based on the perfect integration of the inclusive characteristics of Eastern culture and the radical innovation role of Western civilization, this paper argues that with the rise of a new round of industrial and technological revolution in the development of digital economy, Asia, especially East Asia, will become an important third pole of global political economy, and its role will become more and more obvious. In addition, a series of events such as China-US trade frictions, the COVID-19 epidemic and the Russia-Ukraine conflict have led to changes in the basis of the division of labor in the global industrial chain. Multinational enterprises' strategic investment in globalization shrinks, the government's resource investment in maintaining globalization gradually decreases, and the value chain system becomes more localized. All this means that the global value chains of the past will change dramatically. Based on the above facts, China is striving to build a "new local globalization" and strive to become the innovation center, market center and production center of the world's economic solutions.

To sum up, the author believes that the signing and entry into force of RCEP will help promote the integration and innovative development of Eastern and Western civilizations, and that the current global geopolitical and economic pattern is conducive to the formation of a new global pattern of economies dominated by Eastern civilizations. In addition, great power competition is bound to promote the construction of a new Asian value chain system, and globalization with China's participation is the only way to achieve win-win cooperation. Meanwhile, the internationalization of RMB and digital RMB will make the world financial system more perfect and secure.

2.2 Research on Application Scenarios of Digital RMB

With the development of a new round of industrial and

technological revolution, the digital economy is bound to reshape the global value chain and supply chain. The increasing proportion of China's economy in the global value chain system promotes the globalization of digital RMB application.

In view of the current scale and trend of global digital economy development, Dae-Won OH, Eun-Hye Lee, and Manjiang Xing (2021) believe that digital currency is becoming the focus of global financial reform [7]. Most professionals now believe that digital currencies in a broad sense include both fiat currencies issued by central banks and private digital currencies such as Bitcoin, which have high international recognition. The digital currency recognized in a narrow sense refers to the legal digital currency uniformly issued or authorized for use by the central bank of the country in accordance with the legal norms of the country. This digital currency has legal effect, is endorsed by the state and has the same utility as the legal currency of the country based on the economic value of the country or the central bank bonds issued by the central bank. At present, the central bank's digital currency issuance mode is mainly divided into wholesale and retail issuance modes. Wholesale refers to the digital currency of financial system settlement tools issued by the central bank to commercial banks and other financial institutions. Retail refers to the digital currency issued by the central bank to enterprises and individuals for daily economic activities [7].

According to the 2022 Digital Ecology Index report released by Peking University, the global digital ecology shows a leading pattern of the United States and the United Kingdom, while China's development ranks the first echelon. China's development model belongs to the application-led type, the United Kingdom and the United States belong to the comprehensive development type, and European countries belong to the multi-driven type. From the ecological perspective, it can be found that the application and development of digital RMB will greatly accelerate the construction of value elements of digital economy, and describe the process of reconstructing a regional, national and global value chain of digital economy in a more comprehensive and rich way.

Digital RMB "e-CNY" is a digital legal tender issued by the People's Bank of China, which is operated by designated operating institutions. Based on the generalized account system, it supports the loose coupling function of bank accounts, is equivalent to physical RMB, and has value characteristics and legal compensation [8]. Wang Jia-jia and Shen Kun-rong (2021) believed that digital RMB is a retail

central bank digital currency, mainly positioned as cash payment voucher (M0), adopting a two-layer operation mode, and having the advantages of strong portability and easy forgery of electronic payment tools and payment and settlement and anonymity of physical RMB [9]. Li Lihui believes that the "digital RMB" has five characteristics: first, it adopts centralized management and dual-level operation mode to ensure the reliability of monetary policy transmission mechanism and the efficiency of monetary regulation. Second, it has both account and value characteristics, compatible with account-based, quasi-account-based, value-based and other three ways. Third, the method of "loose coupling of accounts" and digital wallet can realize payment and settlement, and realize "controllable anonymous payment" according to the principle of "anonymous for small amounts and traceable for large amounts in accordance with the law". Fourth, centralized and distributed hybrid technology architecture should be applied, trusted computing and dedicated encryption integrated with hardware and software should be applied, and a multi-level security system should be adopted. Fifth, loadable smart contracts achieve programmability, perform conditional automatic payment, and support business model innovation [10].

Based on the above discussion, the application scenarios of digital RMB should cover three parts: capital source acquisition system, intermediate consumption application system and terminal settlement system. The specific application scenarios are gradually expanded to include residents' daily consumption, wages, provident fund, individual tax, corporate settlement and transnational payment system. Application entities gradually cover banks, schools, enterprises, public transportation services, government service systems and other traditional currency using entities. In addition, the digital RMB terminal service system combined with application software (APP, etc.) and cloud computing power support service system provides the possibility for digital RMB to enrich application scenarios. Since 2021, the pilot process of digital RMB has been accelerated, with great strides made in pilot areas, use functions and application scenarios. According to information disclosed by the central bank, by the end of 2021, there had been more than 8,008,100 pilot digital RMB scenarios, 261 million personal wallets had been opened, and the transaction amount was 87.565 billion yuan. With the successful holding of the Beijing Winter Olympics and the first show of digital RMB, digital RMB will usher in the spring of development in China. Su Xiaarui believes that with the continuous deepening of the

pilot of digital RMB, the digital RMB will be deeply applied in the whole industrial chain of the national economy in the future, not only simple payment, transfer and other functions, will be fully combined with intelligent hardware, artificial intelligence technology, so that the digital RMB can play a greater role in the digitalization of the industrial chain, improve the audience's acceptance ability and practical application ability. We will give full play to the role of money. Sun Yang believes that digital RMB will also make steady construction and improvement in user experience, security and privacy protection, data security and other basic aspects, laying a solid foundation for the development of digital RMB [11].

To sum up, digital RMB may usher in a golden period of development with the process of digital economy globalization under the background of great power competition. Open, transparent and fair political and economic development policies will help improve the general acceptance and application ability of digital RMB audiences and expand the international influence of digital RMB. This paper will mainly analyze the factors affecting the development of digital RMB internationalization under the background of great power competition, extract the development path of digital RMB internationalization, and provide reference for the corresponding research of digital RMB.

3 Research Hypothesis

In recent years, with the expansion of the pilot scope of the digital RMB "e-CNY", more and more Chinese people have experienced the convenient services brought by the digital RMB. Yao Qian, Director of the Science and Technology Supervision Bureau of the CSRC, said at the 2021 Spring meeting of the International Finance Forum (IFF): The birth of digital yuan In the context of the digitalization wave, it is necessary for the central bank to actively innovate the issuance and circulation methods of legal tender, explore the central bank of digital tender, optimize the payment function of legal tender, alleviate the impact of private electronic payment tools, and improve the status of legal tender and the effectiveness of monetary policy [7].

Compared with traditional monetary assets, digital currencies constitute another form of liquidity with significant differences in ownership, transactions, and production matters (Bohme et al., 2015). There is a fierce debate about whether digital money can fulfill the functions of money and thus serve as a means of transaction, store of

value and unit of account (Yermack, 2015; Ammous, 2018). Digital currency will be different from the gold standard or US dollar based pricing system in the traditional form of currency, but when the digital currency endorsed by national economies or a considerable number of economic entities endorsed the value of digital currency, it will represent a different energy form, and digital currency will perform the functions of basic currency to a certain extent in terms of its means of transaction, value storage and account book value. Therefore, national endorsement of digital currency will be the only way to represent its functional value at this stage. That is, the development of digital currency will return to the status of legal tender endorsed by the state in the future. This definition will be the only consideration to determine the acquisition and identification of digital currency, and is the theoretical basis of the value of digital currency. The value basis of digital RMB is the value regulation supported by state behavior to ensure the status of legal currency, the credit value supported by the credit value endorsed by the state, and the choice of future application scenarios provided by its own digital data interaction ability.

Digital RMB is the inevitable result of national monetary sovereignty and market economy choice, and is the development path of optimizing service capacity. Digital RMB has the ability to optimize the allocation of financial resources, effectively reduce the production and circulation costs of traditional currencies, help the construction of inclusive financial service system, and improve the flexibility of monetary policy. Li Shuaishuai and Ren Tong (2021) believed that the legal digital currency to be issued by China's central bank is digital RMB (DC/EP), which adopts the method of "account loose coupling + dual offline payment," which not only improves the security of

payment, but also makes the use more flexible and convenient. Even in the case of no mobile network signal, transfer or payment can still be completed [12].

