Exploring the Positive Impact of the "Belt and Road" Initiative on RMB Internationalization based on RII Index

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Abstract

Since the official launch of RMB cross-border trade settlement in July 2009, RMB internationalization has been steadily promoted by market demand and RMB internationalization strategy. The main content of the "One Belt, One Road" construction. By exporting the RMB from the capital account, China has achieved a continuous net export of capital, which is an important guarantee for the RMB's "going out". At the same time, China has actively signed bilateral currency swap agreements with countries along the Belt and Road, proposed RMB clearing mechanism arrangements, and actively promoted the RMB nationalization agenda. Based on the "one belt one road" initiative, this paper will review the literature on the current and future development of RMB internationalization from the perspectives of both present and future. First, this paper will use VOSviewer to conduct a keyword covariance analysis of the literature, which shows that "RMB internationalization" is a key node with good centrality. The nodes are related to ADB, one belt one road, one belt one road, currency anchor, exchange rate volatility, savr model, foreign direct investment, capital account opening, etc. The key nodes are "RMB internationalization" and "one belt and one road", and the evidence types include financial innovation, opportunities, RMB regionalization, OFDI, and ADB. Then, the author summarizes the measurement method of RMB internationalization index, and summarizes the three-level indicator construction, indicator weighting to establish the construction system method. Based on the RII data, the development trend of RMB internationalization is pointed out. Finally, based on the above literature review, this paper proposes recommendations to accelerate the internationalization of the RMB and proposes three major goals for the current, medium, and long term.

Keywords

"One Belt One Road" Initiative; RMB Internationalization; Vosviewer; RMB Internationalization Index; RII.

1. Introduction

Since the official opening of RMB cross-border trade settlement in July 2009, RMB internationalization has been steadily promoted by market demand and RMB internationalization strategy. According to the Renminbi Internationalization Report 2021,[1] in 2020, the total amount of RMB cross-border payments and receipts will be 28.39 trillion yuan, with a 40.8% year-on-year growth rate; RMB 14.29 trillion yuan was paid, with a 48.0% year-on-year growth rate. The ratio of receipt to payment stands at 1:1.01, and a net outflow of RMB 185.786 billion yuan, compared with a net inflow of RMB 360.528 billion yuan in the same period of the previous year, showing a trend of RMB outflow from the country. RMB cross-border receipts and payments accounted for 46.2% of total domestic and foreign currency cross-border receipts and payments in the same period, a record high and 8% higher than in 2019. in the first six months of 2021, RMB cross-border receipts and payments amounted to RMB17.57 trillion, 48.2% of total domestic and foreign currency cross-border receipts and payments in the same period and 2.4% higher than in the same period last year.

(Trillion)
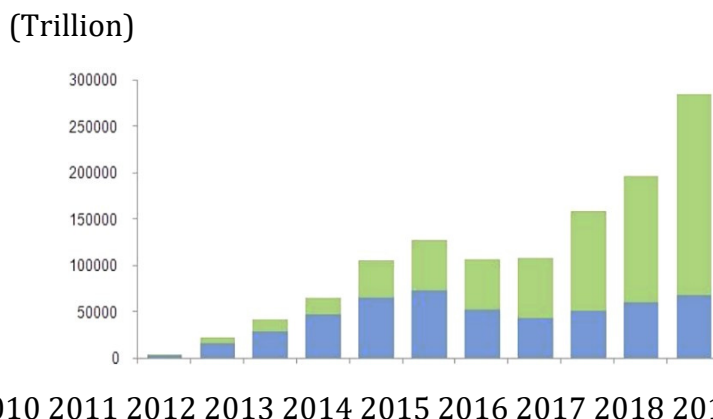
Fig 1. Annual RMB Cross-border Receipts and Payments 2010-2020
Data source: People's Bank of China

In 2015, the "One Belt, One Road" strategic deployment was proposed, [2] with common development as the fundamental attribute, equality and mutual benefit as the principle, and pragmatic cooperation as the orientation. [3] The main content is the construction of five links, namely policy communication, infrastructure interconnection, investment and trade cooperation, financial integration and people-to-people contact. Among them, investment and trade cooperation, to achieve financial integration is the main content of the "Belt and Road" construction. China has been able to achieve this through the export of RMB from the capital account is an important guarantee for the "going out" of RMB. At the same time, China is actively promoting the RMB nationalization agenda by signing bilateral currency swap agreements with countries along the Belt and Road, and proposing RMB clearing mechanism arrangements.

