

Research Article

Recent Developments and the Causes of Globalization for the Chinese Yuan Based on Statistical Analysis

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We analyze the spatial evolutionary path and spatial evolutionary features of Renminbi (RMB) internationalization from three aspects: transaction intermediary, invoicing unit, and value storage. The main results show that: Firstly, the internationalization of RMB exhibits a certain path expansion pattern, such as initially expands to East Asian countries and regions, then gradually moves to Southeast Asia, Europe, South America, and Australia, and participating countries in the Belt and Road initiative. Secondly, the RMB settlement of cross-border trade presents the “coast-border-inland” spatial characteristics. Thirdly, bilateral currency swap shows “rapid growth” and “unbalanced growth.” Finally, the spatial structure of RMB internationalization has the significant features such as “from points to the area and from lines to the area.”

1. Introduction

The process of a currency growing from national to international is a process that continuously expands its currency functions performed in the international context. An international currency can simultaneously play the role of transaction intermediary, invoicing unit, and value storage [1]. The internationalization processes of the world's major international currencies (sterling, dollar, euro, etc.) all display geospatial evolutionary features (Lin Lefen, Wang Shaonan, [2]). Because of the influences of economics, politics, and other factors under different historical backgrounds, the world's major international currencies appear different spatial evolutionary structural characteristics.

From the spatial evolutionary characteristics and determinants of Sterling, Dollars, and Euro, currency internationalization is inseparable from a strong economic and political foundation. However, the internationalization path of each currency is different under a specific historical background. Therefore, they provide different insights and experiences for advancing the process of RMB internationalization.

After 44 years of deepening market-oriented reforms, China's economy has grown rapidly and has made remarkable achievements in terms of economic volume and trade volume. China is starting to play a significant role on the international historical stage both in economics and politics. Correspondingly, the RMB is also gradually advancing the internationalization process through cross-border trade settlement, the establishment of bilateral domestic currency trade agreements, and the layout of offshore RMB financial centers. By 2018, cross-border RMB receipt and payment business have been launched in 242 countries and regions, bilateral local currency swap agreements have been signed in 39 countries and regions, and RMB settlement arrangements have been established in 24 countries and regions. In 2021, the aggregate amount of China's cross-border RMB receipt and payment has reached RMB36,600 billion. This paper focuses on the spatial expansion paths and structural characteristics of RMB in the internationalization process, which would be different from the world's major international currencies discussed above. The analysis is demonstrated from the three major functions of a currency: transaction intermediary, invoicing unit, and value storage.

The rest of the paper is organized as follows. The second section is the main body of this paper. We analyze the spatial evolutionary path of RMB internationalization. The process of RMB internationalization is studied with the following five aspects; settlement in cross-border trades, bilateral currency swap agreements, as an international reserve currency, offshore financial centers, and Belt and Road initiative (Wu Shuyu, Li Daokui, [3]). Section 3 analyzes the structural characteristics of the spatial evolution of RMB internationalization and the main factors to determine the evolutionary pattern. The fourth section concludes there were 40 countries and regions in which the central banks or monetary authorities have signed bilateral currency swap agreements with the People's Bank of China by the end of June 2022, and 25 countries and regions have established RMB clearing mechanisms with China by the end of 2020 [4](source: <http://www.pbc.gov.cn>).

The internationalization of the RMB is a process in which the spatial scope of the monetary function continues to expand. It is essentially a spatiotemporal phenomenon; that is, based on the comprehensive strength of the country, and driven by national policies, the spatial scope of RMB performing its international monetary function is expanding with the migration of time.

The Chinese Yuan is the only currency of a developing country that entered into the Special Drawing Rights (SDR) basket of the International Monetary Fund (IMF). The process of RMB internationalization has been deeply developed in various forms such as cross-border business, currency swaps, and offshore business since RMB is official to be used in cross-border trade settlement in July 2009. Some breakthroughs have been achieved in major areas such as that the ranking of RMB used as international payments has continuously increased, RMB has joined the special drawing rights (SDR) in 2016, and different spatial divisions have been formed. The process of RMB internationalization has formed its spatial structure and spatial characteristics. To our knowledge, there is not much research on the geospatial evolutionary path and evolutionary characteristics of currency internationalization in the literature. The main current situation of RMB internationalization is as follows [5].

In the aspect of international payments, according to SWIFT data, the RMB is the fifth largest global payment currency in the world, accounting for 2.20% of all global currency payments in July 2022 (source: <http://www.swift.com>).

In the aspect of cross-border trade RMB settlement and cross-border RMB receipts and payments, it has officially promoted the internationalization of the RMB in China through cross-border trade using RMB settlement since 2009. The cross-border trade RMB settlement amount was only 3.580 billion Yuan in 2009. China's cross-border trade RMB settlement amount reached 7.94 trillion Yuan in 2021, which is about 2218 times compared that of 2009. The RMB has been China's second largest international payment currency for eight consecutive years, and the cross-border RMB payment in 2020 reached 45.27 trillion Yuan by CIPS (Cross-border Interbank Payment System). There were 75.07% of the RMB offshore market receipts and payments occurred in Hong Kong in June 2020 (source: <http://www.pbc.gov.cn>).

