ISSN: 2414-1895 DOI: 10.6919/ICJE.202109_7(9).0025

Empirical Analysis of the Relationship between Monetary Policy and Real Exchange Rate from the Perspective of "One Belt and One Road"

Xinyi Zhao[1,*], Ningxin Zhang[2], Renzheng Zhao[3]

[1]Institute of Finance, Anhui University of Finance and Economics, Bengbu 233030, China;

[2]School of Accounting, Anhui University of Finance and Economics, Bengbu 233030, China.

*Corresponding Author

Abstract

As an important strategy of China's opening up, the construction of "One Belt and One Road" has greatly promoted the economic and trade cooperation between China and the countries along the "One Belt and One Road", and has important strategic significance for promoting the internationalization of RMB. Based on 14 "neighbourhood" all the way along the country (or region) currency to build "area" of RMB real effective exchange rate index, select the name of market interest rates, credit scale, the money supply as a monetary policy tool variable VECM model is established, and the empirical analysis of the "area" under the perspective of our country monetary policy and the relationship between real exchange rate. The results show that monetary policy changes have an impact on the change of the "One Belt And One Road" RMB real effective exchange rate, and there is a long-term stable equilibrium relationship between the two. Monetary policy can adjust the fluctuation of the real effective exchange rate in the short term and promote its long-term stable development. This paper proposes that the government should take full account of the possible impact of monetary policy changes on RMB exchange rate fluctuations, strengthen the supervision of foreign exchange market, continue to deepen the market-oriented reform of RMB exchange rate, and promote the process of RMB internationalization.

Keywords

"One Belt and One Road"; "One Belt and One Road" RMB Real Effective Exchange Rate Index; Monetary Policy; Vector Error Correction Model (VECM).

1. Introduction

In 2013, China put forward the "One Belt And One Road" cooperation initiative. With the development and construction of the "Belt and Road" economic zone, China's economic cooperation with countries along the Belt and Road has been increasingly enhanced, and foreign trade, investment and other economic activities have been increasingly active, contributing to the improvement of China's own economic strength and the economic development of countries along the Belt and Road. As a lever to regulate economic exchanges between different countries and regions, the fluctuation of exchange rate may affect the cost and price of imported and exported commodities in the international market, and exert an impact on the economic development between China and countries along the Belt and Road.

Monetary policy is an important policy tool to maintain the stable operation of the macro economy. It not only has an impact on the economic development of a country, but also spills out to other

ISSN: 2414-1895 DOI: 10.6919/ICJE.202109_7(9).0025

countries through economic activities such as international trade and capital flow [1]. Zhou Xiaochuan (2017) believes that the role of RMB should be actively played in the construction of "One Belt And One Road" [2]. In the process of RMB exchange rate system reform, due to China's loose monetary policy, the pressure of RMB appreciation is high. Although the People's Bank of China has repeatedly implemented measures such as lowering the reserve ratio and interest rate, the effect of monetary policy on foreign exchange market regulation is questioned [3]. Therefore, to explore the impact of monetary policy on RMB exchange rate fluctuations is particularly important for maintaining exchange rate stability under the floating exchange rate system. In conclusion, this paper uses VECM model to empirically study whether China's monetary policy tools have an impact on exchange rate fluctuations under the background of "One Belt And One Road" and the adjustment path to achieve long-term equilibrium between the two.

2. Literature review

In view of the interaction mechanism between China's monetary policy and RMB exchange rate fluctuations, Chen Chuanglian (2011), Ding Zhengliang and Ji Chengjun (2014) investigated the relationship between monetary policy, output and RMB real exchange rate fluctuations based on VAR model and BQ-SVAR model. The results show that the short-term fluctuations of the real exchange rate of RMB are mainly caused by the economic cycle fluctuations and systemic endogeneic adjustment, while the currency shocks have a long-term impact on the real exchange rate fluctuations of RMB [4][5]. Zhao Wensheng and Zhang Yishan (2012) used the short-term sign constraint method to identify the impact of monetary policy on exchange rate fluctuations, and concluded that the tight monetary policy adopted by China and the loose monetary policy adopted by the United States would lead to the continuous appreciation of the exchange rate of RMB against the dollar [6]. Wu Anbing and Jin Chunyu (2019) investigated the impact of monetary policy on RMB exchange rate fluctuations based on STAR model and LT-TVP-VAR model, and concluded that the positive effect of expansionary monetary policy on RMB real exchange rate fluctuations was stronger than the negative effect of contractionary monetary policy on RMB real exchange rate fluctuations [7]. Wu Zhaochun (2020) constructed the pressure index of RMB and foreign exchange market, built a time-varying parameter measurement model, and used impulse response method to explore the dual time-varying influence of the transformation of monetary policy and macro-prudential management on the exchange rate [8]. Zhang yingying countries along the (2020) consider the difference of monetary policy, the overflow index, the system GMM method to quantitatively measure the yuan and the "area" all the way along the spillover effects of major currencies, and to explore the dynamic evolution of net overflow and function way, obtained in recent years, the yuan and the "area" all the way along the spillover effects between the major currencies gradually increases, The similarity of monetary policy is not the key factor for RMB to exert influence in the "Belt and Road" monetary circle [9].