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[1] In 2020, the amount of RMB cross-border receipts and payments between China and countries along the "Belt and Road" exceeded RMB 4.53 trillion, up 65.9% year-on-year, accounting for 16.0% of the total RMB cross-border receipts and payments in the same period. Among them, the amount of goods trade receipts and payments is 870.97 billion yuan, up 18.8% year-on-year, and the amount of direct investment receipts and payments is 434.116 billion yuan, up 72.0% year-on-year. At the end of the year, China signed bilateral local currency swap agreements with 22 countries along the Belt and Road, and established RMB clearing mechanism arrangements in 8 countries along the Belt and Road.

This shows that the "Belt and Road" construction provides a wider and more convenient opportunity for the regional use and global promotion of the RMB, expanding the demand for the RMB through the construction of the Five Links, helping to accelerate currency circulation, reduce transaction costs, and avoid financial risks, which is an important driving force for the internationalization of the RMB. Figure 2 shows the impact of the "Belt and Road" initiative on the RMB.

Then, based on the perspective of "One Belt, One Road" initiative, this paper will conduct a literature review on the development of RMB internationalization from two perspectives: present and future. First, this paper will use VOSviewer to conduct a keyword covariance analysis to explore the research hotspots in the field of RMB internationalization from the dimensions of time and space, and continue to focus on "One Belt, One Road and RMB internationalization" for in-depth analysis. Then, I summarize the measurement method of RMB internationalization index, and point out the development trend of RMB internationalization

through RII data, and analyze the positive impact of "One Belt, One Road" initiative on RMB internationalization through the results. Finally, the paper gives suggestions on the countermeasures for the RMB to become a world currency, considering the review in the paper.
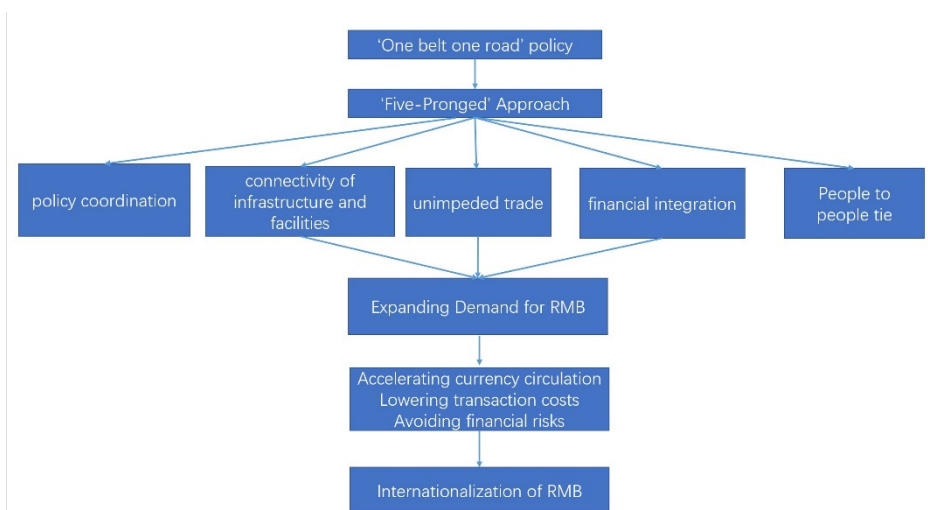
**Fig 2.** The role of the "Belt and Road" initiative in promoting the internationalization of the RMB

2. VOSviewer-based: Keyword Co-occurrence Analysis of the Literature

The core idea behind the design of VOSviewer software is "co-occurrence clustering", which means that two things appearing at the same time means they are related; there are multiple types of such relationships, and they differ in strength and direction; clustering based on measures of relationship strength and direction allows finding different types of groups. The software provides three visualization views: network visualization, overlay visualization, and density visualization.