In the aspect of reserve currency, the RMB entered the currency basket of the International Monetary Fund as a separate currency and became one of the world's eight official foreign exchange reserve currencies in the fourth quarter of 2016 with a share of 10.92%. The absolute value of the RMB as a foreign exchange reserve currency was US\$90.288 billion, accounting for 1.07% of the world's eight major currencies, ranking seventh among the world's eight major foreign exchange reserves, only higher than the Swiss franc in the fourth quarter of 2016. There were at least 70 central banks or monetary authorities around the world which take RMB as their foreign exchange reserves, making the RMB the fifth largest reserve currency in the world by the end of the fourth quarter of 2019. The RMB continues to maintain its international status as the world's fifth largest reserve currency in the first quarter of 2022. The absolute value of the RMB as foreign exchange reserves in quarter 1 of 2022 was 336.39 billion US dollars, accounting for 2.88%, surpassing Canadian dollars, Australian dollars, and Swiss francs. The share of RMB in the IMF currency basket increased to 12.28% in May 2022 (Source: <http://www.imf.org>).

In addition, the RMB has become the world's third largest trade financing currency, accounting for 3.07% in July 2022. It is the fifth largest spot foreign exchange currency (source: <http://www.swift.com>).

There are tons of research works and literature on RMB internationalization. Cheung et al. (2019) studied the spatial pattern of the geographical distribution and diffusion of RMB; however, they focused on offshore transactions. Based on the meaning of international currency which is a natural extension process from the national scope to the international scope (Li 2013), we comprehensively examine the spatial structure characteristics formed by RMB's currency functions exceeding its original using areas. Li (2009) interprets currency internationalization as a dynamic process that some or all functions of a currency expand from its original using area to neighboring countries or regions and finally evolve into a global universal currency. From circulation means, payment, invoicing and value storage, and the four major functions of currency, we examine the spatial pattern formed by the gradual expansion of using RMB in the world. Thereby, we try to refine the rules and insights in the process of RMB internationalization [6–8].

The rest of the article is as follows: Part 2 mainly analyzes the performance of RMB's international currency functions, including circulation, payment and settlement, and value storage. Part 3 mainly analyzes the reasons for RMB's spatial evolution and its spatial characteristics. Part 4 is the conclusion and outlook.

2. RMB Performs International Currency Functions

We discuss the space expansion paths of the RMB in the past ten years from the perspective of RMB fulfilling different functions such as the means of circulation, means of payment, and value storage.

2.1. RMB Performs International Circulation Currency. The RMB has gradually become a currency in circulation in some regions outside China, mainly in parts of the three Southeast Asian countries, including Myanmar, Vietnam, and Laos, which border China's Yunnan Province. Due to China's political stability, sustained and stable economic growth, and stable currency value of RMB, the RMB has gradually been trusted and accepted by people in these border areas. In some areas, the RMB has even replaced the local currency, becoming the local hard currency and circulated and used locally. For example, in the second special zone of Shan State in Myanmar (Myanmar Wa State), the RMB has become the local currency instead of the Myanmar kyat and the US dollar. In the three northern provinces of Phongsali, Nanta, and Urumsai in Laos, the usage of RMB in cash is greater than that of Laos Kip. Vietnamese residents on the Sino-Vietnamese border also generally hold RMB in cash as the main currency in circulation [7–10].

2.2. RMB Performs Payment and Settlement Functions

2.2.1. The Ranking and Proportion of RMB as an International Payment Currency. When China officially promoted the internationalization of the RMB, the ranking of the RMB among international payment currencies was relatively low. In the second year of China officially promoting its internationalization, the RMB as an international payment currency ranked only 35th in October 2010 [11]. In recent years, the RMB's ranking among international payment currencies has greatly improved, and is roughly stable between the 5th and 7th international payment currencies, as shown in Table 1.

2.2.2. Cross-Border Trade RMB Settlement and Its Geospatial Evolution Characteristics. The geospatial evolution of RMB settlement in cross-border trade has gone through the following three stages.

In July 2009, China officially launched the RMB settlement in cross-border trade. There were only Shanghai and 4 cities in Guangdong Province (Guangzhou, Shenzhen, Zhuhai, and Dongwan) within the inland territory of the settlement pilot, and only Hong Kong, Macao, and ASEAN countries within the overseas territory [12, 13].

In June 2010, the People's Bank of China and other 5 ministries and commissions jointly issued the "Notice on Relevant Issues Concerning the Work of Expanding the Pilots for RMB Settlement in Cross-border Trade." The inland pilots have been expanded to 20 provinces (autonomous regions and municipalities)^① Specifically, these regions include Shanghai, Guangdong, Beijing, Tianjin, Neimenggu, Liaoning, Jilin, Heilongjiang, Jiangsu, Zhejiang, Fujian, Shandong, Hubei, Guangxi, Hunan, Chongqing, Sichuan, Yunnan, Xizang, and Xinjiang., and the overseas pilots have covered all countries and regions [14].

In July 2011, the People's Bank of China and other 5 ministries and commissions again jointly issued the "Notice on expanding the RMB settlement areas in cross-border trade." RMB settlement in cross-border trade within an inland territory has expanded to the whole country [15].