In view of the impact of exchange rate fluctuations and monetary policies on the macro economy, Lu Dong, Zhou Zinan et al. (2019) and Huang Yiping et al. (2019) respectively concluded the asymmetric impact of RMB exchange rate fluctuations on monetary policies by putting forward the dual-pillar macro-control framework [10]. The floating exchange rate system has stronger macroeconomic stability than the fixed exchange rate system [11]. Jian-ping ding, and liu (2020), the creative use of volatility regression fitting method, to improve China's monetary policy from the perspective of policy interest rate uncertainty index, further studied in the different degree of monetary policy under the condition of uncertainty, the yuan against the dollar in macroeconomic fundamentals reaction in monetary policy uncertainty is high, Increase central bank exchange rate communication [12].

The research significance and innovation of this paper are as follows: firstly, the impact of monetary policy on exchange rate is discussed from the perspective of "One Belt And One Road", which can be applied to economic transactions with other countries or regions. Secondly, combined with the actual development of "One Belt And One Road", the representative currencies that have signed relevant contracts with China as of July 2020 are selected to construct the "One Belt And One Road" RMB real effective exchange rate index after excluding the impact of inflation differences among

ISSN: 2414-1895 DOI: 10.6919/ICJE.202109_7(9).0025

different countries. Finally, based on the VECM model, the paper studies the impact of short-term monetary policy adjustment on the short-term fluctuations of the "One Belt And One Road" real effective exchange rate of RMB.

3. Indicator selection and data description

3.1 Construction of "One Belt And One Road" RMB real effective exchange rate index

The current research on the effective exchange rate of "One Belt And One Road" regions mainly adopts the following indicators: "One Belt and One Road" RMB exchange rate index and a series of sub-indexes released by the Bank of China in 2015, the CFETS RMB exchange rate index at the end of 2019, and the real effective exchange rate of RMB against the US dollar, etc. Considering that it is difficult to obtain monthly value of the "One Belt And One Road" RMB exchange rate index, the inclusion of CFETS RMB exchange rate index and the real effective exchange rate of RMB against US dollar or only including currencies of non-" One Belt And One Road "countries is not representative of the" One Belt And One Road "RMB real exchange rate. Therefore, this paper adopts Ma Linzi and Li Bo [13] to construct the "One Belt And One Road" RMB real effective exchange RATE index: by referring to the compilation method of CFETS RMB exchange RATE index and real effective exchange RATE index (REER), the "One Belt And One Road" RMB real effective exchange RATE index (RATE) is compiled.

In this paper, 14 currencies that have signed the "One Belt And One Road" cooperation documents with China and can be directly traded with RMB by July 2020 are selected as a basket of currencies of the "One Belt And One Road" RMB Real Exchange Rate Index. The weight of the above 14 currencies in the currency basket of CFETS RMB exchange RATE index was normalized to obtain the sample currency weight of "One Belt And One Road" RMB real exchange RATE index (RATE), as shown in Table 1. Exchange rate index selection from January 2017 to July 2020 RMB currency monthly average central parity rate of the 14, a total of 41 group.