Based on VOSviewer, we searched 500 cssci and Peking University core journals on the topic of "RMB internationalization" and conducted keyword covariance analysis to explore the research hotspots in the literature. Then, this paper focuses on the hot topic of "One Belt, One Road and RMB Internationalization" for subsequent literature analysis, to explore the hot spots in this field and explore the potential of the industry research field.

The key words can reflect the core of the literature, and the key word clustering analysis presents the research focus of this field. The results of the cluster analysis show that "RMB internationalization" is a key node with good centrality, and the nodes involved are: ADB, Belt and Road, currency anchor, exchange rate fluctuation, savr model, foreign direct investment, capital account opening, etc. The specific results are shown in Figure 4 and Figure 5.

Meanwhile, 65 core journals of web of science with "internationalization of RMB" as the keyword were exported for co-linear analysis. As shown in Fig. 6, the research hotspots in this field show a migration trend over time. VOSviewer software was used to import the keywords to create a visual temporal knowledge map, and the darker the clusters, the earlier the year of publication. The keywords of core journals migrated from macro 'Chinese government' to 'exchange rate', and then to 'road initiative ' & 'belt'.
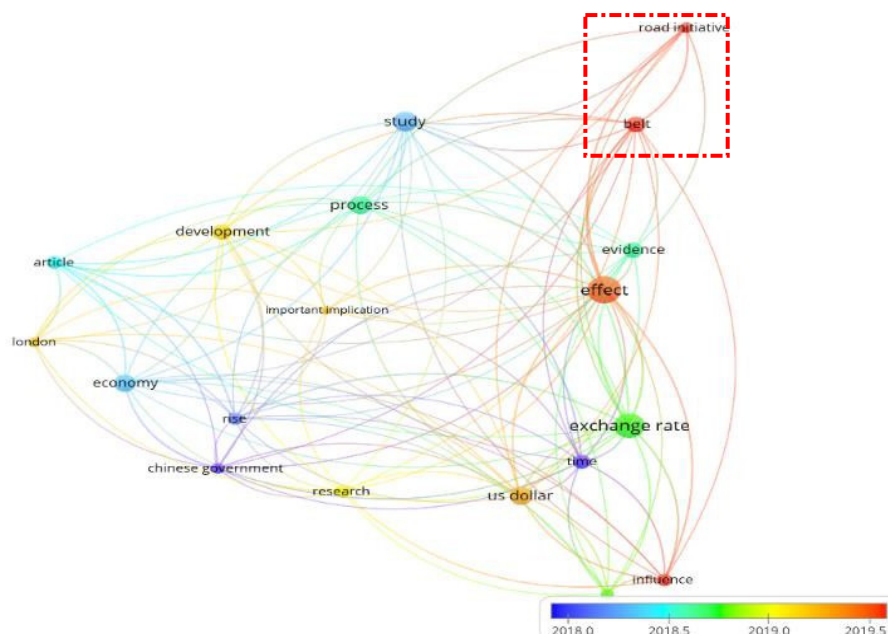
Fig 3. Overlay visualization based on WOS core essays

As shown in Figures 4 and 5, the "Belt and Road" initiative has a high weight in the topic of RMB internationalization; as shown in Figure 6, the research hotspots have moved more towards the Belt and Road over time. This proves that the "Belt and Road" initiative led by [3], which spans a wide range of countries in Asia, Europe and Africa, has become an important platform to promote RMB internationalization.

Then, this paper searched 428 cssci and Peking University core journals with "Belt and Road" and "RMB internationalization" as keywords and conducted keyword co-occurrence analysis. The results of the cluster analysis show that "RMB internationalization" and "Belt and Road" are key nodes with good centrality, involving financial innovation, opportunities, RMB regionalization, opening, foreign direct investment, Shanghai Free Trade Zone, ADB, infrastructure.