At present, there are three main operation modes of the central bank digital RMB: one is "single-layer delivery mode", the other is "dual-layer delivery mode", and the third possible mode is "dual-layer delivery + third-party mode". The operation mode of the People's Bank of China's digital currency initially adopted the "two-tier mode" of "central bank, commercial banks and consumers." With the rapid development of China's third-party payment platforms, a large number of third-party payment enterprises with deep influence have emerged, such as Alipay, Tencent Fintech, UnionPay Commerce, Kuaiqian, Tonglian Pay, and OneWallet. Although wechat Pay, Alipay and other third-party payment wallets and central bank digital RMB both carry out electronic development with the help of blockchain and big data technology, and have the advantages of high convenience and low cost, there are essential differences between the two: wechat Pay and Alipay are "wallets", based on account logic, and third-party escrow services; The digital RMB is the "money" in the "wallet", based on the logic of tokens, and a form of currency endorsed by the state, with higher security. Table 1 illustrates the differences between third-party wallet accounts and DC/EP digital RMB. In addition, with the launch of the digital RMB APP by the People's Bank of China and the continuous promotion of relevant pilot cities and banks, according to Ifeng Finance column, the digital RMB wallet function will be added to support the function of "online commercial bank (Alipay)" from May 8, 2021, indicating that the operation mode of the digital RMB of the People's Bank of China is more flexible. The promotion and application of the third possible operation mode can be explored.

Table 1 Differences between third-party wallet accounts and DC/EP digital RMB.

Item	Third-party wallet account (such as WeChat, Alipay, etc.)	DC / EP Digital RMB (e-CNY)
Positioning level	A payment instrument of legal tender	Legal tender digital currency
Money supply level	M1, Set up based on bank deposit account	M0, equivalent to notes and coins
Privacy protection	Real-name authentication, account and identity associated	Controllable anonymity to better achieve privacy protection
Credit rating	Enterprise credit, 100% provision guarantee	State credit guarantees payment, higher security
Clearing and settlement mode	Settlement through UnionPay/Netpay is required	Independent of the clearing and settlement intermediary system, payment is settlement
Convenience	superior	superior
Offline payment	Only single offline payment is supported	Supports dual offline payment, regardless of network and payment scenario restrictions
Coupling of accounts	Bound to the account, the account is tightly coupled	Accounts are loosely coupled, the acquisition threshold is low, and the universality is strong
Cash withdrawal fees	0.1% handling fee	nothing

From the above analysis, it can be seen that the technical capability of the central bank's digital RMB is

easier to meet the public's requirements for small anonymous payment services, and is more conducive to the functional integration and innovation of personal information security protection and effective risk supervision and control. The design structure characteristics of digital RMB application capability and technical capability are conducive to realizing multi-angle and multi-media communication function. For example, "small amount of anonymity and large amount of traceability" is the anonymous design feature of digital RMB, which can realize the loose coupling of digital RMB with bank accounts -- technically realizing the function of small amount of anonymity. In addition, its push sub-wallet design also enables the payment information to be encrypted -- protecting personal privacy. On the basis of anonymous design technology, e-CNY also maintains the ability to crack down on criminal behaviors: on the one hand, anonymity is limited anonymity on the premise of controllable risks, and complete anonymity is not feasible; On the other hand, the anonymity of central bank digital currency has regulatory functions such as anti-money laundering, anti-terrorist financing and anti-tax evasion. The most important point is that the central bank attaches importance to the realization of financial inclusion at the beginning of the design of digital RMB, and fully considers the future integration and innovation ability. This design is also conducive to reducing the threshold of financial services, reasonably optimizing the service rate, and more fully meeting the differentiated needs of different subjects, different levels and forms. Effectively avoid the "Digital Divide".

The regulation of e-CNY value is reflected in various legal norms and technical specifications issued in different periods as well as cooperation literature between different financial entities. In this regard, the People's Bank of China earlier released a draft amendment to the Law of the People's Bank of China, which intends to stipulate that legal tender includes physical form and digital form, giving legal tender physical form and legal tender digital form the same legal status, providing a legal basis for its issuance. At the same time, it also makes it clear that any private institution shall not issue private digital currency (virtual currency), which provides a legal guarantee for standardizing the circulation order of digital RMB. In addition, on March 23, 2021, the People's Bank of China (PBOC) announced that SWIFT and four Chinese institutions jointly established Financial Gateway

Information Service Co., Ltd. to provide financial gateway services to users. Pan Helin (2021) said that "The People's Bank of China has started the research on China's legal digital currency (DC/EP) since 2014. In 2019, the rulemaking and technology testing of China's legal digital currency have entered the final stage. At present, residents in many places have tried the use of digital currency, and digital currency has gained certain popularity and use scale from the pilot [13].

To sum up, the legalization of digital RMB with national credit endorsement is conducive to the diversified development of application scenarios. Therefore, on the basis of the above, this paper draws the following theoretical hypotheses.

Hypothesis 1 (H1) The value basis of e-CNY is endorsed by the national credit, including the value regulation of currency, credit value and digital capability.

Hypothesis 2 (H2) The application capability, technical capability and integrated innovation capability of digital RMB will help accelerate the expansion trend of diversified application scenarios of fixed exchange media, thus accelerating the internationalization of digital RMB.

The legalization of national credit endorsement of digital RMB provides a value credit basis for the internationalization of digital people's application. At present, the international environment is unpredictable, the reform of the international financial system is far from the expected results, the world economy dragged down by the COVID-19 pandemic has just seen the dawn, and the great power competition started by the China-US trade dispute is still continuing, which has also brought new unknown changes to the development of the world political and economic system. In the face of such a complex domestic and international environment, It will be difficult for the digital RMB to walk into the future and the historical stage of world finance by adhering to the development achievements of the new industrial and technological revolution.

In his article "A Comparative Analysis of the Japan-US Trade Imbalance and the Sino-US Trade Imbalance" published in the Japan Journal in 2020, Zhou Jinkai proposed that the Sino-US trade imbalance is another focus of the US in the economic and trade field after the Japan-US trade imbalance. The US linked the Sino-US trade imbalance with "industrial shock" and launched a trade war. Such measures are an excuse for the inherent ideological bias of the US and the containment of China's development. From the perspective of the continuity of

China policies from the Trump administration to the Biden administration, as well as the consistency of the US government's suppression policies on the second largest economic entity in history, the Sino-US trade frictions will show a trend of long-term, intensified and escalated and eventually return to orderly competition. The US Senate deliberated and passed the American Innovation and Competition Act 2021 in 2021, marking that the US has intensified its friction with China at the legislative level. From many perspectives, it can be seen that the Biden administration will reshape international institutions with the US as the core, and comprehensively containing and even cracking down on the so-called "most serious competitor" from China will become the theme of the US political economy in the future.

From the perspective of economic and trade structure and global economic security, Shen Guobing (2021) believed that as the two countries with the largest global economy, the development of trade relations between China and the United States under the epidemic is crucial to the stability of the multilateral trading system [14]. At present and for a long time to come, China and the United States are highly complementary in economic structure and trade structure, and there is great potential for cooperation. However, at some more detailed levels, there is also a certain degree of competition. Yang Yaoyuan and Li Yinuo (2021) believed that in the global trade system, due to the different advantages of both sides, there has always been a trade game between China and the United States. Moreover, in this game, China must further promote the transformation and upgrading of industrial structure, improve China's status in the global trade system, and improve China's discourse power in the global trade system [18]. Xiao He and Pan Rong (2021) believed that with the intensification of the economic game between China and the United States, the economic competition between great powers has become the most prominent phenomenon in international relations. Although economic competition between great powers cannot be avoided, the overall pattern and each other's strategies can still be shaped [6].