Table 1. The weight of the sample currency in the "One Belt And One Road" RMB Real Exchange Rate Index

Currency	Abbreviation	Normalized weights
The euro	EUR	0.3322
The won	KRW	0.2190
Malaysian ringgit	MYR	0.0763
The Singapore dollar	SGD	0.0653
The Thai baht	THB	0.0592
Russian ruble	RUB	0.0535
Saudi riyal	SAR	0.0405
UAE Dirhams	AED	0.0380
South Africa's yuan	ZAR	0.0362
Mexican dollar	MXN	0.0344
Turkish lira	TRY	0.0169
Polish zloty	PLN	0.0134
The New Zealand dollar	NZD	0.0089
Hungarian forint	HUF	0.0063

In order to eliminate the impact of inflation differences among countries, the CPI of each country from January 2017 to July 2020 was used to deflate the monthly average central parity rate of RMB against 14 currencies. The weighted arithmetic average method is used to calculate the "One Belt And One Road" RMB real effective exchange RATE index (RATE) after eliminating the price factor. The base period of the index is selected as January 2017, and the base period value is 100. The specific calculation formula is as follows:

$$\mathrm{RATE}_t = \frac{100\sum_{i=1}^{14}\frac{e_{it}CPI_{0t}}{CPI_{it}}\omega_i}{RATE_1}, t = 2,3,\cdots,42$$

ISSN: 2414-1895 DOI: 10.6919/ICJE.202109_7(9).0025

$$\mathrm{RATE}_1 = \sum_{i=1}^{14} \frac{e_{i1} CPI_{0t}}{CPI_{i1}} \omega_i$$

Wherein, RATE_t represents the "One Belt And One Road" RMB real effective exchange rate index in month t, e_{it} represents the monthly average middle rate of RMB against the currency of country i, CPI_{0t} represents the CPI value of China in month t, CPI_{it} represents the CPI value of country I in month t, and ω_i represents the weight of currency basket after normalized treatment in country i.

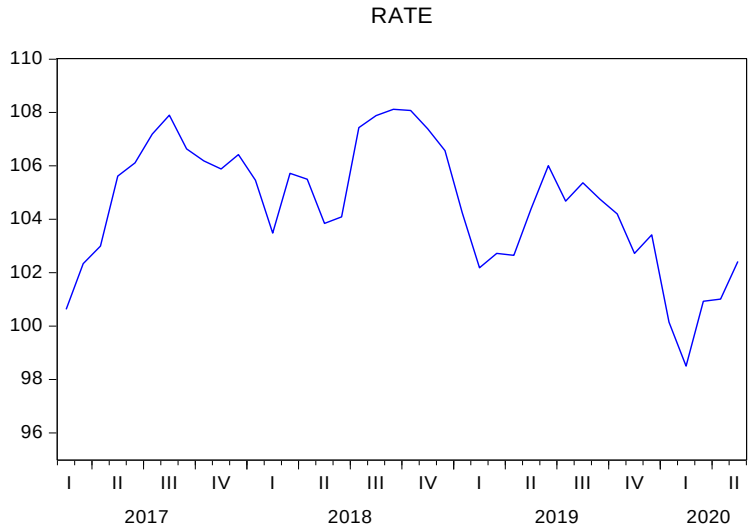

Figure 1."One Belt And One Road" RMB Real Exchange Rate Index

As can be seen from Figure 1, before the fourth quarter of 2019, the "One Belt And One Road" RMB real effective exchange rate index had a small fluctuation, but the overall level was improved compared with that of 2017, indicating that since the end of 2018, the status and recognition of RMB in the "One Belt And One Road" cooperative countries were continuously and steadily enhanced. However, in the fourth quarter of 2019 and the first quarter of 2020, the "One Belt And One Road" RMB real exchange rate index was lower than the base period, reflecting that the COVID-19 may have temporarily damaged China's import and export, and the RMB purchasing power declined slightly, resulting in a lower exchange rate. In the second quarter of 2020, the "Belt and Road" RMB real effective exchange rate index began to rebound, and the "Belt and Road" import and export gradually returned to normal.

3.2 Selection of monetary policy indicators

From the perspective of monetary policy instruments in China, this paper selects nominal market interest rate, credit scale and money supply as the instrument variables of monetary policy.

Since the interbank offered rate can quickly reflect the supply and demand of market currencies and is often used as the proxy rate of the base interest rate, the weighted average of the monthly interbank offered rate (INT) is selected as the nominal market interest rate. Select the amount of newly added RMB loans of financial institutions to reflect the credit scale [14]. The broad money supply (M2) used in most literatures was selected as the proxy variable of money supply.

3.3 The data source

In this paper, the weight of CFETS RMB exchange rate index basket and the monthly average central parity rate of RMB against 14 currencies are derived from the website of China Foreign Exchange Trade System and National Interbank Offering Center. The CPI data are from the International Financial Statistics database of the International Monetary Fund. Data of weighted average monthly interbank offered rate (INT), newly increased RMB DEBT of financial institutions and broad money supply (M2) are all from the database of China Economic Network.