3. Based on RII: The Positive Impact of Belt and Road on RMB Internationalization

3.1. Literature Review

The international community usually uses the share of currencies in official foreign exchange reserves to measure the level of currency internationalization, and this indicator is published by the IMF. Since the IMF only counts and publishes the currencies with a share of more than 1% of the world's official foreign exchange reserves, the only currencies that meet this condition are the US dollar, the euro, the Japanese yen, the British pound, and the Swiss franc. In other words, it is impossible to measure the internationalization level of the RMB using the internationally accepted indicator of the share of the currency in official foreign exchange reserves. In order to solve this problem and accurately grasp the process of RMB internationalization, domestic scholars have conducted in-depth studies and tried to evaluate the objective phenomenon of RMB exercising its world currency function from different perspectives.

The domestic literature on the measurement of RMB internationalization is relatively small and mainly divided into two aspects: firstly, it is an econometric analysis of the influencing factors of RMB internationalization, represented by Li Daokui and Liu Linlin (2008); secondly, it is a

comprehensive evaluation type model for RMB internationalization level, and the index of RMB internationalization is derived by weighting the indicators, represented by Wei Hao, Dai Jinping, Jin Xiaoting (2010), Zhang Yingmei (2013), and Tu Yonghong (2013).

Li, Daokui and Liu, Linlin (2008) [4] analyzed the international reserves of central banks, trade settlements, and the share of national currencies in international bonds to explore the intrinsic factors affecting the internationalization of a country's currency. Based on the study of Chinn and Frankel (2005), the internationalization of RMB is measured in terms of the value reserve, medium of exchange and unit of measure of international currency, but no comprehensive index is given to measure the internationalization of RMB. Wei Hao, Dai Jinping, Jin Xiaoting (2010) [5] An innovative approach to constructing five single indicators (social practices, economic size, financial sophistication, monetary and financial stability, and network externalities) and one composite indicator to measure currency internationalization.

The system of indicators, which empirically analyzes the evolution of the internationalization of five currencies: the US dollar, the euro, the German mark, the Japanese yen and the British pound, suggests that the current two-tier pattern is that the euro and the US dollar dominate international currencies, followed by the British pound and the Japanese yen. However, the constructed indicators do not fully cover the three major functions of currencies.

Zhang Yingmei (2013) [6] combined 19 relevant economic indicators to describe the extent to which the RMB performs the functions of international currency value reserve, medium of exchange and value measure.

By analyzing the quarterly data from 2001 to 2010 through MATLAB principal component analysis, a comprehensive index to measure the internationalization of RMB is established and the issue of measuring the internationalization of RMB is investigated. Compared with the existing studies, this paper is more practical in terms of the weighting of indicators. This paper is more precise in the treatment of indicator weights. However, the selection of indicators is numerous, the weights will change with the factors, the compositeness is poor, and the data availability is relatively weak.

Tu Y. H. (2013) [7] established the RMB internationalization index (RII, RMB internationalization index), which has been used as a simple and effective management tool until now. Compared with the measurement method of Zhang Yingmei (2013), this index emphasizes more on the currency denomination and transaction function in the real economy, and is a new indicator to measure and reflect the real level of RMB internationalization. It has the following three advantages: first, the internationalization index of the currency integrally reflects the three major functions of the international currency: the measure of value, the means of circulation, and the means of storage; second, the internationalization index of the currency emphasizes the real economy transaction function of the currency, and the international denomination and transaction functions of the currency are given equal weights to the official reserve function respectively in the construction of the index, which is in line with the current international financial Secondly, the internationalization index emphasizes the real economy transaction function of currencies, and gives equal weight to the international valuation and transaction functions and the official reserve function respectively, which is in line with the current trend of international financial "deleveraging" and returning from the virtual economy to the real economy, and is more scientific and reasonable.

