



The Impact of Covid-19 on the Internationalization of Renminbi

Song Chen

Economic Department, University of Toronto Mississauga, Ontario, L5L 1C6, Canada

Corresponding author's e-mail:kawschen1107@gmail.com

Abstract. This study is a multiple regression model to examine the impact of the epidemic on the internationalization of the Renminbi (RMB). The study finds that the epidemic has a significant impact on the internationalization of the RMB. By comparing the economic environment of each country under the epidemic, the article finds that China has achieved extraordinary results in dealing with the epidemic, as evidenced by the steady growth of GDP and the increase in the share of investment.

Keywords: Renminbi, Covid-19, China, Internationalization

1 Introduction

With the growing trend of international currency diversification after the 2008 financial crisis, the shortcomings of the dollar-based economic system have been exposed, and the risks arising from over-reliance on the dollar have increased. A wave of de-dollarization is rolling up. China has become the second largest economy in the world since 2010 [1]. In July 2009, China launched a cross-border trade settlement in RMB for designated enterprises in four pilot cities in China. RMB officially started to go worldwide [2].

The coronavirus is affecting the whole society as well as the economy in a dramatic and long-lasting way, with a preventive embargo between countries leading to a disruption of interactions between countries, which will further have a serious impact on the real economy [3]. In addition to the impact on the real economy, the coronavirus is also putting pressure on global financial markets, and there may be renewed concerns about the international status of the U.S. dollar and its role in the monetary system, as well as whether China will take advantage of the early lifting of the pandemic embargo to increase the influence of its currency.

China is doing its utmost to prevent and control the epidemic, which prevents further deterioration of the local situation and resume work soon. The benefits of these measures will be reflected in China's GDP as well as in its epidemic preparedness. In the year following the outbreak (2020), China became the only economy in the world with growth.[4]

2 Literature review

Hao et al (2022) examined the four lines of defense implemented by China for international travelers in an epidemic situation to prevent and control the epidemic [5]. The first line of defense is "customs protection," where any other person from outside China is required to provide negative nucleic acid and IgM anti-body. The second line of defense is "post-arrival quarantine", anyone entering China needs to be tested again for nucleic acid at the port of entry. If the test is negative, he/she will be allowed to pass through customs and will be required to go to a designated hotel for 7 days, followed by several days of home quarantine, CITS. If the test is positive, the person will be transferred directly to a designated medical facility for diagnosis and treatment. Until the test result is negative, the testers will be re-implemented in the centralized isolation of negative results and home isolation. The third line of defense is the "epidemic prevention laws and regulations". Any person who falsifies a health certificate conceals medical history or takes fever-reducing medication to avoid fever detection will be subject to criminal, civil, or administrative liability (depending on the circumstances). The fourth line of defense is "community follow-up," where the health status of any person in home isolation is monitored, including regular periodic nucleic acid testing and monitoring of the person's range of motion.

Yonghong has worked out an index to represent the degree of RMB internationalization. The Renminbi Internationalization Index (RII) is compiled by the Institute of International Monetary Studies at the Renmin University of China, and the index tracks the share of the renminbi in three areas: trade denomination, financial transactions, and foreign exchange reserves worldwide [6]. Prior to October 1, 2016, the RMB was not included in the SDR currency basket, so the level of RMB internationalization will not be measured using the internationally accepted official foreign exchange reserve share indicator due to the constraints of the International Monetary Fund (IMF) statistical methodology. (The purpose of the RII is to provide a convenient and effective tool to measure the actual level of RMB internationalization and thus improve the management of RMB internationalization. The value of the RII and the variation of several factors within it allow studying the magnitude and direction of the impact of different factors on the internationalization of the RMB. At the same time, the RMB Internationalization Index (RII) has increased 251 times over the past 11 years from 0.02 in 2010 to 5.02 by the end of 2020 (RII data is only updated to 2020), indicating that the international community has a significant recognition of the international currency function played by the RMB. The rapid growth of the RII is mainly driven by the RMB-denominated settlement volume of cross-border trade and boosted by RMB direct investment.