With the further escalation of the Russia-Ukraine conflict and the uncertainty of future global pattern changes, the intensification of sanctions against Russia by Europe and the United States, and the continuation and expansion of the crisis in the Middle East, it is necessary to promote the construction of a new financial trade settlement system based on the rational needs of

multi-party interests -- the mode of coexistence of multiple financial systems, so as to promote the development of the multi-pattern pattern of the world. On the other hand, under the Sino-US trade dispute, China must strive to promote the multilateralism trade process and seek regional or multilateral reciprocal trade mechanism. In addition, other emerging economies remain committed to pursuing a multilateral reciprocal trading mechanism; After the European Union experienced dollar deprivation, it is bound to usher in the euro zone rebound containment; At the same time, the leading currencies in Asia will also usher in new changes and seek to become an important pole of the diversified financial system. For example, the Japanese yen region is expected to continue its globalization process, and the Korean won region and other currencies can also gain equal development to become an important pole of the diversified financial system.

Based on the above factors, the author believes that the current great power competition will comprehensively promote the world's major economies to jointly seek to reduce the restriction and exploitation of the US dollar payment system on their own economic development, and finally form a new diversified financial system pattern of a wide range of power pole. In order to meet the multilateral trade mechanism and the process of RMB internationalization, build global economic integration and realize the dream of common prosperity, China has proposed and promoted the "Belt and Road" economic community and other political and economic community strategies to increase the frequency of economic and trade exchanges among countries along the Belt and Road, enhance the stickiness of RMB demand, and strive to promote the continuous expansion of the scope of influence of financial inclusion. Finally, the economy, finance and trade system will be free and anti-monopoly. The sustainable development of China's national economy and the strategic pattern of great power competition are conducive to the realization of global economic integration, providing breakthrough space and time for the breakthrough innovation and development of emerging digital financial system in the future, thus helping the development of a new round of fintech revolution to realize global inclusive finance.

Hypothesis 3 (H3) The competition pattern of great powers is conducive to the internationalization of digital RMB, helps to break through the existing financial system to realize the integrated and innovative development of

digital finance, and accelerates the formation of diversified financial system pattern.

The competition among major powers contributes to the internationalization of digital RMB with national credit endorsement. Digital currency is poised to become the future direction of currency development, bringing novel application experiences for humanity and gradually replacing traditional forms of currency. Such a form of digital currency already exists in our living environment.

As early as 1982, American scholar David Chaum predicted the future form of transaction money, arguing that paper money would eventually be replaced by digital money with the development of science and technology. The emergence of digital currency, especially Bitcoin, further confirms this prediction. The emergence of a variety of digital currencies in the global money market and the establishment and improvement of the circulation mechanism of the transaction framework prove that human society has entered the era of comprehensive digitalization.

The global spread of COVID-19 has stimulated the comprehensive digitalization of electronic consumer payment systems. Yi Gang (2021) pointed out that in recent years, especially after the outbreak of COVID-19, global electronic payment, especially mobile payment, has developed rapidly. Last year, the amount of mobile payment in China increased by nearly 25 percent year-on-year, and the current penetration rate has reached 86 percent, which not only facilitates residents' lives, but also strongly supports the fight against COVID-19. Central bank digital currency (CBDC) enables the central bank to continue to provide the public with credible and secure means of payment in the era of digital economy, and maintain the stability of the payment system while improving payment efficiency [15]. "Metaverse" represents a virtual world parallel to and highly interconnected with the real world, including augmented reality (AR), virtual reality (VR), cloud computing, AI, 5G, blockchain and other technologies, in which people can use digital avatars to communicate [16].

The Metaverse is a virtual world mapped and interacted with the real world by means of science and technology, and a digital living space with a new social system. The metaverse has its dual definitions of "virtual native" and "virtual and real symbiosis". It believes that human beings need a "metaverse +" symbiosis mode beyond light years in the future. "Metaverse +" helps to promote the discovery of digital economic value, which cannot be

separated from the development of digital currency technology. Metaverse design covers a variety of modern science and technology applications, and may also contain elements of future scientific and technological revolution. It is the result of the integration of multi-element scientific and technological revolution, and represents the development direction of human civilization to a certain extent.

Based on the development status of "metaverse +", different countries and enterprises have carried out application research and scene expansion tests on metaverse related technologies respectively. Bank of America announced that it will carry out VR training for employees in the group's 4,300 financial service centers. Employees in the financial centers will learn to use VR headsets to develop professional skills, including deepening communication with customers, negotiating with customers to solve problems, and answering customers' questions. Prashant Bhayani, chief investment adviser for Asia at BNP Paribas, believes that key elements of the "metauniverse" include virtual identities, social networks, immersive experiences and diverse content (such as entertainment, games, lifestyle, education, financial services, etc.) that customers can easily access anytime and anywhere. And the platform should have a well-functioning virtual civilization ecology. In June 2021, Kooknational Bank created a virtual town on its "metaverse" platform Gather that included a financial business center, a telecom-working center and a gaming arena. In the virtual town, customers can consult various businesses under the bank with digital identity, while enterprises can complete recruitment, online office and participate in online entertainment activities together through the platform [16]. In addition, there are many experiments on the development model of digital currency, such as the European Union's plan to develop digital euro in October 2020, the cross-border and cross-currency payment experiment conducted by Canada, the Monetary Authority of Singapore and the Bank of England at the same time, and the legal digital currency digital peso launched by Uruguay in November 2017.

Lu Feng (2021) believes that the metaverse is a digital virtual space created by integrating mobile Internet, cloud computing, big data, Internet of Things, artificial intelligence, blockchain, virtual reality and other technologies in accordance with the operation rules of the physical world. With the new consumption concept of the metaverse as the starting point, through packaging,

integrating and improving existing software and hardware products and technologies, promoting comprehensive integration and integrated applications, and creating new product supply and service experience for new scene applications, it will leverage the new round of development of information technology industry and comprehensively stimulate the enthusiasm and vitality of technology product innovation of software and hardware service manufacturers [17]. Metaverse technology will take the lead in bringing new changes to service models in social entertainment, cultural tourism, education and medical care, business and trade services and other fields, giving online services a more realistic experience and making online services more immersive. At the same time, the application of technology will also give rise to new business models and promote the prosperity of industrial ecology [17]. Industry analysts have pointed out that payments in the "metaverse" will include fiat currency and digital currency. Based on the current international regulatory policies on bitcoin and other digital currencies, there will still be a contradiction between centralized currency and decentralized currency in the "metaverse". The development of the metaverse relative to the digital economy and the integration and innovation process of digital currency need to be constantly explored to improve the regulations and technologies related to virtual application scenarios.

The concept of metaverse virtual world creates a new future application scenario for mobile digital payment system, and lays a technical foreshadow for human beings to move towards a new cosmic era in the future. The realization of the value of the virtual world of the metaverse can deepen the development degree of the digital economy; on the contrary, the integration of the digital currency value of the digital economic value will accelerate the realization of the digital concept of the metaverse. The innovative development of the integration of the two will help bring new gratifying changes to the world political and economic pattern -- the multi-dimensional development of the global value chain and the industrial chain. Therefore, this paper proposes the following hypothetical theoretical provisions.

Hypothesis 4a (H4a) The integration and innovation of the "metaverse +" virtual world concept and the digital financial system solve the problem of multi-temporal and spatial dimensions in the development of the new global value chain and industrial chain.

Hypothesis 4b (H4b) The integration and innovation of

"metaverse +" and digital currency will accelerate the globalization process of digital RMB.

Hypothesis 4c (H4c) the innovative development of digital RMB is conducive to the digital ecological integration and innovative development of traditional economy.

The integration and innovation of "metaverse +" and digital financial system provides a historical stage for the digitalization of traditional economy, which is reflected in the role of boosting the development of digital economy. In addition, the digital RMB with fiat currency has a leading strategic advantage for the existing financial system, which not only provides pioneering experience for digital finance, but also is the required path to solve the digital upgrading of China's industrial structure.

As the new round of scientific and technological revolution and the upgrading of industrial structure accelerate, digital RMB, as a new engine to smooth the domestic and international double circulation channel and promote high-quality economic development, is the internal requirement and strong support for China to release the vitality of digital economy and help the construction of digital China. Rational analysis of the strategic role of digital RMB in building a new development pattern can provide strong theoretical support for steadily promoting the development of digital RMB.

In an interview with China Financial News, Zhang Xiaomei said that the digital RMB that can first reconstruct an open and healthy digital ecosystem. Second, it can boost the steady and healthy operation of the digital economy; Third, seize the global digital economy competition track to help.