TABLE 1: RMB as an international payment currency.

Time	Ranking of RMB as an international payment currency	Proportion (%)
Oct. 2010	35	
Oct. 2011	17	0.29
Oct. 2012	16	0.42
Oct. 2013	12	0.84
Oct. 2014	7	1.59
Oct. 2015	5	1.92
Oct. 2016	6	1.67
Oct. 2017	7	1.46
Oct. 2018	6	1.7
Oct. 2019	6	1.65
Oct. 2020	6	1.66
Oct. 2021	5	1.85
July. 2022	5	2.20

Source: <http://www.swift.com>.

Figure 1 exhibits the spatial evolutionary process of the cross-border RMB settlement pilot areas from July 2009 to July 2011. China started to introduce RMB internationalization in 2009, which is why we took the data from 2009 to 2011 for this study. We cannot choose the data from 2000 to 2011 as the RMB internationalization pilot was not launched in these years. One can see that it is a quick process that the cross-border RMB settlement areas increased from 5 cities to the whole world. The spatial evolutionary structure shows a "coast—border—inland" characteristic.

The spatial expansion process of the RMB settlement pilots for cross-border trade in the domestic territory presents the spatial structure characteristic of "coastal—border—inland." There are three main reasons for this kind of characteristic:

Firstly, the degree of openness and the level of international trade in coastal cities is relatively high in China. According to the data from the National Bureau of Statistics, in the first year of the pilot RMB settlement in cross-border trade (2009), the total import and export volume was 220.7535 billion US dollars in the whole country. As the first group of domestic pilot regions, Shanghai, Guangzhou, and Shenzhen contributed 28.3% of the total import and export trade volume, which was as high as 624.622 billion US dollars. The relatively high degree of openness and the high level of international trade is the main reason why these coastal cities were selected as the first batch of pilots (source: <http://www.pbc.gov.cn>).

Secondly, the provinces along the border have relatively geographical advantages. As shown in Figure 1, the second batch of pilots not only included coastal provinces but also expanded to all provinces along China's borders. These provinces have geographical advantages over different countries in Asia. One of the important reasons to identify this pilot is to expand the cross-border use of RMB in international trade through geographical advantages.

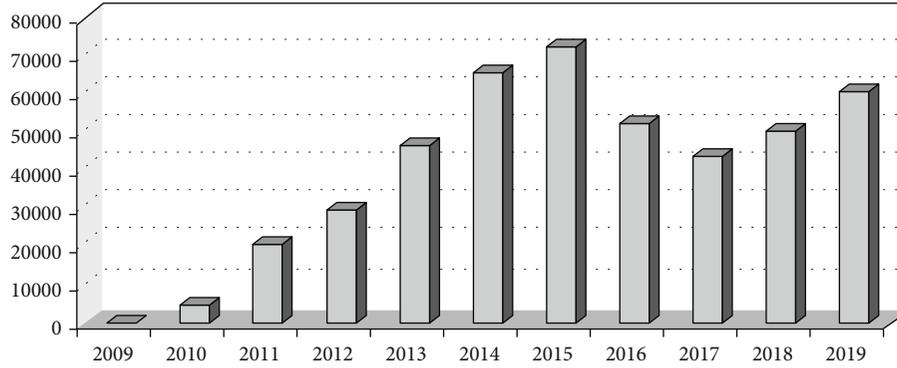


FIGURE 1: The cross-border RMB Settlement from 2009 to 2019. Source: <http://www.pbc.gov.cn>.

Thirdly, RMB internationalization is the strategic requirement for a complete national plan. After two pilot schemes, to accelerate the pace of RMB internationalization, it is necessary to concentrate the resources of all provinces across the country to further expand the cross-border use of RMB worldwide. In terms of the degree of openness, international trade, and geographical advantages, inland provinces and regions are less than coastal cities. However, the national development strategy of RMB internationalization determines that the cross-border RMB settlement business inevitably spreads to the whole country.

Unlike the gradual expansion in space of the domestic cross-border RMB settlement pilot areas, the overseas RMB cross-border settlement pilot expanded directly from the “Hong Kong, Macao, and ASEAN” regions to the whole world without any other transition. As the two special administrative regions under the condition of “one country, two systems” in China, Hong Kong and Macau were selected to be the first pilot areas, which is reasonable because of their historical and geological advantages.

As a whole, ASEAN plays an increasingly important role in the regional economy, and it is also the most important cooperation area among Chinese trade partners except the USA. Moreover, there does not exist a strong international currency in ASEAN countries and regions. There also exist certain geographical advantages between ASEAN and China. Therefore, there are special geographical factors and economic reasons that Hong Kong, Macao, and ASEAN were selected in the first group [16].

There are potential possibilities for all countries and regions that have international trade with China to use RMB for cross-border trade settlement. Therefore, to promote RMB internationalization through cross-border trade settlement, it is necessary to practice RMB settlement in cross-border trade around the whole world and explore the possibility that RMB performs international currency functions in a wider space.