Table 1. RMB Internationalization Index System (Source from RII - A new indicator to measure the real level of RMB internationalization)

First-level indicators	Second-level indicators	Third-level indicators
	Trade	Share of RMB settlement in total world trade

International Billing Payment Function	Finance	Share of RMB credit in total global foreign credit
		Share of RMB-denominated bonds and notes in global international bond and note issuance
		Share of RMB-denominated bonds and notes in global international bond and note balances

Xian Wang described the experience of internationalization with the RMB since the RMB cross-border trade settlement initiative in 2009. The paper focuses on the experience of the RMB in three areas: firstly, the establishment of a local RMB clearing bank, secondly, the establishment of a bilateral RMB currency swap agreement and the possibility of RMB qualified foreign investors (RQFII) to allocate capital market quotas within China. In July 2009, China approved a pilot scheme for cross-border trade settlement and started trade settlement through RMB. Due to the special historical nature of Hong Kong, as the junction between Chinese and Western civilizations, Hong Kong is considered as an offshore market for RMB transactions. Hong Kong has become the world's largest offshore RMB liquidity market through the internationalization of Hong Kong's financial markets and China's regulatory control of the offshore RMB, followed by the establishment of RMB clearing banks in London (UK), Toronto (Canada), New York (USA), Tokyo (Japan) and Moscow (Russia). Bilateral RMB currency agreements can avoid the negative impact of shortages or fluctuations of the US dollar as well as to reach, by the end of 2020, the People's Bank of China signed bilateral local currency swap agreements with the central banks or monetary authorities of 40 countries for a total amount of more than 3.99 trillion RMB. (The RQFII program allows qualified foreign investors to use offshore RMB to invest in China's onshore financial markets, and in 2019, with the approval of the Chinese State Council, it was decided to remove the RQFII quota limit and the RQFII pilot country and region restrictions. In 2020, the RQFII business will have an inflow of RMB 1.29 trillion and an outflow of RMB 1.24 trillion, for a net inflow of RMB 52.631 billion. Finally, the authors state that although the RMB's global role is growing, its lack of global market representation, as well as China's control over the RMB and restrictions on capital flows, is a hindrance to the RMB's outward development. The final point is that since the global position of the US dollar is not predestined, it is through strong US economic as well as political attributes that it can be in a dominant position in the global investment market as well as the global trade market.

3 Method

This study is an extension of the RII data, especially how the data would change in an epidemic situation and how the country's international power would be represented. Econometric Methods. Our entire study will be analyzed through two multivariate regression models. The first model will be a multivariate segmented regression: in the first stage, the epidemic factor will be set to 0 (years 2010-2018) before the epidemic; in the second stage, the epidemic factor will be set to 1 (years 2019-2021) during the

epidemic; two other factors, RMB settlement and total debt, will also be added to the data to (Years 2010-2021). (Years 2010-2021); and the RII RMB internationalization index is used as our dependent variable. In the second multiple regression model, the epidemic factor is removed, and the other factors are kept constant (years 2010-2021). Multiple regression model. Multiple regression models are used to predict the results based on two or more independent variables to obtain parametric analysis. First model construction. In the first stage, we use RMB settlement volume as x1, total debt as x2 and epidemic as dummy variable (0) x3, while RMB internationalization index (RII) is used as dependent variable (y), and in the second stage the epidemic factor is used as a factor of practical significance (1), while other parameters are kept as usual, and finally multiple regression is performed.

4 Result

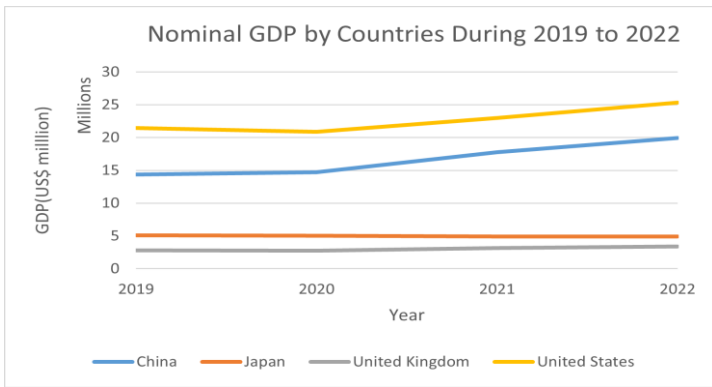


Fig. 1. RMB Internationalization Index System (Source from self-generated)