The size of the application market of digital currency, the depth of application scenarios and the acceptance ability of the audience determine the strength of the application ability of digital currency and the proportion of the global financial money market in the future. Shen Guobing (2021) believed that the global spread of COVID-19 had a significant adverse impact on the production activities of various countries and the global trade network, and triggered the remodeling of the global industrial chain and supply chain. The spread of the epidemic has enhanced the relative position of "Made in China" in the global industrial chain, making the US more dependent on China for trade under the epidemic. China and the United States have shown a high degree of interdependence in goods trade under the epidemic. In 2020, the volume of bilateral goods trade between China

and the US reached US \$586.72 billion, accounting for 12.6% of China's total foreign trade and 15.3% of the total foreign trade of the US [14]. Bacchetta and Wincoop (2005) argued that the high export share and product diversification make it possible for a country to price in its own currency in the international trade of this industry. Chen (2019) conducted an empirical study on the influencing factors of RMB internationalization by constructing a GMM model.

For a long time, the US dollar has occupied an absolute dominant position in the global monetary system, and the US has controlled the main channels for international payment settlement, especially the New York clearing house Interbank Payment System (CHIPS) and SWIFT international settlement system. As the world's dominant dollar payment system, CHIPS handles more than 95% of interbank dollar payment clearing. China is the world's second-largest economy, but the renminbi accounted for just 2.70 per cent of international payments in December, according to survey data from SWIFT. Obviously, the proportion of RMB as international payment and settlement currency does not match with the economic volume of our country. On the other hand, according to data from China's Patent Office, 31 existing digital RMB patents have been approved and made public, totaling 1,485 patented technologies related to digital currency. From the analysis of the quantity and scope of digital currency patent rights obtained, the patent quality of digital RMB is conducive to the internationalization of digital RMB, enhance the status of China's sovereign currency in the international financial system, and help China obtain the first-mover advantage in the global digital finance track. Zhang sees the rapid rise of the digital economy as an opportunity to break the hegemony of the US dollar in the global monetary system. Digital currency is the most important financial infrastructure in the era of digital economy, and the legalization of digital RMB helps to further integrate the data value information mastered by different subjects, break the existing data monopoly pattern, realize the integrated development advantage of the depth of field level of the whole scene, and promote the healthy development of digital economy.

The application of digital currency in the field of cross-border payment is still in the early experimental stage. When the conditions for popularization are mature, the rapid development of the domestic business volume of the central bank's digital RMB will bring profound changes to the field of cross-border payment: on the one

hand, it will greatly improve the compliance of cross-border payment transactions; On the other hand, some of the businesses that benefit from the complexity and interoperability of cross-border payments may be challenged. China has been carrying out digital currency research and mobile payment pilot projects across the country since 2019. In February 2021, the Digital Currency Research Institute of the People's Bank of China announced the joint launch of the Multilateral Central Bank Digital Currency Bridge Research Project (m-CBDC Bridge) with the Hong Kong Monetary Authority, the Central Bank of Thailand and the Central Bank of the United Arab Emirates. The exploration of CBDC for external cross-border payment will be carried out to explore the application of digital RMB in cross-border payment. The application test shows that compared with the traditional cross-border payment process, the digital RMB is more simple and fast, the transaction cost is greatly reduced, and the speed and scale of cross-border transaction can be significantly improved. Combined with the above conclusions, this paper puts forward the following hypothesis theory as the basis for the development of digital RMB:

Hypothesis 5a (H5a) popularization of digital RMB in the domestic application market establishes the leading strategic advantage of China's digital financial system, which is conducive to the internationalization of digital RMB and the reform and innovation of the global financial system.

Hypothesis 5b (H5b) digital RMB internationalization will help promote the digital upgrading of China's industrial structure, optimize the foreign trade structure, and improve the effectiveness of the domestic financial crisis response mechanism.

Hypothesis 5c (H5c) The internationalization speed of digital RMB depends on the growth rate of the application capacity of domestic and foreign money markets.

To sum up, the digital RMB with national credit endorsement from the perspective of the political and economic environment of great power competition is helpful to realize the innovative development of the global financial system. China should accelerate the expansion of relevant innovative application scenarios of digital RMB and promote the internationalization of digital RMB, so as to seek the digital upgrading of domestic industrial structure and the innovative development of foreign trade financial system. In addition, the leading strategic advantage of digital RMB will certainly react to the rapid

development of the country's comprehensive national strength, and then build the digital integration and innovative development model of the real economy.

4 Theories and Opportunities of Development Advantages of Digital RMB

Combined with the above content, the internationalization path of digital RMB is faced with the dual effects of endogenous development advantages and external strategic opportunities at the present stage.

Digital currency has the advantages of monetary value and digital communication, and has the corresponding ecological development system, which is the inevitable product of the historical trend of human development rooted in modern digital technology. Digital currency has different ecological development trends because it is rooted in different value systems. We can understand that different ecological systems create different value scales of digital currency. That is, the difference in the degree of currency strength and the scope of transactions, which we call the strong money theory of digital currency. In the following, we will discuss this theoretical basis, and on this basis, seek breakthroughs in the theory of development advantages and development opportunities of digital RMB, so as to find a

path for the internationalization of digital RMB with practical significance.

4.1 Digital Currency Ecological Index K_e

In order to represent the theoretical basic characteristics of the strong currency of digital currency, this paper creatively introduces the digital currency ecological index K_e , digital currency market density index K_d , digital currency market willingness index K_q and digital currency market competitiveness index K_c based on the relevant experience of predecessors. The above indexes respectively represent different characteristics and directional performance ability of digital currency, as shown in Table 2, where K_e is the benchmark size of digital currency value and the market maturity indicator, which determines the basic indicator of digital currency ecological improvement degree and market strength; K_d is the proportion index of unit monetary capacity in the digital money market, which represents the transaction scope, quantity and frequency of the money market. K_q index shows the relevant characteristics of market subjects' money holdings, and represents the degree of market subjects' money holding willingness and the length of holding period; K_c index is an indicator of the competitiveness of the currency market, which determines the value consideration behind the currency and the voice of the pricing mechanism.

Table 2 Description of definitions of digital currency-related indices

Name of index	Symbol of exponent	Description	Second order characterization
Digital currency Eco-index	K_e	The benchmark size of digital currency value and the market maturity index determine the basic indicators of digital currency ecological improvement and market strength.	The base size of the currency value
			Maturity of the money market
Digital currency market density index	K_d	The proportion of unit money capacity in digital money market represents the transaction scope, quantity and frequency of money market.	The size of the currency trading range
			How many monetary transactions
			Magnitude of currency transaction frequency
Digital currency market willingness Index	K_q	It shows the characteristic indicators related to the amount of currency holdings of market trading subjects, and represents the amount of currency holding willingness and the length of holding period of market trading subjects.	Money market holding willingness size
			The length of the money market holding period
Digital currency Market Competitiveness Index	K_c	The index represents the competitiveness of the money market and determines the value consideration behind the currency and the discourse power of the pricing mechanism.	Credit value of money benchmark quantity (GDP)
			Voice Index of money Market (ratio of SWIFT)

The ecological index of digital currency (K_e) is based on its Value base level (Value: V), Technology capability (Technology: T), Application capability (Application: A) and Integration of innovation innovation: I) Important

index characteristics that represent the Growth, Inclusive, Balanced, Strong and Sustainable of digital currency on the future money market based on characteristics. The Digital Currency Eco-Index Model (DCEI) is created

based on this definition as follows.