ISSN: 2414-1895 DOI: 10.6919/ICJE.202109_7(9).0025

4. The empirical analysis

4.1 Stationarity test

First of all, in order to avoid drastic fluctuations of data, this paper conducts logarithmic processing on the "One Belt And One Road" RMB real effective exchange RATE index (RATE), nominal market interest RATE (INT), credit scale (DEBT) and money supply (M2), and obtains LNRATE, LNDebt, LNINT and LNM2. Then, in order to avoid the influence of pseudo regression on the model, the ADF unit root test of these four variables was carried out in the form including intercept term and trend term, including intercept term and neither of them in order to test the default SIC criterion.

Eviews9 was used to obtain the test results, as shown in Table 2, and it was found that lnInt and lnM2 had unit roots at the significance level of 5%. Continue to first order difference of four variables of unit root test, the test results as shown in table 3, available delta LNRATE, delta LNDEBT, delta LNINT, delta LNM2 under 5% significance level, there is no unit root, all variables are first order list, There may be a co-integration relationship between lnRate and lnDebt, lnInt and lnM2.

Table 2. Unit root test of the original variable

Variable	Checked formula(C,T,L)	ADF test value	5% significance level	Stationarity
LNRATE	(C,T,3)	-4.340148	0.0074	Steady
LNDEBT	(C,T,0)	10.014900	0.0000	Steady
LNINT	(C,T,3)	-2.795962	0.2075	Unsteady
LNM2	(C,T,0)	-2.535939	0.3103	Unsteady

*Note: C and T represent intercept term and trend term respectively, and L represents the lag order adopted. The following table.

Table 3. The Unit Root Test of the First Difference of Variables

Variable	Checked formula(C,T,L)	ADF test value	5% significance level	Stationarity
△LNRATE	(0,0,0)	-4.926504	0.0000	Steady
△LNDEBT	(0,0,0)	16.435730	0.0000	Steady
△LNINT	(0,0,2)	-2.758467	0.0071	Steady
△LNM2	(C,0,0)	-8.303685	0.0000	Steady

4.2 Co-integration relation test

The co-integration relationship refers to the long-term stable equilibrium relationship existing among non-stationary economic variables [15]. In this paper, the Johansen co-integration test method was selected. Based on the VAR model, the co-integration relationship was determined by testing the regression coefficient and the co-integration equation was obtained. First, a vector autoregressive model was established to determine the optimal lag number. The results are shown in Table 4 below. According to the information judgment criterion, the lag order of the co-integration test is selected as 4, and the lag period of the co-integration test is 3. Finally, the characteristic root trace test and the maximum characteristic root test were used to make specific judgments. The results are shown in Table 5 below.

Table 4. Judgment of the optimal lag order of vector autoregressive model

Lag	LogL	LR	FPE	AIC	SC	HQ
1	282.609486	NA	0.000000	-14.032080	-13.34257*	-13.786760
2	301.894293	30.449700	0.000000	-14.204960	-12.825940	-13.714320
3	324.764261	31.295750	0.000000	-14.566540	-12.498010	-13.830570
4	349.914199	29.12098*	4.28e-12*	15.04812*	-12.290080	14.06683*

*Note: * indicates that under each inspection principle, the optimal lag period corresponding to this value should be selected

ISSN: 2414-1895 DOI: 10.6919/ICJE.202109_7(9).0025

Table 5. Results of Johansen co-integration test

Null hypothesis	Eigenvalue	Test of trace of characteristic root			The test of the maximum eigenroot		
		Statistic	The 5% threshold	P value	Statistic	The 5% threshold	P value
None*	0.702182175	79.3280638	47.85612716	6.88E-06	46.028390	27.584340	0.000100
Atmost1	0.482240633	33.2996782	29.79707334	0.01896817	25.013300	21.131620	0.013500
Atmost2	0.171440926	8.2863801	15.49471288	0.43528965	7.146551	14.264600	0.471900
Atmost3	0.029550091	1.13982868	3.841465501	0.28568768	1.139829	3.841466	0.285700

The results of both characteristic root test and maximum characteristic root test show that there are two co-integration equations at the significance level of 0.05. Therefore, there is a long-term stable equilibrium relationship between real exchange rate and China's monetary policy.