3.2. Model Construction

First, the indicator construction is based on the three major functions of RMB. [7] Considering that in international trade, the value measure function and the means of payment function are combined into one, that is, the valuation and payment function. Therefore, the primary indicators of RMB internationalization index mainly include international valuation and payment function and international reserve function, and the international valuation and

payment function can be reflected in trade and finance, therefore, in the internationalization index, trade valuation, financial valuation and official foreign exchange reserve function are parallel, and the weight of each of them is 1/3.

Table 1. Construction of RII index (data source: Tu yong hong (2013) [7]

Index I	Index II	indexIII
International Billing Payment Function	trade	Share of RMB settlement in total world trade
		Share of RMB in global total external credit
	finance	Share of RMB bonds and notes in global international bond and note issuance
		Share of RMB bonds and notes in global international bond and note balances
International reserve function	Official reserves of foreign exchanges	Share of RMB direct investment in global direct investment
		Share of RMB reserves in global foreign exchange reserves

Note: Share of RMB settlement in total world trade = RMB cross-border

issuance = RMB international bond and note issuance / global international bond and note issuance

Share of RMB bonds and notes in global international bond and note balances = RMB international bond and note balances/global international bond and note balances

Share of RMB direct investment in global direct investment = RMB direct investment volume / global direct investment volume

Share of RMB reserves in global foreign exchange reserves = RMB official reserve balance / global foreign exchange reserve

In terms of the construction of indicator weights w, Luqi Cao and Wei Dai (2021) [8] proposed that the weights of the corresponding indicators can be calculated separately using the entropy weight method and the coefficient of variation method, and then the final weights of each indicator can be calculated by combining them according to the CRTIC objective assignment method of evaluation indicators, without going into the specific calculation process. Finally, the indexes and weights are substituted into the formula (1) for calculation. each index in the index system of RII is a weight itself, and there is no order of magnitude difference, so there is no need for dimensionless processing, and it can be directly weighted average and compiled RII.

$$RII_t = \frac{\sum_{j=1}^{5} x_{jt} w_j}{\sum_{j=1}^{5} w_j} \times 100 \tag{1}$$
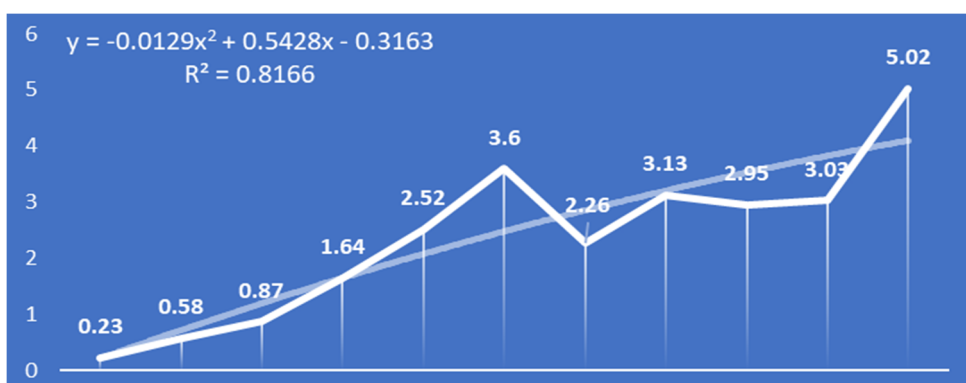
RII_t denotes the RMB internationalization index at period t (t=1, 2, 3, 4); x_{jt} denotes the value of indicator j at period t; w_j denotes the weight of indicator j., w_j denotes the value of the jth indicator in the tth period, and w_j denotes the weight of the jth indicator.

3.3.   Presentation of the Result

Table 2 presents the trend of the RMB RII index for the four quarters of 2010-2020. Figure 8 Intercept 2010-2020.RII data for the fourth quarter of the year, plotted as a line graph.