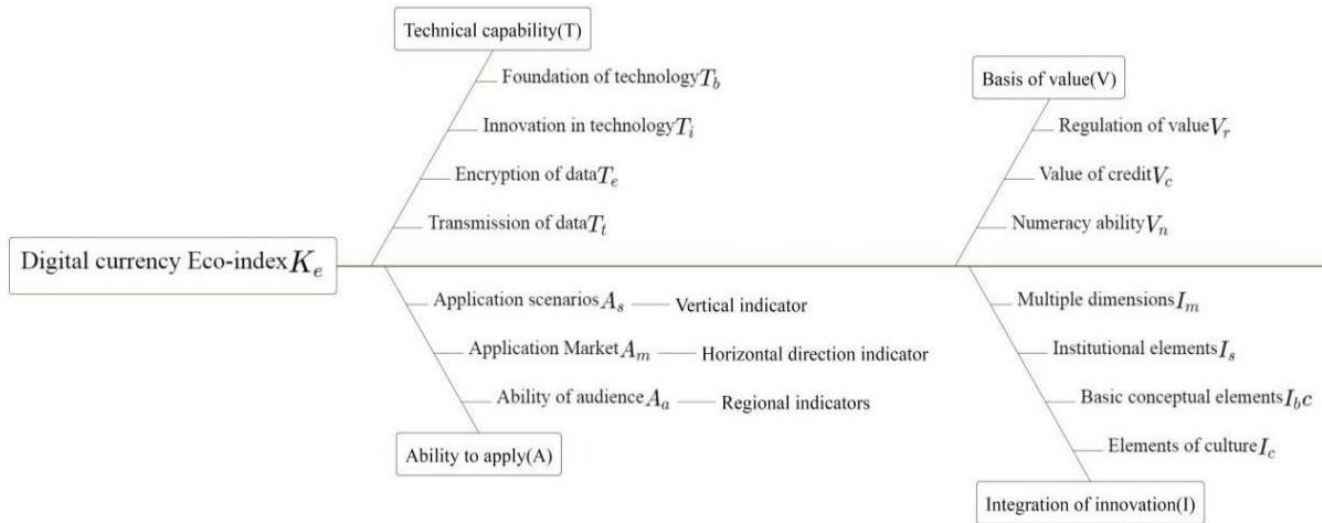


Figure 1 Digital currency ecological index (K_e)

The digital currency Ecological index (K_e) calculates the benchmark index value of digital currency by comparing the expected proportion of each element, and the specific calculation formula is as follows:

$$E(K_e) = \sum (f(x_v) + f(x_A) + f(x_T) + f(x_I)) \quad (1)$$

$$Y = f(x) = a + bx + \mu \quad (2)$$

Among them:

$$a = \frac{CPI}{GDP}, b = \frac{B_i}{(100 \times \overline{GDP})} \quad (3)$$

$$E(K_e) \in (0, 1] \quad (4)$$

In the above formula: x_v, x_A, x_T, x_I of the value rule is the scoring system and the corresponding achievement representing the ratio of industrial development scale to per capita GDP; \overline{GDP} is GDP per capita; Where B_i is the purchasing power index and CPI consumption index; μ is the evaluation error of other variables, which is related to political background, preferences, historical differences, etc. The expected value of digital currency ecological index (K_e) is between (0,1], $E(K_e) \propto 0$ means that the digital currency ecological index can only be positive, $E(K_e) = 1$ represents the uniqueness of currency; The value of function $f(x_{v,A,T,I})$ is directly proportional to the ratio of the size of

the corresponding industrial cluster in the country to \overline{GDP} per capita, purchasing power index B_i and consumption index (CPI), and is related to \overline{GDP} per capita.

The density index of digital money market K_d represents the proportion of unit money capacity in the digital money market, and the transaction scope, quantity and frequency of the money market. The value of the main indicator depends on the Trading scope (ts), Number of transactions (nt) and Frequency of transactions (ft) in the currency market. The digital currency market Willingness index K_q illustrates the characteristic indicators related to the amount of money held by the trading subjects in the money market, and represents the Willingness to hold money (hw) and the Length of holding period (hpl) of the trading subjects in the market. The digital currency market competitiveness index K_c represents the competitiveness index of the money market and determines the value consideration behind the currency and the discourse power of the pricing mechanism. It is represented as the product of the benchmark amount of money credit value (proportion of GDP per capita: %) and the discourse power index of the money market (proportion of SWIFT: %). If the coefficient values α, β, δ and μ are assigned to the main index values of K_e, K_d, K_q and K_c , the residual error is ε . The formulas are shown in 5.

$$SC = \alpha K_e + \beta K_d + \delta K_q + \mu K_c + \varepsilon \quad (5)$$

This paper holds that the theoretical basis of strong

currency is the digital currency ecological index (K_e), that is, the main representation coefficient of the theoretical basis of strong currency is K_e , and the main indicator of K_e is the value system and technological maturity of the digital currency itself. This index is the basic index index of digital currency, which integrates the application ability data and the index elements of integrated innovation and development ability in the value system of digital currency. This paper will analyze the digital currency

ecological index (K_e) and related main influencing factors to obtain the development strategic advantages of digital RMB, and finally explore the development opportunities and path model of digital RMB internationalization. Figure 2 below shows the characteristics related to the growth characteristics of digital RMB, which mainly depends on the composition and proportion of the factors related to the performance indicators of digital currency ecological index (K_e).

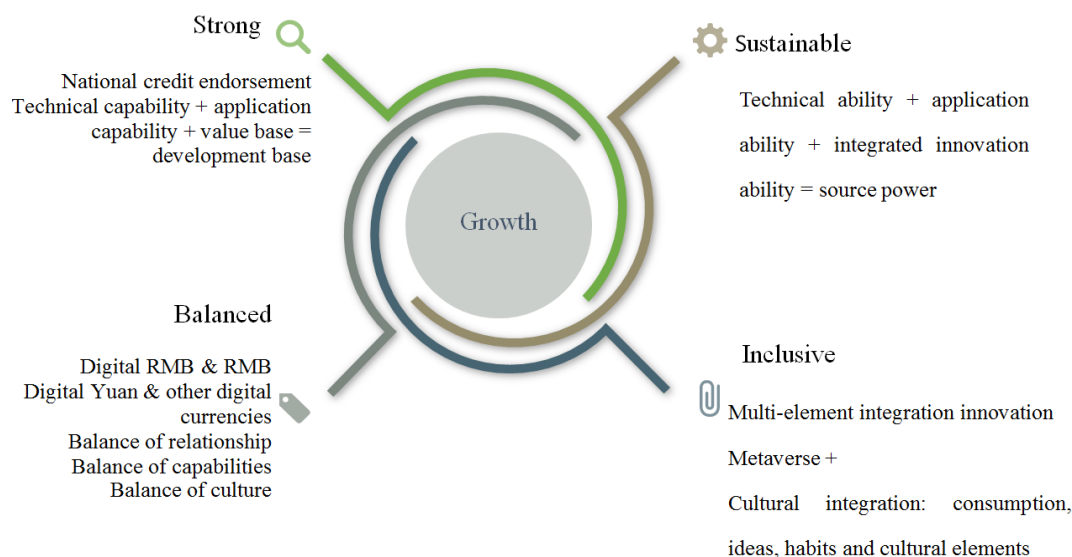


Figure 2 Growth characteristics of digital RMB

According to the above characteristic elements, it can be seen that the development of digital RMB itself requires the establishment and improvement of the sustainability of the technological development of digital RMB, and the comprehensive, balanced and inclusive multi-element integrated development mode, so as to comprehensively shape the basic capacity of the development of strong currency internationalization, thus providing basic ecological conditions for the internationalization of digital RMB.

4.2 Leading Strategic Advantages of Digital RMB

In view of the current development of digital economy and the wide development and use of digital currency, most economists believe that the basic concept of money that has existed for centuries is being challenged by the digital currency endorsed by the new credit value system. This paper holds that digital currency can be understood as a new digital credit value currency with rights

endorsement in a certain range of credit value system. The endorsement scope and benchmark value of credit rights of digital currency determine the breadth and depth of application scenarios of this type of digital currency. According to the above, it can be expressed that the strength of digital currency ecological index represents the future international market share of digital currency.