It can be seen clearly from Figure 1 that the volume of cross-border RMB settlement was increasing rapidly over the above-mentioned three stages. The accumulated volume of cross-border RMB settlements handled by commercial banks has increased from 3.58 billion Yuan in 2009 to 6.04 trillion Yuan in 2019, an increase of about

TABLE 2: Cross-border RMB settlement or receipt and payment from 2015 to 2021.

Year	Amount	One hundred million Yuan Remarks
2014	6550,000.00	Cross-border RMB settlement
2015	12,100,000.00	Cross-border RMB receipt and payment
2016	9,850,000.00	Cross-border RMB receipt and payment
2017	9,190,000.00	Cross-border RMB receipt and payment
2018	15,850,000.00	Cross-border RMB receipt and payment
2019	19,700,000.00	Cross-border RMB receipt and payment
2020	28,400,000.00	Cross-border RMB receipt and payment
2021	36,600,000.00	Cross-border RMB receipt and payment

Source: <http://www.pbc.gov.cn>, *China Monetary Policy Implementation Report from 2014 to 2021*.

1,687 times. The RMB settlement business of cross-border trade showed an upward trend in volatility from 2009 to 2019.

2.2.3. The Situation of Cross-Border RMB Receipts and Payments. Since 2015, the “Monetary Policy Implementation Report” issued by the People’s Bank of China has transformed the RMB from the original concept of simple cross-border trade RMB settlement to a broader concept of cross-border RMB receipts and payments, covering both the current account and capital account, as shown in Table 2.

2.3. RMB Performs Value Storage Function: The Spatial Evolutionary Characteristics of RMB as an International Reserve Currency. More than 70 central banks or monetary authorities around the world have included RMB in foreign exchange reserves, and RMB was the world’s fifth largest reserve currency in the 1st quarter of 2022 [17] (source: <http://www.imf.org>).

In addition, the number of countries holding RMB as official foreign currency assets has increased so has in amount. According to a survey of 130 member countries conducted by the IMF in 2015, there were 27 countries holding RMB as official foreign currency assets in the world in 2013, and the number has been up to 38 by 2014 [18] (source: <http://www.imf.org>).

The number of RMB assets held worldwide was equivalent to 29 billion special drawing rights (SDR) in 2013, which is about 0.7% of total official foreign currency assets. This number reached 51 billion SDR by 2014, which is equivalent to 1.1% of total official foreign currency assets [19]. By the end of June 2021, overseas entities holding RMB financial assets reach RMB10.26 trillion (source: <http://www.imf.org>).

3. The Motivation Mechanism and Spatial Evolutionary Features of RMB Internationalization

The reasons why the internationalization of the RMB presents such spatial evolutionary features can be summarized in two main aspects: the basic momentum driven by market demand and proactively promoted by national strategies and policies.

3.1. Analysis of the Basic Momentum Driven by Market Demand. In terms of market demand, because of the foundations of China, such as China's total economic volume, international trade level, international investment, and the relative stability of the RMB currency, the demand for RMB for international usage has been increasing in the international markets. The specific manifestations are as follows.

3.1.1. China's Economy. In terms of economic strength, China has achieved world-renowned achievements in economic development since its reform and opening up in 1978. China's GDP was already comparable with Japan and ranked second in the world by 2008. China's total GDP reached \$5,122 billion, following the USA (\$14,418.73 billion) ranked second in the world, and surpassing Japan (\$5,035.140 billion) for the first time in 2009. China officially started a pilot program of RMB settlement for cross-border trade to promote the internationalization of the RMB in July 2009. From the perspective of time, it should not be just a coincidence, but a strategy taken proactively when the country's economic strength reached a certain stage. Since 2009, China's GDP has remained second in the world, and the total amount has further increased. China became the second country in the world to reach 10 trillion US dollars after the USA when China's GDP reached \$10,557.64 billion in 2014. While further narrowing the gap with the USA, the gap in GDP between China and Japan was getting wider. China's GDP was \$13,118.69 billion, a year-on-year increase of 6.1% in 2019. In 2021, China's GDP was USD17,458.04 billion, and it continued to maintain its status as the world's second largest economic capacity (source: <http://www.imf.org>).

3.1.2. China's International Trade. Merchandise import and export trade is China's main body of international trade. From the perspective of total merchandise import and export trade, China's merchandise import and export trade volume broke through the 4 trillion US dollar for the first time in 2013, reaching \$41,589.99 billion. For the first time, China's trade volume surpassed the USA which was \$39,086.53 billion. China became the largest country in

terms of trade volume in commodity imports and export in the world. China's total merchandise import and export trade continued to rank first in the world in 2014 and 2015. China's total merchandise import and export trade continued to maintain a high level, ranking second in the world in 2016. China's total import and export volume was \$4.11 trillion with a year-on-year increase of 11.4% in 2017, \$4.62 trillion with an increase of 12.6% in 2018, \$4.57 trillion in 2019, and USD6.05 trillion in 2021. In general, China's total international trade scale is already the second largest in the world. The huge scale of international trade objectively requires the RMB to become the invoicing and settlement currency in international trade, which helps to avoid foreign exchange rate fluctuations causing exchange losses to the majority of importers and exporters. International trade is becoming one of the main economic factors driving the internationalization of the RMB (source: <http://www.wto.org>).

