

The Impact of Cross-Border Transactions on the Internationalization of Yuan: Evidence from January 2012 to February 2022

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Abstract: Since the reform and open to the outside world, China's cross-border transactions have been deepening. In this situation, it is imperative to study the impact of cross-border transactions on the process of RMB internationalization. This paper takes the data of the past ten years as the main reference object and discusses it in three steps in order to promote the benign process of RMB internationalization. Firstly, it summarizes the current research status of cross-border RMB internationalization; secondly, it analyzes the current status of cross-border RMB settlement and the impact of cross-border transactions on the process of RMB internationalization; finally, it puts forward policy suggestions on cross-border transactions to promote the process of RMB internationalization.

Keywords: cross-border transaction; CNY; The internationalization of RMB; RMB settlement

1. Introduction

With China has continuously increased its communication with other countries, and the exchange in culture, politics, especially in economy and trade has become more frequent. In the first half of 2022 alone, China's cross-border transaction volume reached nearly 20 trillion yuan, once again securing its position as the first in the world. China's cross-border transactions, from 0 before the opening up, become the world's first in 2012. Although China's cross-border transactions by leaps and bounds, and between countries in the world is gradually close, but in cross-border transactions more than 90% need to be completed through the international currency. In this case, in the process of cross-border transactions, Chinese enterprises and overseas enterprises need to transit currency through the third-party bank. When exchange rate transfer is carried out, on the one hand, exchange rate transfer needs a period of time to realize the liquidation of funds, which will affect the operation of the normal cash flow of enterprises and is not conducive to the development of enterprises. On the other hand, some processes in the transfer process also need to charge fees, which further increases the operating costs of enterprises and shortens the limited profits of enterprises. What's worse, the use of international currencies in cross-border transactions can also cause Chinese enterprises to be affected by changes in international exchange rates, thus greatly increasing systemic risks. In this context, the internationalization of RMB is what the Chinese people are eager to achieve. At present, scholars have not formed a complete system in the process of studying cross-border transactions and RMB internationalization, focusing on the theoretical level, and the data analysis of the impact of cross-border transactions and RMB internationalization process lacks real-time updates. So, it is of great significance to study the influence of cross-border transactions on the internationalization of RMB.

2. Literature Review

With the increasing maturity and opening of our financial market, there are so many voices about the use of RMB in cross-border settlement. Since the pilot RMB cross-border settlement was officially launched in 2009, the RMB cross-border trade settlement has developed rapidly under the unfavorable environment of the global financial crisis. Based on the current situation, the internationalization of RMB has been widely expected. Scholar Ba Shusong [6] believes that although the smooth development of RMB cross-border settlement represents the first step of RMB internationalization, the road of RMB internationalization is still far away. Only after RMB becomes a common international trade settlement currency, it may gradually become an investment and reserve currency. It can be seen that RMB road

settlement plays an important role in promoting the internationalization of RMB. The rapid development of RMB cross-border settlement not only reflects the needs of China's current financial development, but also is the only way for China to realize an open economy and realize the internationalization of RMB.

2.1. Literature Review at the Theoretical Level

On the theoretical level, as for the prospect of cross-border RMB transactions, scholar Li Bo[1], through a series of theoretical analysis, concluded that there is a good development scenario of China's cross-border RMB transactions, but there are still some difficulties in the development of RMB internationalization at the micro and macro levels. It is necessary to develop RMB financial products outside China and improve the efficiency of cross-border RMB clearing, so as to further improve the service measures for Chinese people in cross-border transactions. As for the risks of cross-border RMB transactions, scholar Li Jun[2] believes that China's cross-border transaction of RMB may have the risk of foam caused by the acceleration of capital flow and the risk of macro policy regulation under the pressure of internal capital. As for the path of cross-border RMB transactions, scholar Xu Qingwei [3] believes that it is urgent to promote the internationalization process of RMB by further establishing a close degree with foreign industries, further opening cross-border exchanges, providing preferential policies and taking advantage of opportunities of national assistance.

2.2. Empirical Literature Review

At the empirical level, regarding the impact of cross-border RMB internationalization on the balance of payments management, scholar Ye Yafei [4] established the SVAR model and concluded that the internationalization of cross-border RMB would increase the pressure on foreign exchange reserves in the short term, but in the long run, it would help relieve the pressure on balance of payments management. As for the impact of cross-border RMB internationalization on currency supply, scholar Tao Shigui [5] conducted a series of empirical analysis through the introduction estimation method and found that the internationalization of cross-border RMB has no significant impact on money supply at present.