First of all, Aysan et al. believe that cryptocurrency is a kind of digital currency, and its value is determined by the law of supply and demand (Aysan et al., 2020). From the extension process of money evolution, it can be concluded that money represents exchange value and credit value simultaneously. Therefore, if digital currency wants to realize the function of exchange value, it needs to have sufficient economic foundation and credit for endorsement, and have the functions of exchange medium and store value currency, so that it becomes a bank liability asset in the full sense. Shao Yu and Chen Dafei (2019) proposed that taking the lead in issuing digital currency is an important way to promote the internationalization of RMB. The legalization of digital

RMB is China's leading strategic advantage in the field of new financial revolution. Ahmet Faruk Aysan and Farrukh Nawaz Kayani (2021) see a digital yuan as part of efforts to internationalize the yuan and reduce reliance on the dollar-dominated financial system, with the People's Bank of China (PBOC) becoming the first major central bank to issue a digital yuan (CBDC). China is trying to use the first-mover strategy and leverage its position to promote a trade strategy settled in digital RMB [19]. Of course, the internationalization process of digital RMB is different from the currency internationalization process of global financial market subjects within the existing monetary system. China first needs to win the confidence of global users in the strength of China's financial system and the security of digital RMB. China's financial currency needs to further expand the market openness. While maintaining the vitality of the currency and excellent credit rating, promote the continuous expansion of the strategic leading edge of digital RMB. Therefore, the central bank digital RMB endorsed by the national credit value system has become an important strategic value leading advantage to promote the internationalization process of the RMB value system.

Secondly, Ahmet Faruk Aysan and Farrukh Nawaz Kayani (2021) argued that the current third-party mobile payment system in China is mainly dominated by wechat and Alipay digital wallets, and hundreds of millions of Chinese people use their own mobile payment services [19]. Yi Gang (2021) believes that: first, the design and use of digital RMB are mainly to meet the needs of domestic retail payment; second, combined with the pilot promotion, the design and use of digital RMB should be improved in a targeted manner. One is to establish a management mode suitable for digital RMB by referring to the ideas of cash and bank account management; Second, continue to improve settlement efficiency, privacy protection, anti-counterfeiting and other functions; Third, promote the interaction between digital RMB and existing electronic payment tools to achieve safe and convenient unification; Fourth, improve the construction of digital RMB ecosystem and enhance the universality and availability of digital RMB [20]. Lee et al. (2021) argue that the DCEP framework consists of one CBDC, two databases, and three centers. One such CBDC refers to a comprehensive economic policy document issued by the Chinese government. The two databases refer to the two-tier system run by the Central Monetary Policy Committee (Lee et al., 2021) so that the central bank does

not issue digital currency directly to the public. Instead, it first issued currency to small commercial banks, which in turn issued it to their customers. Upon completion of the registration process, the bank will issue a digital wallet to the customer (Louie and Wang, 2021). According to the development and design approach of digital RMB combined with the concept of "metaverse +", the integration and innovation of digital economy and industry are fully considered, and the integration of "mass entrepreneurship and innovation" at the technical basic level and application level of digital RMB is promoted, so that the internationalization of digital RMB has certain technological leading advantages.

Third, the first-mover advantage of China's e-CNY is important because it is the key to global dominance. The new digital currency system not only affects China's monetary system, but also has the ability to transform the global monetary system. Scholars believe that the early development of DCEP will contribute to the internationalization of China's currency (Knoerich, 2021). As of 2021, more than 80% of payments in China are made through smartphones, the highest mobile payment penetration rate in the world (Knoerich, 2021). Xiong Jun, a member of ICBC Asia Digital Currency Research Group, and others believe that the login of digital RMB APP to APP Store and major Android app stores on January 4, 2022 marks the expansion of the pilot distribution channel of digital RMB from bank links to pilot groups in pilot areas to more potential public groups through mass application distribution channels. The pilot mode and scope are accelerating. The extensive application of digital RMB in the e-commerce mode of snack business will comprehensively expand the depth and width of digital RMB in the field of digital exchange currency. In addition, as the world's largest import and export trading country and its huge market volume, China has become the leading advantage in application capacity to drive the internationalization of digital RMB.

Finally, in 2016, the RMB joined the ranks of the US dollar, the euro, the Japanese yen and the British pound to become a member of the Special Drawing Rights currency basket, which is the most important milestone in the process of RMB internationalization (Zhang et al., 2021). At the same time, countries with friendly relations with China strongly hope to use RMB as a substitute for US dollar in the global market, especially those countries located along the Belt and Road (Lin et al., 2017). It is a qualitative leap for the renminbi's position in global

financial markets. The Belt and Road Initiative can therefore be seen as one of the main drivers of the internationalization of the renminbi, as part of China's efforts to replace part of the value base of the dollar in the global market. In addition, according to the comprehensive effect of various factors such as the changes in the international situation and the changes in the global financial market, the sovereign currencies of different countries are affected differently by the above factors, which reflects that the value composition system of sovereign currencies will have some changes, which will help accelerate the process of the internationalization of China's currency.

The scale of cross-border renminbi flows rose from 0.6 trillion yuan in 2010 to 37 trillion yuan in 2021, reflecting the strength of capital account opening, with yuan-denominated trade volumes rising tenfold to 5.8 trillion yuan, Spence said. In 2021, capital account receipts and expenditures denominated in RMB amounted to 29 billion yuan, reflecting the increased cross-border use of RMB. According to SWIFT, the share of RMB in international payments increased to 2.7% in December 2021, overtaking the Japanese yen to become the world's fourth payment currency, and further increased to 3.2% in January 2022, hitting a record high. According to the official foreign exchange reserve currency Composition (COFER) data released by the International Monetary Fund (IMF), RMB accounted for 2.88% of global foreign exchange reserves in the first quarter of 2022, up 1.8

percentage points from 2016, when RMB first joined the Special Drawing Rights (SDR) currency basket, ranking fifth among major reserve currencies. In May 2022, the International Monetary Fund raised the weight of the renminbi in the Special Drawing Rights (SDR) from 10.92 per cent to 12.28 per cent, reflecting recognition of the renminbi's greater freedom to use.

This paper argues that the early launch of e-CNY will help China to achieve the degree of participation in currency internationalization, so as to maintain the balanced development of the existing global financial system. While China's initial focus is on international payments, in the medium and long term, it wants to promote the renminbi as an international reserve currency and investment currency, ultimately breaking the currency monopoly and reforming the global inclusive financial system. The successful internationalization of the digital RMB not only requires China to win the confidence of global users in China's economic strength, financial system and the functionality and security of the digital RMB, but also to maintain the safe and reliable operation system of the new financial inclusion system and integrate the development demands of different economies and regional economies through innovation and development. Based on the above analysis, the leading strategic advantages of the People's Bank of China in the development of digital RMB are summarized and shown in Figure 3.

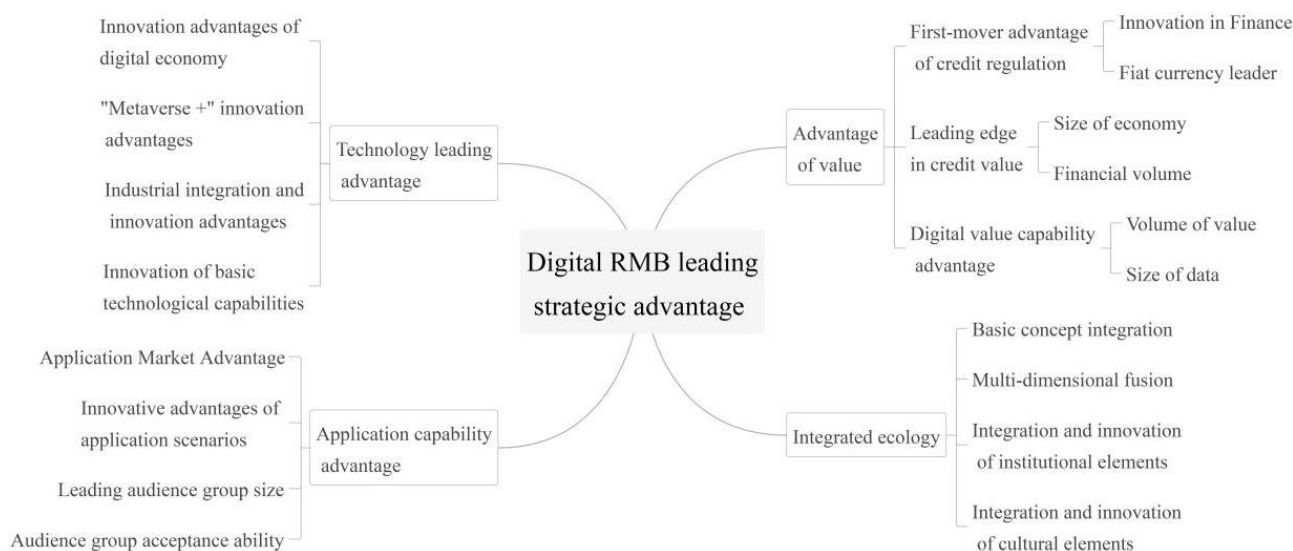


Figure 3 Leading strategic advantages of the People's Bank of China's digital RMB

Compared with other countries at the present stage of development, the digital RMB of China's central bank has

a leading strategic advantage. This leading strategic advantage will gradually expand with the development

process of digital economy, and the digital RMB will gradually expand to become the most important pole in the global new financial payment value system. To this end, the central bank has made a long time of exploration efforts and actively promoted the internationalization process of digital RMB.