4.3 Vector error correction model

Vector error correction model (VECM) is a vector autoregressive model (VAR) with co-integration constraints, which can reflect the short-term fluctuation relationship of variables. The basic idea is that when there is a co-integration relationship between the variables, there is a long-term stable relationship between the variables, which can be maintained through continuous adjustment in the short-term dynamic process. Therefore, any group of co-integrated time series variables has an error correction mechanism, which reflects short-term adjustment behavior. In the following, the vector error correction model (VECM) is established to study how to repair the short-term deviation from the equilibrium state to the equilibrium state.

Johansen normalized co-integration equation:

$$\mathrm{ECM}_{1,t-1} = \mathrm{LNDEBT}(-1) - \underset{(-3.55945)}{2.739702}\mathrm{LNM2}(-1) - \underset{(-4.19058)}{12.45445}\mathrm{LNRATE}(-1) + 87.97234$$

$$\mathrm{ECM}_{2,t-1} = \mathrm{LNINT}(-1) + \underset{(3.74538)}{5.996895}LNM2(-1) + \underset{(4.81683)}{29.77697}LNRATE(-1) - 226.1384$$

In this co-integration equation, ECM is the error correction term, and the lag period of each variable is significant at the significance level of 5%. In the long run, M2, Int and Rate change in the opposite direction, while DEBT and Rate change in the positive direction. Therefore, there is a long-term equilibrium relationship between real exchange RATE and nominal market interest RATE, credit scale and money supply.

The vector error correction model (VECM)is as follows:

$$\begin{aligned}
\Delta\mathrm{LNRATE} &= \underset{(1.79504)}{0.044182}^{*} ECM_{1,t-1} + \underset{(0.12931)}{0.001684}^{*} ECM_{2,t-1} \\
&- \underset{(-1.94310)}{0.042262}^{*}\Delta\mathrm{LNDEBT}(-1) - \underset{(-1.81354)}{0.029153}^{*}\Delta\mathrm{LNDEBT}(-2) + + \underset{(0.01210)}{0.000103}^{*}\Delta\mathrm{LNDEBT}(-3) \\
&- \underset{(-0.34441)}{0.008032}^{*}\Delta\mathrm{LNINT}(-1) - \underset{(-1.42159)}{0.028811}^{*}\Delta\mathrm{LNINT}(-2) - \underset{(-0.19753)}{0.003935}^{*}\mathrm{LNI}(-3) \\
&- \underset{(-0.78453)}{0.462624}^{*}\Delta\mathrm{LNM2}(-1) - \underset{(-0.18244)}{0.097632}^{*}\Delta\mathrm{LNM2}(-2) - \underset{(-2.27967)}{1.263531}^{*}\Delta\mathrm{LNM2}(-3) \\
&+ \underset{(1.31507)}{0.229606}^{*}\Delta\mathrm{LNRATE}(-1) + \underset{(0.19140)}{0.039287}^{*}\Delta\mathrm{LNRATE}(-2) + \underset{(1.13733)}{0.210201}^{*}\Delta\mathrm{LNRATE}(-3) \\
&+ \underset{(1.89271)}{0.013431}
\end{aligned}$$

According to the equation, the error correction coefficients are respectively 0.044182 and 0.001684, both greater than 0, indicating that the unbalanced lag of one period has a positive adjustment effect on the "Belt and Road" RMB real effective exchange RATE index. When the short-term fluctuation of the RATE deviates from the equilibrium, It will adjust to the equilibrium state at an adjustment speed of 0.044182 and 0.001684 respectively.

AR root test was carried out on the above VECM model to test the stability of the model. It can be seen from Figure 2 that all the reciprocal values of the roots of characteristic polynomials are less than or equal to 1, which indicates that the model is stable.