3.1.3. China's International Investment. Global foreign direct investment outflows declined for the third consecutive year until 2018. According to the statistics of the World Investment Report 2019 of the United Nations Conference on Trade and Development, the global foreign direct investment (FDI) flow was \$1,014.17 billion in 2018, a decrease of 28.9% from the previous year's \$1,425.44 billion. Facing the complex international investment environment, China thoroughly implements new development proposals, fulfilled high-quality development requirements, and increased the effort of policy guidance and public services. China's foreign investment made steady progress in 2021 with an aggregate amount of USD145.19 billion. The global share of FDI stock further increased, and the influence of global FDI has further expanded (source: <http://www.mofcom.gov.cn/>).

China's FDI flow was \$153.71 billion in 2021, taking 1st place in the world. From third place in the world in 2017, it returned to first place which reached the highest value in history (source: <http://www.mofcom.gov.cn/>).

3.2. Actively Propelling through National Strategies and Policies

3.2.1. National Strategies. "Peace, development, cooperation, and win-win" is China's development strategy for a big and powerful country which was proposed in the report of the 18th National Congress of the Communist Party of China. This strategy is an important and scientific ideology for China to actively face the challenges of economic globalization. The most important part of economic globalization is the globalization of finance. In particular, the global financial crisis has obvious international shocks, which indicates that the current international monetary system is overreliance on the US dollar, and the US dollar standard system faces many problems and contradictions. Therefore, the internationalization of the RMB is the key and core to propelling the evolution of the international currency system and constructing a diversified international reserve currency system. It is the joint choice by the international markets and China's development strategy. China's strategy of "peace, development, cooperation, and win-win" is completely different from the

historical rise of colonialism and imperialism relying on aggression and plunder. Instead, it achieves a mutually beneficial and win-win situation between the international society and other countries and regions through the reform of its economic system and economic cooperation.

The internationalization of the RMB has *de facto* become one of the national strategies related to national economic and social development when it was officially written into China's "13th Five-Year Plan." It is an important part and manifestation of the financial development strategy. The process of RMB internationalization should be based on the transformation of China's economy and finance. The internationalization of the RMB will be naturally realized driven by both markets and national strategy when the economic and financial transformation is succeeded, and China becomes a country not only with GDP in scale but also with powerful GDP and strengthened finance. Therefore, as one of the national strategies, the process of internationalization of the RMB is propelled by the government and the market. On the one hand, it is a natural result when the development of China's economy and international trade reaches a certain level. On the other hand, it is undoubtedly the right choice for the current government.

Before the official internationalization of the RMB, the reliance of the RMB on the international monetary system (IMS) exhibits a dependence on the US dollar due to the strong position of the US dollar in the IMS. The RMB has changed into a reformer in the IMS from a follower since the official implementation of the RMB internationalization strategy. This strategic change has already achieved some results; for instance, the RMB has joined the IMF's SDRs currency basket and has begun to appear in the world's official foreign exchange reserves as an independent currency.

In summary, the RMB internationalization strategy is an important part of China's development strategies for a big country and a powerful country. It emphasizes "peace, development, cooperation, and win-win" with other countries and regions, which fulfills both China's national interests and the interests of other countries in the world.

3.2.2. The Belt and Road Initiative and RMB Internationalization. In 2013, Chinese President Xi Jinping successively proposed the cooperation initiatives of the "New Silk Road Economic Belt" and the "21st Century Maritime Silk Road." Using the historical symbols of the ancient Silk Road, this initiative aims to expand the current cooperation in various fields and at various levels, such as political mutual trust, economic trade, and culturally inclusive. This cooperation is referred to as the Belt and Road initiative (Benjamin J Cohen, [6]; Zhang F, Yu M, Yu J, et al. [19]).

The Belt and Road has an obvious linear characteristic in geographical space. Since the initiative is proposed, high-level visits between countries along the route have become more frequent, economic and trade exchanges have been closer, and financial cooperation has been further strengthened (Eichengreen B, [8]). In this process, the usage scope of RMB has expanded in these countries along the route. Various measures have been made, such as projects investment in the "Silk Road Fund", and the establishment of

branches of Chinese banks such that the China union pay cards and ATMs covered more than 50 countries along the route.

SWIFT evaluates the situation of UMB usage in countries along the Belt and Road using the RMB payment amount issued by China from January 2014 to June 2017. Based on these data, it is pointed out that RMB usage in the Belt and Road regions has four characteristics.

First, the amount of RMB usage in commercial payments in the four countries, Kazakhstan, Kyrgyzstan, Tajikistan, and Turkmenistan, shows favorable signs of growth. The absolute amount of paying in RMB is still relatively low compared to countries such as France or Germany; however, China's RMB payments to these countries display a growth rate of higher than 100%.

Second, the RMB business growth prospects in Southeast Asian countries of the "Maritime Silk Road" are favorable. China's RMB commercial payments to Indonesia, Malaysia, Thailand, and Vietnam have increased significantly.

Third, the adoption rate of RMB in other markets of the "Maritime Silk Road" is low. The countries along the "Maritime Silk Road" such as Egypt, Kenya, Greece, and India RMB payments received were lower.