2.3. Summary of Literature Review

At present, there are few researches on the impact of cross-border transactions and RMB internationalization, at the same time, scholars have not formed a complete system in the process of studying cross-border transactions and RMB internationalization, focusing on the theoretical level, and the data analysis of the impact of cross-border transactions and RMB internationalization process lacks real-time updates. So, it is of great significance to study the influence of cross-border transactions on the internationalization of RMB.

3. Analysis of the Status Quo of Cross-border RMB Settlement

With the accelerated process of opening up to the outside world, the trade with other countries becomes more and more frequent. As can be seen from Table 1, from 2012 to 2021, the total value of China's import and export (IEV) increased year by year, from US \$3, 867. 52 billion to US \$6, 047. 1 billion, ranking the first in the world, with an increase of 56. 36%. At the moment, as China continues to expand the pilot of cross-border trade settlement in RMB, from 5 cities in 2009 to 20 provinces today, the amount of cross-border trade settlement in RMB has also increased from 33 million yuan in July 2009 to 538. 7 billion yuan in February 2022. It can be seen from Figure 1, from 2012 to 2021, the cross-border trade RMB settlement volume (SCT) showed an overall upward trend, and the growth rate was getting faster and faster, with a relative increase of 7. 14 times. Therefore, compared with the growth rate of the total import and export value, the RMB settlement volume of cross-border trade has increased more rapidly. It can be reflected as follows: firstly, the process of RMB internationalization is gradually accelerating in cross-border transactions; Secondly, the country attaches increasing importance to RMB settlement in cross-border transactions.

Table 1: Statistical Table of gross import and export value and RMB settlement of cross-border trade

from 2012 to 2021

year	IEV(USD100 million)	SCT(100 million yuan)
2012	38675. 2	29400
2013	41600	46300
2014	43063. 4	65500
2015	39656. 6	72300
2016	37355. 5	52300
2017	41227	43600
2018	46359. 83	51100
2019	45675. 2	60400
2020	46576. 86	138830
2021	60471	239412

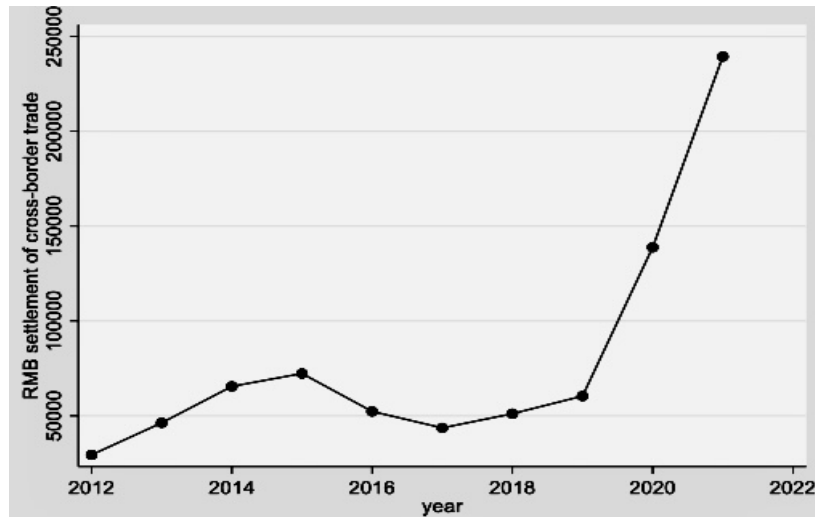


Figure 1: Changes of RMB Settlement Volume of Cross-border Trade from 2012 to 2021 (Unit: 100 million Yuan)

4. Empirical Analysis on the Impact of Cross-border Transactions on RMB Internationalisation

4.1. Index Selection and Data Sources

Index selection 1: Empirical analysis on the impact of cross-border RMB settlement on the overseas stock of RMB. In the selection of indicators, due to RMB is often affected by the exchange rate in the process of settlement, the nominal effective exchange rate index (RATE1) is taken as the intervention variable. Meanwhile, cross-border RMB settlement (SCT) is taken as the independent variable. Considering that Hong Kong region is the most significant representative of RMB stock, offshore RMB deposits (ORD) in Hong Kong, China are regarded as the dependent variable.

Index selection 2: As for the empirical analysis of the impact of RMB settlement of cross-border transactions on China's foreign trade, the nominal exchange rate of USD/RMB has an impact on the value of import and export, so the nominal exchange rate of USD/RMB (rate2) is taken as the intervention variable and the RMB settlement of cross-border transactions (SCT) is taken as the independent variable. Import and export values (IEV) considered as dependent variables.