Table 2. 2010-2020 RMB RII index

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Q1	0.02	0.26	0.55	0.95	2.30	2.48	2.65	1.49	3.24	2.63	/
Q2	0.04	0.41	0.70	1.11	2.36	2.76	3.03	1.82	3.13	3.80	/
Q3	0.10	0.44	0.77	1.14	2.10	3.87	2.78	1.90	2.89	3.23	/
Q4	0.23	0.58	0.87	1.64	2.52	3.60	2.26	3.13	2.95	3.03	5.02

Fig 4. Trend of RII index between 2010-2020

As shown in Figure 8, the RMB internationalization index can be divided into five stages: the budding stage (2009-2012), the surging stage (2013-2015), the fluctuating stage (2016-2017), the stabilizing stage (2018-2019), and the soaring stage (2020-). The orderly advancement of the "Belt and Road" strategy played an indelible role in the surge phase (2013-2015). During the surge phase, China's RII climbed from 0.95 in the first quarter of 2013 to 3.60 in the fourth quarter of 2015, and the driving mode of RII has changed to one in which both trade and financial transactions are driven in parallel, with the significant growth of RMB direct investment and overseas loans being the most important factors driving the high growth of RII. As shown in Figure 9, the currency swap agreements signed between China and countries along the Belt and Road have also contributed to the rise in the RII index.

Cross-border RMB use facilitation has been increasing, capital account convertibility has made outstanding progress, and offshore RMB The "One Belt, One Road" initiative provides a broad platform for the use of RMB in practice.

[10] On November 30, 2015, the International Monetary Fund announced the inclusion of the RMB in the SDR currency basket, and the new currency basket. The RMB weighting of 10.92% as determined by the Sub will take effect on October 1, 2016. This is an important milestone in the integration of the Chinese economy into the global financial system and is a win-win outcome for both the world and China. From 2019 to 2020, the RMB internationalization index enters a take-off phase. By the end of 2020, China and 22Bilateral local currency swap agreements have been signed by eight countries along the Belt and Road, and RMB clearing mechanism arrangements have been established in eight countries along the Belt and Road. In recent years, China has deepened its economic and trade cooperation with ASEAN. As the number one trading partner of most ASEAN countries and an important source of investment, China's total imports and exports to ASEAN grew by 7.0% year-on-year in 2020, making ASEAN our number one trading partner, which undoubtedly contributed to the improvement of the RMB index.

4. Conclusion

From VOS viewer's keyword analysis, we can see that the "Belt and Road" initiative is a hot topic in RMB internationalization, and researchers tend to focus on financial innovation, financial innovation, opportunities, RMB regionalization, opening, foreign direct investment, Shanghai FTZ, ADB, and infrastructure. This is theoretical evidence that researchers believe that the Belt and Road Initiative has great potential to drive up the RMB internationalization index.

From the 2010-2020 RMB RII Index, we can see that the development of the RMB internationalization index over the decade, even though fluctuating in three years due to the complex international situation (e.g., the proposed de-globalization in 2015-1017), still shows an increasing trend, which is in line with the "One Belt, One Road" to increase cross-border trade settlement, the signing of currency swap agreements, and the construction of the Five Links. This is inextricably linked to the increased cross-border trade settlements, currency swap agreements, and the construction of the Five Links in the Belt and Road. This empirically proves that researchers believe that the Belt and Road Initiative has contributed to the rise of the RMB internationalization index.

Based on the above results and combined with the proposals in the core literature, the author proposes three major objectives for the "Belt and Road" initiative to enhance the internationalization index of RMB: The current objective is to regionalize the RMB and increase RMB cross-border trade settlement, i.e., to actively establish RMB clearing banks and carry out bilateral currency swap agreements. The medium-term goal is to promote the internationalization of the RMB in the form of a free trade zone; the long-term goal is to consolidate the foundation of the "Five Links" and move towards a major international currency, and with the east wind of the "Five Links", to enhance the investment and financing of the "Belt and Road" countries by financial institutions such as the Asian Investment Bank and the Silk Road Fund. "The country can also export RMB from capital projects to achieve a continuous net export of capital. In addition to traditional trade, the country can also adapt to the requirements of trade diversification and expand the use of RMB in new trade modes such as cross-border e-commerce and market procurement.

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