Fourth, the RMB payment situation was more diversified in the Western European markets. China's RMB payments to Germany, Poland, and the Czech Republic have grown strongly, while China's payments to the Netherlands, France, and Italy have fallen sharply.

In general, the usage of RMB in the regions of Belt and Road was concentrated in the main offshore RMB centers by June 2017.

The increase in the layout of offshore RMB centers implies that the internationalization of the RMB presents a "multi-point" spatial distribution status in geographic space, while the Belt and Road has obvious a feature of lines. No matter which features appears, points, or lines, it will eventually provide a possibility of spatial expansion of the RMB internationalization to more areas from points or lines.

3.2.3. Bilateral Local Currency Swap Agreement. From October 2008 to the end of 2009, there were only 6 countries and regions (South Korea, Hong Kong, Malaysia, Indonesia, Belarus, and Argentina) signed bilateral local currency swap agreements with the People's Bank of China, with a total amount of 650 billion Yuan.

The People's Bank of China has signed bilateral local currency swap agreements with central banks or monetary authorities of 39 countries and regions by the end of 2019. It covers most developed and emerging economies around the world, as well as major offshore RMB markets, with a total amount exceeding 3.7 Trillion Yuan.

As the most important portal city to connect mainland of China and the outside world, Hong Kong is the core city of RMB internationalization and the most important RMB offshore market. The currency swaps in Hong Kong increased from 200 billion Yuan in 2009 to 400 billion Yuan/470 billion HKD in 2017.

As one can be seen from Table 3, by the end of July 2017, more than 50 countries and regions have signed bilateral

TABLE 3: Countries and regions which have signed bilateral currency swap agreements with the Central Bank of China from 2008 to 2019.

Year	Countries or regions
2008	Republic of Korea, Hong Kong, China, Malaysia, Indonesia, Belarus, Argentina
2010	Singapore, Iceland
2011	Thailand, New Zealand, People's Republic of Mongolia, Pakistan, Uzbekistan
2012	Australia, the United Arab Emirates, Turkey, Ukraine
2013	Brasil, UK, Hungary, Albania, Central Bank of Europe
2014	Russia, Canada, Argentina, Swiss, Kazakhstan, Sri Lanka, Qatar
2015	South Africa, Surinam, Armenia, Chile, Tajikistan
2016	Morocco, Egypt
2018	Japan
2019	Macao China
2020	Laos

currency swap agreements with China. From the geographic point of view, the number of bilateral currency swap agreements exhibits a trend of further expansion.

Since 2009, the countries and regions that have signed bilateral currency swap agreements with China have not only increased rapidly in number, from 6 in 2009 to 52 in early 2020, but also covered Europe, Asia, Africa, South America, Oceania, and North America. The geographic spatial distribution of countries and regions that have signed agreements with China shows an uneven feature of growth. This uneven feature is demonstrated most significantly when we compare North America, Oceania, and Africa.

3.2.4. RMB Offshore Financial Center. China has established 26 RMB clearing banks in 24 countries and regions outside of China by June 2020, covering Asia, America, Europe, Oceania, and Africa, for the foreign entities' convenience holding and using RMB. Except for JPMorgan Chase Bank in the USA and Mitsubishi UFJ Bank in Japan, these RMB clearing banks are all held by major Chinese banks (see Table 4 for details).

These RMB clearing banks facilitate offshore RMB transactions and cross-border RMB payments.

At present, the most important five *points* are Hong Kong, China, the UK, Russian Federation, Singapore, and the USA. The offshore RMB market share of the 5 offshore centers accounts for about 87.93 percent of the global offshore RMB market share. China has designated 24 offshore RMB financial centers scattered around the world by 2021, and it will be possible to spread the international usage of RMB to the "areas" involved in these "points." The Belt and Road initiative has continuously strengthened the use of RMB in financial investment and financial services in countries along the route, which plays a role in the expansion of RMB internationalization from "points" to "areas" (source: <http://www.swift.com>).

As the world's largest and most efficient offshore RMB center, Hong Kong has always played an important role in the process of RMB internationalization since its offshore RMB business started in 2004. The RMB business maintains rapid growth or above a high level in Hong Kong. It plays an important role in various fields such as RMB deposits, RMB settlement in cross-border trade, RMB direct investment, RMB investment in financial markets, and RMB international bond issuance. In July 2022, Hong Kong still takes the 1st place of offshore RMB businesses with a share of 70.93% (source: <http://www.swift.com>).

London is the first offshore RMB center outside Asia that can carry out RMB clearing business. It is the second largest RMB offshore clearing center. Its market share of offshore RMB business accounts for 6.35% of the global share in July 2022. It plays an important role in expanding the usage of RMB overseas and accelerating the process of RMB internationalization (source: <http://www.swift.com>).

The offshore financial center in Russian Federation allows its qualified institutional investors to enter China's security markets and make RMB offshore investments. It also allows qualified institutional investors from Mainland China to invest in Russian capital markets using RMB. The usage scope of RMB has been further expanded through the Russian offshore financial center. The share of offshore RMB business accounts for 3.90% of the global share in July 2022 which takes the 3rd place in all the offshore RMB centers (source: <http://www.swift.com>).