The data mainly comes from the Hong Kong Monetary Authority and China Statistical Yearbook, covering the period from January 2012 to February 2022. In order to reduce the volatility of index data, this paper conducts logarithmic processing on the data, namely LnSCT, LnORD, Lnrate1, LnIEV and Lnrate2.

4.2. Model Construction

The main ideas of empirical analysis are as follows: firstly, unit root test is carried out on relevant data to determine the stationarity of data; Secondly, the residual sequence items were tested to see whether they were significant. Finally, Granger causality test is used to judge the relationship between

variables. The long-run equilibrium model is: $y_i = \partial_0 + \partial_1 x_i + u_i$, where, is the long-run elasticity of variable y with respect to variable xi. Accordingly, the long-run equilibrium model constructed in this paper is as follows:

$$\text{Model 1: } \ln ord = \partial_0 + \partial_1 \ln sct + \partial_2 \ln rate1 + u_i \tag{1}$$

$$\text{Model 2: } \ln iev = \partial_0 + \partial_1 \ln sct + \partial_2 \ln rate2 + u_i \tag{2}$$

4.3. Empirical Test of the Impact of Cross-border RMB Settlement on the Overseas Stock of RMB

Firstly, the unit root test was conducted on relevant data through Eviews8, and it was found in Table 2 that the first-order integration of LnSCT, LnORD and Lnrate all remained stable at 1%. It can be seen that there may be a long-term co-integration relationship between LnSCT, LnORD and Lnrate. Of course, since there are certain differences in the degree of stability among variables, it is necessary to verify the residual order items to further test whether the combined variables have stability. Therefore, the residual sequence test is required next.

Table 2: Stationarity test of LnSCT, LnORD and Lnrate1

variable	P	ADF	10%	5%	1%	conclusion
ln ord	0.9574	-0.84832	-3.149326	-3.448348	-4.037668	No
ln ord(A first order differential)	0.0000	-8.938518	-3.149720	-3.449020	-4.039075	Yes***
ln sct	0.6963	-1.803889	-3.151211	-3.451568	-4.044415	No
ln sct(A first order differential)	0.0001	-32.17889	-3.151211	-3.451568	-4.044415	Yes***
Lnrate1	0.4764	-2.215567	-3.148946	-3.447699	-4.036310	No
Lnrate1(A first order differential)	0.0000	-7.511874	-3.148946	-3.447699	-4.036310	Yes***

Secondly, it can be seen from Table 3 that the residual series test is significantly stable within 10%. Therefore, it can be inferred that there is a long-term co-integration relationship between cross-border RMB settlement and overseas RMB deposits.

Table 3: Residual sequence test

ADF Statistic	Level of significance	-3.209538	0.0879
Test critical values	1% level	-4.042042	
	5% level	-3.144920	
	10% level	-3.150549	*

Finally, through the Granger causality test among variables as Table 4 shows, the P-value of the causality of mutual variables exceeds the significance level of 10% is marked by “***”. The results show that the nominal effective exchange rate index has a positive effect on cross-border RMB settlement. There is a positive relationship between overseas RMB reserves and cross-border RMB settlement volume. The increase of overseas RMB reserves will lead to the improvement of nominal effective exchange rate index. It can be seen that the internationalization of RMB in cross-border transactions will promote the increase of overseas reserves.

Table 4: LnSCT, LnORD and Lnrate1 Granger tests

Null Hypothesis	Obs	F-Statistic	Prob.
Lnrate1 does not Granger Cause ln sct	112	5.74976	0.0042*
ln sct does not Granger Cause Lnrate1	112	1.92681	0.1506
ln ord does not Granger Cause ln sct	108	5.11880	0.0076*
ln sct does not Granger Cause ln ord	108	5.47827	0.0055*
ln ord does not Granger Cause Lnrate1	116	1.68791	0.1896*
Lnrate1 does not Granger Cause ln ord	116	2.46805	0.0894

4.4. Empirical Test of the Impact of Cross-border RMB Settle on China's Foreign Trade

Firstly, through the unit root test of LnSCT, LnIEV and Lnrate2, it is found in Table 5 an that all the other variables can be realized in the first-order difference except that they are significant at the level of 1% achieved by the second-order difference. This may be a co-integration relationship between the three variables, which needs to be further tested by residual series.