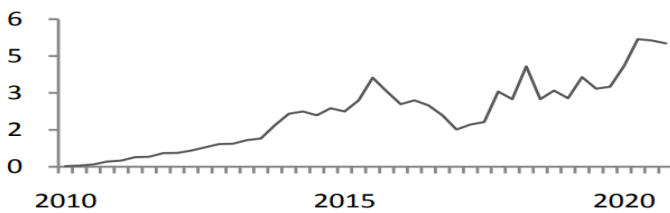


Fig. 2. Renminbi Internationalization Index in 2020 (Source from Internationalization Report 2020)

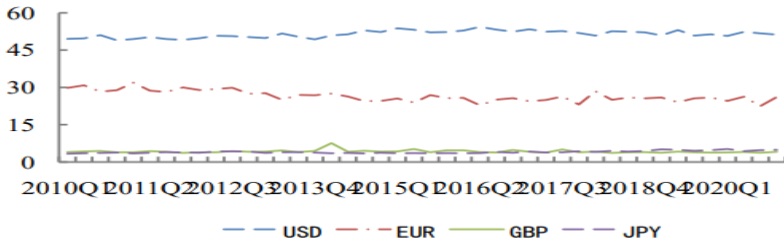


Fig. 3. Trends in Internationalization Index of Major World Currencies in 2020 (Source from Internationalization Report 2020)

Table 2. Regression Equation Data (Source from self-generated)

Year	RII	RMB Settlement Volume (Billion)	Total RMB Debt (Billion)	Epidemic Factor
2010	0.23	5063.4	98300	0
2011	0.58	20400	78000	0
2012	0.87	29400	80000	0
2013	1.69	46300	90000	0
2014	2.47	65500	110000	0
2015	3.21	72300	223000	0
2016	2.26	52300	361000	0
2017	3.13	43600	408000	0
2018	2.95	51100	436000	0
2019	3.03	60400	453000	1
2020	5.02	67700	573000	1
2021	5.05	79400	619000	1

Table 3. First Model Regression Output (Source from self-generated)

SUMMARY OUTPUT							
Regression Statistics							
Multiple R	0.973116435						
R Square	0.946955595						
Adjusted R Square	0.927063944						
Standard Error	0.418608169						
Observations	12						
ANOVA							
	df	SS	MS	F	Significance F		

Regression	3	25.02622 928	8.342 076	47.605 68	1.91E- 05			
Residual	8	1.401862 39	0.175 233					
Total	11	26.42809 167						
	Coeffi- cients	Standard Error	t Stat	P- value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	- 0.47675 897	0.331799 827	- 1.436 89	0.1886 83	-1.24189	0.2883 73	- 1.2418 9	0.2883 728
X Variable 1	3.71413 E-05	7.43382E -06	4.996 252	0.0010 58	2E-05	5.43E- 05	2E-05	5.428E -05
X Variable 2	3.89835 E-06	1.03318E -06	3.773 177	0.0054 41	1.52E- 06	6.28E- 06	1.52E- 06	6.281E -06
X Variable 3	0.13689 2206	0.425850 736	0.321 456	0.7561 03	-0.84512	1.1189 06	- 0.8451 2	1.1189 058

Table 4. Second Model Regression Output (Source from self-generated)

SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.9727 64326							
R Square	0.9462 70435							
Adjusted R Square	0.9343 30532							
Standard Error	0.3972 08296							
Observations	12							
ANOVA								
	df	SS	MS	F	Signifi- cance F			
Regression	2	25.00812	12.50 406	79.25 277	1.9318E -06			
Residual	9	1.41997	0.157 774					
Total	11	26.42809						
	Coeffi- cients	Standard Error	t Stat	P- value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%

Intercept	- 0.5175 7133	0.290877	- 1.779 35	0.108 889	- 1.17558 16	0.140 439	- 1.175581 61	0.1404 39
X Variable 1	3.7414 E-05	7.01E-06	5.338 973	0.000 469	2.1561E -05	5.33E- 05	2.15614E -05	5.327E -05
X Variable 2	4.1076 2E-06	7.61E-07	5.395 831	0.000 435	2.3855E -06	5.83E- 06	2.38554E -06	5.83E- 06

5 Discussion

From the Figure1, it is shown that in 2019, three other mainstream countries experienced a downward trend in GDP, and China is the only country whose GDP is growing. At the same time, the growth rate of China's Nominal GDP is surpassing that of the United States (10.06%) by 20.45% from 2020 to 2021; similarly, the growth rate of China's Nominal GDP (12.28%) is still faster than that of the United States (10.22%) from 2021 to 2022. The most important cornerstone of internationalization is the development of a currency, which will become a strong back card for China during the epidemic.