3.3. Adjustment of International Political and Economic Relations and Opportunities for Reform of the International Monetary System. The world economy has shown a development trend from "one super" to "one super, multiple powers" since World War II. Regional economic integration and global economic integration have been further strengthened.

From the period after World War II to the early 1970s, the USA occupied a dominant position in the world economy, with strong industrial strength and abundant gold reserves. It controlled the international financial market and world markets of commodity and trade services by establishing and controlling the Bretton Woods system and the General Agreement on Tariffs and Trade.

The USA also implemented the "Marshall Plan" during this period to help Western European countries revive from the damages of war. From the 1970s to the late 1980s, the unbalanced economic development of capitalist countries still existed. The European Community and Japan made great progress in many economic fields, and then, the capitalist world presented a three-polar situation of the USA, the European Community, and Japan.

Since the 1990s, the degree of the economic interdependence of countries has further deepened, and the trend of world economic regional clustering and global economic integration has continued to strengthen, with a further strengthening of production and division of labor and the huge impact of the new technological revolution. At this stage, the process of European economic integration has accelerated; ASEAN regional cooperation has been further

TABLE 4: Offshore RMB clearing center and clearing banks.

Item	Cities	Clearing bank	Start time	Belongs to
1	Hong Kong China	Bank of China	Dec. 2003	Asia
2	Macao, China	Bank of China	Sep. 2004	Asia
3	Vientiane, Laos	Industrial and Commercial Bank of China	Jun. 2012	Asia
4	Taiwan, China	Bank of China	Dec. 2012	Asia
5	Singapore	Industrial and Commercial Bank of China	Feb. 2013	Asia
6	Phnom Penh, Cambodia	Industrial and Commercial Bank of China	Mar. 2014	Asia
7	London, UK	China Construction Bank	Jun. 2014	Europe
8	Frankfurt, Germany	Bank of China	Jun. 2014	Europe
9	Seoul, Korea	Bank of Communications	Jul. 2014	Asia
10	Paris, France	Bank of China	Sep. 2014	Europe
11	Luxembourg	Industrial and Commercial Bank of China	Sep. 2014	Europe
12	Doha, Qatar	Industrial and Commercial Bank of China	Nov. 2014	Asia
13	Toronto, Canada	Industrial and Commercial Bank of China	Nov. 2014	North America
14	Kuala Lumpur, Malaysia	Bank of China	Jan. 2015	Asia
15	Bangkok, Thailand	Industrial and Commercial Bank of China	Jan. 2015	Asia
16	Sydney, Australia	Bank of China	Feb. 2015	Oceania
17	Santiago, Chile	China Construction Bank	May. 2015	South America
18	Budapest, Hungary	Bank of China	Jun. 2015	Europe
19	Johannesburg, South Africa	Bank of China	Jul. 2015	Africa
20	Argentina	Industrial and Commercial Bank of China	Sep. 2015	South America
21	Lusaka, Zambia	Bank of China	Sep. 2015	Africa
22	Zurich, Switzerland	China Construction Bank	Nov. 2015	Europe
23	New York, USA	Bank of China	Sep. 2016	North America
24	New York, USA	JP Morgan Chase Bank	Feb. 2018	North America
25	Tokyo, Japan	Bank of China	Oct. 2018	Asia
26	Tokyo, Japan	Mitsubishi UFJ Bank	Jun. 2019	Asia

Source: according to public information.

strengthened; China's economy has risen and become an important role in the world economy; and Japan remains the third largest economy in the world.

Neoliberalism quickly became popular and gradually formed an international financial system with the collapse of the Bretton Woods system in 1973. The Washington Consensus was formed in 1990. Global economic integration and economic financialization were rapidly developed, and financial centers rapidly evolved and formed networks (CFCI, 2019).

The adjustment and evolution of international political and economic relations inevitably brought about the adjustment of the international multipolar political and economic structure. The currency is a manifestation of the political and economic strength of a country or region. Therefore, the opportunity for diversified adjustment of the international politics and economy provided an opportunity for China to adjust its international position and the internationalization of the RMB.

The subprime mortgage crisis originated in the USA and brought financial turmoil that hit the world in 2008. This financial crisis further highlighted the shortcomings of the US dollar standard in the international monetary system.

The European Union and Russia also advocate reforms to the international monetary system, although they have different concerns. This requirement proposed by major economic entities and regions in the world has caused the reform of the international monetary system to develop from theoretical discussions to practical policies.

The Chinese Ministry of Finance issued 3 billion offshore RMB bonds in London in May 2016, which accelerated the internationalization of the RMB. The overseas investment by Chinese companies has greatly increased since China joined the WTO. China's industry-wide FDI reached US\$117.12 billion in 2019. By the end of 2021, the number of investors outside China who hold RMB bonds reached 4 trillion. China participates in the global economy and promotes the internationalization of the RMB (Source: <https://www.bbtnews.com.cn/>).

The RMB officially joined the SDR (Special Drawing Rights) currency basket on October 1, 2016, with a share of 10.92%. After continuous efforts, which created a new situation in the international monetary system, that is, as the currency of a developing country, the RMB joined the international monetary system first, which provides new possibilities for countries to choose more diversified reserve currencies, trade settlement currencies, and payment

currencies in the international monetary system. On August 1, 2022, RMB's share in the SDR currency basket rises to 12.28% (source: <http://www.imf.org>).