Secondly, Table 6 shows that the residual series test is significantly stable within 1%. As a result, it can be inferred that there is indeed a long-term cointegration relationship between cross-border RMB settlement and foreign trade.

Table 5: Unit root test of LnSCT, LnIEV and Lnrate2

variable	P	ADF	10%	5%	1%	conclusion
In sct	0.4474	-1.662421	-3.491345	-2.888157	-2.581041	No
In sct(A first order differential)	0.0001	-32.17889	-3.151211	-3.451568	-4.044415	Yes***
In iev	0.5280	-2.121078	-3.151673	-3.452358	-4.046072	No
In iev(A first order differential)	0.2204	-2.746962	-3.151440	-3.451959	-4.045236	No
In iev(The second order differential)	0.0000	-8.729371	-3.151673	-3.452358	-4.046072	Yes***
Lnrate2	0.6839	-1.830289	-3.148946	-3.447699	-4.036310	No
Lnrate2(A first order differential)	0.0000	-7.409019	-3.148946	-3.447699	-4.036310	Yes***

Table 6: Residual sequence test

ADF Statistic	Level of significance	-10.24340	0.0000
Test critical values	1% level	-4.039797	***
	5% level	-3.449365	
	10% level	-3.149922	

Finally, through the Granger causality test among variables in Table 7, the P-value of the causality of mutual variables exceeding the significance level of 10% is marked by “***”. The results show that China's foreign trade effectively promote the internationalization of RMB under cross-border transactions, while the internationalization of RMB has no significant role in promoting foreign trade. To sum up, the internationalization of RMB in cross-border transactions has no significant effect on promoting China's foreign trade, while the development of foreign trade has a greater effect on the internationalization of RMB.

Table 7: LnSCT, LnORD and Lnrate2 Granger tests

Null Hypothesis:	Obs	F-Statistic	Prob.
Lnrate2 does not Granger Cause Insct	112	1.43623	0.2424
Insct does not Granger Cause Lnrate2	112	0.08757	0.9162
Lniev does not Granger Cause Insct	112	4.84363	0.0097*
Insct does not Granger Cause Lniev	112	1.43321	0.2431
Lniev does not Granger Cause Lnrate2	120	0.22391	0.7997
Lnrate2 does not Granger Cause Lniev	120	0.33846	0.7136

5. Policy Suggestions on Cross-border Transactions to Promote RMB Internationalization

5.1. Further Improve RMB Settlement Business

Currently, when carrying cross-border business out to calculate the yuan, it often passes the review of multiple government departments, and there is in a lack of specialized competent authority. Therefore, it is necessary to set up a special department responsible for the development of the cross-border RMB settlement business. At the same time, it is also necessary to provide a good service level for transactions by simplifying the settlement process, improving the approval efficiency and reducing business costs, expecting to promote the process of RMB internationalization with the help of a good service environment.

5.2. Establish a Repatriation Mechanism for Overseas RMB

It is far from enough to rely on the cross-border export of the yuan, and it is also necessary to actively build a repatriation mechanism. For example, it is necessary to further increase the issuance of RMB bonds, and actively encourage overseas enterprises to use RMB funds for domestic investment, so as to promote the further realization of the international use of RMB and further deepen the internationalization process of RMB.

5.3. Enhance the Cross-border Transaction Structure to Enhance Foreign Trade Competitiveness

At present, China's cross-border trading products are mostly exported low-end manufacturing

products or agricultural products, which have strong substitutability and relatively low technological content, as a result, they lack the initiative in cross-border trading. At the present, In order to promote the internationalization of RMB, it is urgent for domestic enterprises to accelerate the transformation and upgrading of products and further increase the support for the semiconductor and other technology industries through the state. When China's cross-border trade products have high scientific and technological content, we can stand on the active side of the transaction, which will inevitably enhance the competitiveness of China's foreign trade, and then enhance the process of RMB internationalization.

6. Conclusion

To sum up, the data of the past ten years are taken as the main reference object, through the qualitative analysis of the status quo of cross-border RMB settlement and the impact of cross-border transactions on the internationalization process of the yuan, it is found that the current cross-border transactions promote the internationalization process of the yuan, and have a certain impact on the overseas reserves and foreign exchange reserves of RMB. In the meanwhile, by studying the impact of cross-border trade in the process of RMB internationalization, the following conclusions are drawn: At present, China can improve the RMB settlement business, build the overseas RMB reflux mechanism and improve the cross-border transaction structure, in order to promote the process of RMB internationalization through the development of cross-border transactions.

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