On October 8, 2015, the Cross-border Interbank Payment System (CIPS) was officially launched. CIPS is an independent payment system organized and developed by the People's Bank of China, aiming to further integrate the existing RMB cross-border payment settlement channels and resources. Improve the efficiency of cross-border clearing, meet the needs of RMB business development in major time zones, improve the security of transactions, and build a fair market competition environment. On January 16, 2021, SWIFT has established a joint venture with China, which shows that SWIFT is aware of the importance of digital currency, which is likely to subvert the existing currency form. Therefore, it tries to cooperate with leading strategic advantages of economies to discuss the scheme of using digital currency to optimize the cross-border payment and settlement system. At present, the US dollar is still the final use currency for payment and settlement in the SWIFT system, which plays a great role in maintaining the international status of the US dollar. If China and SWIFT jointly build an international payment and settlement system with the central bank digital RMB as the intermediate value currency, it will have a new significance to improve the international application level of the central bank digital RMB. It will also promote the construction of a new international financial system.

4.3 Development Opportunity Model of Digital RMB

As far as the current situation is concerned, it is difficult for cross-border payment systems to leave the SWIFT network. Some international events in recent years reflect the fact that SWIFT has an official position under special circumstances. The establishment of a new payment and settlement system based on the leading strategic advantage of digital RMB may become an important starting point to deal with US hegemony and RMB internationalization. The development of digital finance can break the data islands and realize the cost reduction and efficiency increase of financial services.

The new revolution in the financial payment system

will help promote the development of global free trade. The development and evolution of digital twin and digital symbiosis in the metaverse is bound to lead mankind to break through existing technological barriers and achieve cross-domain development in both space and time. It is another catalyst for the scientific and technological revolution in human society, conducive to the comprehensive leap forward development of the community with a shared future for mankind, and the beginning of mankind's journey to outer space civilization. The digital RMB is developing and growing with the development of China's economy and the new fintech revolution, and is a perfect supplement to the current needs of the international financial system. With the development and expansion of the corresponding industrial economy and the breakthrough development and integration of the current world pattern, the digital RMB is bound to fully enter the international stage.

Flandreau&Jobs put forward that the network externality of currency is an important factor affecting the level of currency internationalization. The reduction of transaction costs will make more market players choose this currency for valuation, settlement and reserve.

Liu and Zhang (2018) pointed out that the Belt and Road Initiative has opened up a new channel for China's foreign investment, the status of RMB in Central Asia and other inland regions will be greatly improved, and the development of emerging markets will promote the use of RMB. Wu and Sha (2019) estimated the weight of RMB in the currency basket of countries along the Belt and Road, and found that although the US dollar was still the most important currency in the basket, the weight of RMB in some currency baskets of countries along the Belt and Road had exceeded that of traditional currencies such as British pound and Japanese yen. Wang Hao (2021) believed that China should actively use RMB for settlement in supporting the infrastructure construction of Central Asian countries, and convert foreign exchange assets into investment in countries along the Belt and Road, so as to promote the role of RMB as an anchor currency, which he believed would help promote the regional currency effect and internationalization of RMB.

Xu Qiyuan, Lei Yu, Sun Liaoying, Xiong Yuting, Xiong Aizong, Hong Shijian (2022), in the paper "Debt Crisis engulfing Developing Countries: How China Responds to It", argues that under the circumstances of rising global inflation, accelerating monetary policy transformation in the US and Europe, and the onset of a strong US dollar

cycle, developing countries' debt management and foreign exchange acquisition capacity will face severe challenges. According to the IMF, the debt service burden of middle-income developing countries is already at its highest level in three decades. In addition, of the 69 low-income countries, eight were in debt distress and 30 were at high risk as of the end of March 2022, accounting for 55 percent of all low-income countries. The debt crisis in developing countries has become another important risk to the global economy this year.

Xu et al. (2022) argue that a long-term solution to the debt problem requires addressing the necessary financing needs of developing countries for fighting COVID-19 and sustainable economic development. The new debt financing plan is based on the SDR credit enhancement structure, combined with the experience of green debt replacement and social impact bonds, and designed new financing instruments specially used for anti-epidemic needs such as vaccine popularization. Developing countries could swap their outstanding debt for renminbi, or SDR, to reduce their use of the dollar. Especially in

terms of issuing SDR valued bonds, China is the only country that has successfully issued SDR bonds in the past 30 years, and it also has certain advantages in this respect. To some extent, the plan will also help promote the internationalization of the renminbi. Replacing part of the stock debt with bonds will help gradually realize the transparency of creditor's rights information and the alignment with international rules. In the process, bilateral loans between China and developing countries will be swapped for bonds issued in the international financial market. This in itself is a process of increasing transparency and aligning with international rules. At the same time, the nature of some of China's original foreign loans is controversial, and the nature of loans can be further clarified as creditor's rights held by investors in the international bond market through replacement, which will better protect China's overseas creditor's rights.

To sum up, this paper summarizes the market competitiveness model of the People's Bank of China's digital RMB as an international currency, which is shown in Figure 4.

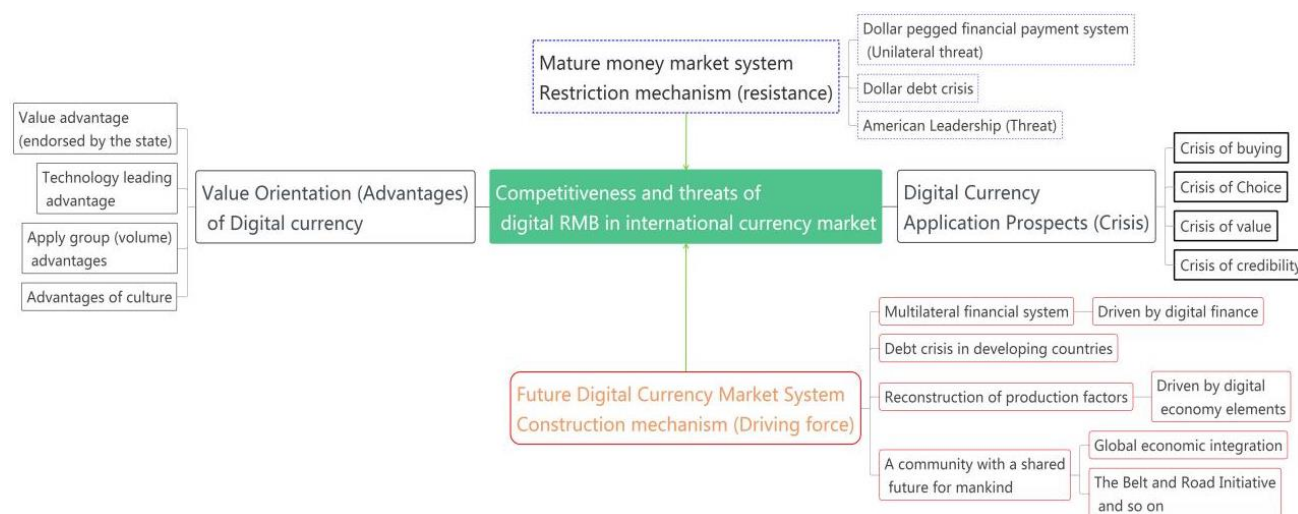


Figure 4 Competitiveness model of digital RMB international currency market

The outbreak of COVID-19 has had a severe impact on the global economy and is a setback to the process of globalization. In the face of the increasingly negative impact of the epidemic on globalization, changes in epidemic prevention and control policies of various countries will have varying degrees of impact on the recovery and sustainability of their economies, which is both an opportunity and a challenge. One of the elements needed for economic activities is circulation vitality. Different circulation vitality or expressed as different degree of hindrance to the vitality of the economy will

cause different degrees of restriction, history shows that only development is the basis for solving all problems. China's domestic epidemic prevention and control measures have undergone relative changes with the development of the post-epidemic era, which has become an important obstacle restricting the healthy development of the economy and the nation. If they cannot be adjusted in time according to the development and changes, they will become a stumbling block for the development of digital RMB and the revolution of new financial technology. In addition, artificial barriers to economic

circulation will cause continuous outflow of domestic capital, widen the gap between the rich and the poor in China, and undermine the national faith and cohesion of the people. The attractiveness and potential of the Chinese market will be more misunderstood, hindering the sustainable development of the national strategy. China's lack of faith will have a negative impact on economic development, and further block the internationalization process of digital RMB.