3.4. The Rational Choice of the Geographic Status Quos of Asian Currencies. Currently, there are huge differences in various political situations such as social systems, political systems, and state formation among Asian countries. It does not meet Mundell's criteria of "the optimum currency area" which is only suitable for areas that are continuously integrated with politics. In other words, the term "Asian Dollar" proposed in academics does not work in terms of political integration. At present, the vast majority of Asian countries are still issuing and circulating their currencies in their respective territories. However, due to historical, political, economic, and other reasons, some Asian countries and regions have shown other different characteristics in currency geography, which are prominently shown in the following three aspects:

First, multiple currencies are issued and circulated within the territory of a country. For instance, there exist four currencies in China issued in Mainland, Hong Kong, Macao, and Taiwan.

Second, a currency with a higher degree of internationalization is adopted as the local currency. For example, Cyprus has joined the Eurozone and fully adopts the Euro as its domestic currency; East Timor adopts the US dollar as its domestic currency; and the country only issues coins as fractional currency, which is equivalent to the US dollar in value.

Third, there are no currencies issued but two currencies circulating in the country at the same time. For instance, Palestine does not yet have its currency, and both Israeli currency (shekel) and Jordanian currency (dinar) are circulated in the country.

The concept of the "Asian Dollar" can only stay at the stage of conception. McKinnon (2004) has been aware of this issue. He said, "At present, the political will for full-scale economic and monetary integration with neighboring countries simply does not exist elsewhere. However, a less politically demanding common monetary standard based on a key currency might achieve much – although certainly not all – of the benefits of a common currency." This argument still applies to the current situation in Asia. In other words, the "Asian Dollar" does not apply to Asia at the moment. Regarding the RMB as a key currency, firmly propelling the internationalization of the RMB is another way to realize the internationalization of the RMB. It also meets the McKinnon criteria of "a less politically demanding common monetary standard based on a key currency."

McKinnon further pointed out that a successful common monetary standard requires two key interrelated conditions:

- (1) A credible anchoring mechanism so that countries that attach themselves to the standard succeed in stabilizing the purchasing powers of their national monies
- (2) Close trading partners who attach themselves convincingly to the same standard

With the continuous strengthening of China's economy, the RMB has joined the IMF's currency basket and has con-

tinued to rise in the rankings of international payment currencies. The status of the RMB in the international currency system is continuously improving. The credit anchoring mechanism with RMB as the key currency might be mature. It is more realistic and feasible to steadily promote the internationalization of the RMB than the assumptions of the "Asian Dollar" or "China Dollar."

4. Conclusions and Outlook

We analyzed the spatial evolutionary characteristics of RMB internationalization and further explained the mechanism of the spatial evolutionary structure of RMB internationalization from the perspective of domestic and foreign motivations.

The main findings are as follows:

Firstly, the RMB has evolved from the pure simple RMB settlement in cross-border trade to a broader concept of cross-border RMB payment since the official launch of RMB internationalization in 2009, which covered both the current account and capital account.

Secondly, the spatial evolutionary path of RMB internationalization presents a certain spatiotemporal pattern. It initially expanded to East Asian countries and regions, gradually expanded to developing countries in Southeast Asia, and then advanced to developed countries in Europe, South America, and Australia and participating countries along the Belt and Road.

Thirdly, the RMB settlement of cross-border trade presents the "coast-border-inland" spatial characteristics.

Fourthly, bilateral currency swaps show "rapid growth" and "unbalanced growth."

Fifthly, the spatial structure of RMB internationalization has obvious characteristics of "from points to areas, and from lines to areas" because of the impetus from the RMB offshore financial centers, RMB clearing banks, and the Belt and Road initiative. The "points" mainly refer to the spatial characteristics of RMB offshore financial centers, and the "lines" mainly refer to the linear characteristics of the Belt and Road.

Sixthly, China's economic strength is still the decisive factor in the internationalization of the RMB, and import and export trade volume and foreign investment are important driving forces.

Looking into the future, the role of the RMB as an international payment currency, foreign exchange reserve currency, and trade settlement currency will be further strengthened. The RMB will inevitably perform various functions of an international currency in a broader geographic space in the future. However, the strong position of the US dollar and the Euro in the existing international monetary system remains, and the historical advantages of the British pound and the Japanese yen still exist. The currency competition faced by the internationalization of the RMB is mainly the above four international currencies. However, from the absolute amount and proportion perspective, the difference between the RMB, as a foreign exchange reserve currency, and international payment currency, the British pound, and the Japanese yen is not too

big. As China's economic strength, international trade, and foreign investment are continuously enhanced, it is hopefully expected that the RMB will surpass the British pound and the Japanese yen in a near future. The position of the RMB in the international monetary system will be further enhanced, too.

Data Availability

The data on the Renminbi ranking and proportion are obtained from the official website of SWIFT. Other data regarding RMB cross-border receipt and payment are obtained from the official website of the People's Bank of China. All the data are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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