From Figure2, it is China's RMB index RII climbed sharply in 2020, with a significant year-on-year increase of 54.20%. China's success can be attributed to the continued consolidation of the RMB's international trade denomination and settlement function, the acceleration of financial market liberalization and a stable economic environment that has driven the internationalization of the RMB, despite the epidemic and the major tests facing the global economy and financial investments. (2021 Report) Figure 3 shows the internationalization index for the US dollar, the euro, the British pound, and the Japanese yen, compiled in the same way as the RII. In the same year the U.S. GDP fell due to improper epidemic control in the U.S., while the U.S. dollar's share of global reserves fell by 1.71%, resulting in a decline in the internationalization index of the U.S. dollar to 51.27; (IMF, 2020) the euro's internationalization index was 26.17 due to the increase in investment market share and thus the consolidation of the euro's currency position; the U.K. also experienced a decline in GDP due to improper epidemic control and the impact of Brexit. The internationalization index of the UK is 4.15 because of the negative GDP growth and the decline in the share of investment due to the epidemic and the impact of Brexit (IMF 2020); the internationalization index of the Japanese yen is 4.91 because of the continued low consumption and investment. All these signs indicate that due to the epidemic and the inability of these countries or organizations to cope well with it, the chain reaction has affected the economy, especially in terms of investment. Investors value a stable economic environment, which is a breakthrough for China in the case of the epidemic.

Last but the least, with the two models' regression outputs above, which first see that in R Square are presented about 0.946, as well as the absolute value of the fitted t-value is large representing the fitted regression equation is appropriate. Secondly the first model regresses the epidemic factor as a dummy variable, as well as the second model

removes it. We can find that the p-values of the other two Variables are below 0.05, indicating that the epidemic factor has a significant effect on the RII index.

At the same time, a Russian-Ukrainian war is taking place in Europe, and whatever the war turns out to be, it will not be possible to contain the spread of COVID-19, and as refugees flee, there will only be more new crowns spreading to neighboring countries and regions, and at the same time, the influx of war-affected patients will put more pressure on hospitals, which will further worsen the epidemic in Europe[7]. As a result of instability in Europe or war zones, more companies or investors will divest and invest in more stable financial markets or countries (China).

6 Conclusion

This study extends the study of the impact of the epidemic on the internationalization of the RMB through the RMB internationalization index. Firstly, I compare the basic data of different countries. GDP is the basis of a country's comprehensive national power and internationalization and using a timeline to review the changes in GDP of China and other major currency countries, I can learn that in the case of the epidemic, most countries show slow or even negative economic growth, which for China is equivalent to prove the socio-economic stability of the country. Secondly, by studying the RII indices of different countries, I specifically analyze the factors of the changes in the RII indices of other major currencies and the growing internationalization index of China, which will be attributed to the continuous improvement of the RMB international trade denomination and settlement function, as well as the accelerated opening of the investment market. The second aspect is the regression analysis of the RMB Internationalization Index on the epidemic factor, which demonstrates that the epidemic factor has a significant impact on the internationalization of the RMB. Finally, the difference in attitude between China and other countries towards the epidemic has led China to prove to the world that the economic environment is stable, which has led to more trust in the RMB and has inadvertently driven the internationalization of the RMB.

Finally, China should continue to use the "four lines of defense" to control the epidemic and ensure a stable economic environment. As the new coronavirus continues to mutate and become more transmissible, the Chinese government should strictly monitor foreigners while recovering the economy. The government should provide more encouragement and support to the online investment market. The investment market is the main means of circulation for the offshore RMB, which has an extraordinary impact on stimulating the internationalization of the RMB.

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