5 Research on the Development Path of Digital RMB Internationalization

In the face of the tumultuous changes in the international political and economic landscape and the development of various uncertain factors such as "black swans" and "gray rhinos", the internationalization of the digital RMB of the People's Bank of China will be a long-term struggle. This road will not be smooth and requires excellent wisdom and perseverance to complete. Today's world is still dominated by development, peace and coexistence, and it is impossible for China to copy the process of sovereign currency globalization of the United Kingdom and the United States. In the future, the world is bound to be a multi-polar and multi-coexistence integrated world model of global economic integration. Therefore, the internationalization of RMB and digital RMB means that RMB and digital RMB have become an important pole of the diversified financial system. It is to seek the common development pattern of inclusive finance.

First of all, it is undeniable that great power competition helps to promote the globalization process of digital RMB, and is a catalyst and new development path for the popularization of digital RMB globalization. Since the Russia-Ukraine conflict, the United States has influenced the Western world to use its own economic and financial advantages to exclude Russia from the SWIFT system and impose comprehensive sanctions on Russia. Russia, on the other hand, takes advantage of its own superior natural endowments to initiate the reform of the EU's trade and payment system. In addition, the Sino-US trade dispute has prompted China to promote regional economic cooperation strategies such as the Belt and Road Initiative, gradually increase the frequency and scale

of RMB and digital RMB trade settlement within the framework of regional economic cooperation, and promote the reform of international trade payment system. At the same time, different free trade areas and economic alliances tend to adopt more flexible trade payment methods to avoid the exploitation of US dollar hegemony. The above new changes in payment and settlement methods due to great power competition can help further promote the further internationalization of the RMB and the digital people.

Secondly, the economic and trade exchange needs among different regional economic communities are different, and the global economic and trade needs to change the trade payment system dominated by the US dollar, so as to increase the economic wealth opportunities of the region or the country through this change. In short, the world needs this change. The world today is facing profound changes unseen in a century. The new industrial technological revolution has promoted the innovation of the global economic and trade model, which needs the support of a diversified financial system. Technological progress has promoted the continuous optimization and adjustment of the global industrial structure, and globalization is bound to cause a new competition pattern for the reconstruction of social production factors. This change caused by the new industrial technology revolution is conducive to the mild reconstruction of the global political and economic diversification pattern, conducive to the integration and innovation of the financial system, and this development trend helps to promote the internationalization of RMB and digital RMB.

Thirdly, the process of globalization viewed from the perspective of a community with a shared future for mankind is a process of integration and innovation of major Eastern and Western civilizations, which has been gradually accelerated since China's reform and opening up. Major eastern economies such as China, Japan, South Korea, India, Singapore, Malaysia, and the Arab countries in the Middle East have pioneered the construction of regional political and economic systems on the basis of continuous integration of Eastern and Western civilizations, and gradually realized the sublimation of the eastern pole. Through continuous learning, integration and innovation, it has built a variety of pioneering economic community frameworks and structures, and gradually expanded its ability to influence the world. Globalization and regional economic cooperation organizations have

promoted the construction of a community with a shared future for mankind and enhanced international economic and trade cooperation and exchanges. With the development of digital economy, the small development and expansion of the frequency and scale of the use of RMB and digital RMB will promote their further internationalization.

Fourthly, according to the leading strategic advantage and competitiveness model of digital RMB, it can be concluded that the internationalization of digital RMB is an inevitable development trend.

To sum up, Figure 5 below shows the development path of digital RMB internationalization.



Figure 5 Development path of digital RMB internationalization

As can be seen from the above, the internationalization of digital RMB needs to pay attention to the process of technological innovation and development of the new industrial revolution while maintaining and developing the leading strategic advantages, which is an indispensable element in the path of internationalization. The perspectives of great power competition and a community with a shared future for mankind focus on the external environment elements, which provide opportunities and environment for the internationalization of digital RMB and determine its internationalization speed. As long as the size of the internal driving factors maintains a sufficient dominant position, the digital RMB is bound to achieve internationalization, that is, the depth and width of the domestic application of the digital RMB determine its internationalization achievements.

In addition, at the present stage, the process of currency internationalization should strive to build a strong currency economic and political foundation, and the long-term beneficiaries of great power competition will always be the latecomers. Doing a good job in the field of trade and finance, paying attention to the hard power construction and development behind the great power competition, and exploring the win-win cooperation market, the great power competition will certainly promote the pace of changes in the world political and economic pattern, only a solid economic and political construction foundation can occupy the initiative in the monetary and financial market.

6 Conclusions and Policy Recommendations

Through the research on the background of great power competition and the strategic advantages of digital RMB development, this paper finds out the internal and external driving factors of digital RMB internationalization, and makes a detailed analysis of the driving factors. In addition, this paper puts forward the concept of digital currency ecological index and other concepts to explain the strong currency theory of digital currency. The main influencing factors and internationalization paths of digital RMB internationalization obtained in this paper provide certain reference value for the design and innovation of digital RMB in China at the present stage, and provide development research direction for the

innovation and development of digital economy. This paper suggests that the foundation of the digital RMB internationalization process lies in the development level of the internal driving factors, that is, to pay attention to the economic and political foundation of strong currency, that is, only to continuously improve the level of national political and economic development is the fundamental place to promote the digital RMB internationalization, is the main element of internationalization; External environmental elements such as great power competition and globalization from the perspective of a community with a shared future for mankind are the catalysts for the internationalization of digital RMB, providing the soil for leapfrog development and achieving stimulating and accelerating effects.

Based on the above conclusions, this paper puts forward the following policy suggestions on the path of digital RMB internationalization:

First of all, do a good job in the marketization of domestic digital RMB, expand the depth and width of the application scenarios of digital RMB, and create the market advantages of twin digital economy. Strengthen the advantages of building the ecological index of digital currency, improve the industrial chain of digital RMB, maintain the advantages of technological innovation, break through the blocking effect of traditional consumption habits, and constantly enhance the user stickability of digital RMB. Secondly, we should innovate and develop the application hierarchy model of digital RMB to improve the value system of digital RMB to enable innovation. Digital RMB discovery and value to realize the diversification of the system, enhance the initiative of digital RMB application, and realize the construction of inclusive financial system. Third, we should promote the open development of national politics and economy through flexible and open monetary policy, implement policies to encourage the implementation of high-tech projects, and promote the integration and innovation of traditional industries to realize the digital reconstruction of local industries. Fourth, diversified economic entities should be encouraged to jointly promote the integration and innovation of the new industrial revolution and traditional industries, realize the development of leading technological advantages, and compete for the dominant power in the development of the new industrial revolution. Fifth, realize globalization under the new development pattern and provide

opportunities and paths for globalization under the community with a shared future for mankind.

To sum up, this paper believes that under the background of great power competition, there are more opportunities than challenges for the development of digital RMB. China should comprehensively, actively and steadily expand the free convertibility ratio of RMB and gradually form a strong currency system. At the same time, while constantly strengthening its own development elements, it should deal with external crises with a peaceful mind, turn challenges and crises into opportunities, and make full use of the intelligent development opportunities of "artificial intelligence + digital economy" to achieve the final qualitative leapfrog development of political economy. Therefore, this paper believes that great power competition is one of the most important and indispensable development factors for the current digital RMB internationalization.

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