ISSN: 2414-1895 DOI: 10.6919/ICJE.202109_7(9).0025

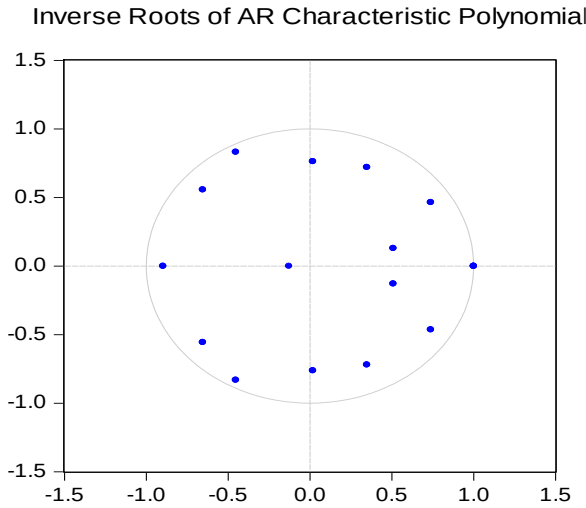

Figure 2. The graph of the inverse root of the AR characteristic polynomial

4.4 Variance decomposition

In order to further understand the importance of each new interest to endogenous variables, variance decomposition was used to analyze the contribution of each structural impact to the change of endogenous variables, and the results were shown in Figure 3.

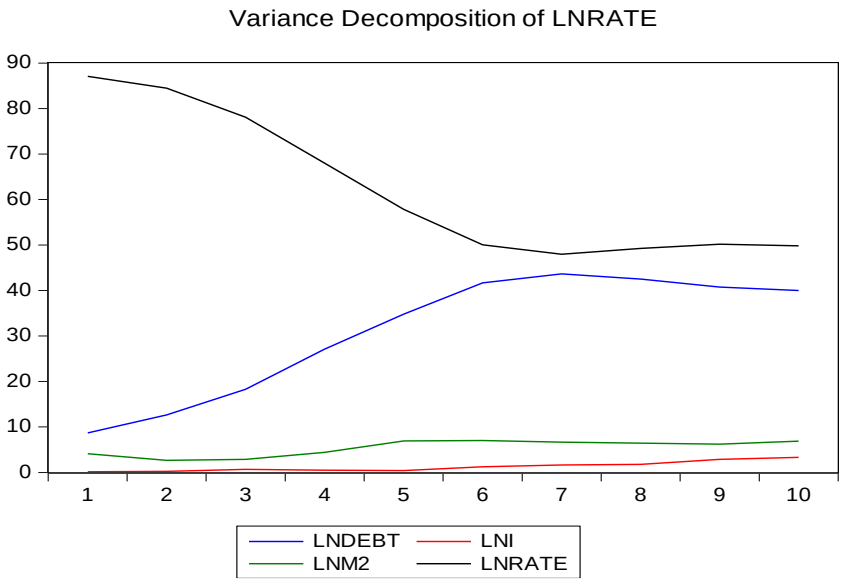

Figure 3. Diagram of variance decomposition

As can be seen from Figure 3, the main factor that causes the change of the real effective exchange rate of "One Belt And One Road" is its own new interest rate impact, and the contribution of new interest rate impact decreases slowly over time, reaching the maximum 52% in the seventh period. If the contribution of "One Belt And One Road" real effective exchange rate is not taken into account in the early stage, the contribution of each new RMB loan amount of financial institutions to the real effective exchange rate is the largest, and the contribution rate gradually increases, and reaches the maximum 44% in the seventh period, and then gradually decreases slightly. The contribution of money supply and nominal market interest rate to the "Belt and Road" real effective exchange rate increased steadily from the first phase to the tenth phase, and reached the maximum value of 7% and 2% respectively in the tenth phase. Therefore, the fluctuation of the "One Belt And One Road" real effective exchange rate, in addition to its own influence in the early stage, mainly comes from the

contribution of financial institutions' new RMB loans, while the contribution of money supply and nominal market interest rate is small.

5. Conclusions and policy recommendations

5.1 Conclusion

In this paper, the "One Belt And One Road" RMB real effective exchange RATE index (RATE) was constructed, and the vector error correction model (VECM) was used to empirically investigate its correlation with monetary policy instrument variables: The paper empirically analyzes the possible influence of major monetary policy tools on the exchange rate under the background of "One Belt And One Road". The results showed that:

First, nominal market interest rate, credit scale and money supply can be used as the instrumental variables of monetary policy to illustrate the impact of monetary policy on the change of the "One Belt And One Road" RMB real effective exchange rate.

Second, there is a long-term and stable equilibrium relationship between monetary policy and the real effective exchange rate. Monetary policy changes can adjust the fluctuations of the real effective exchange rate in the short term and promote its long-term and stable development.

5.2 Policy Recommendations

According to the research conclusions, this paper puts forward the following three policy suggestions:

First, in order to maintain the relative stability of RMB exchange rate and prevent exchange rate risks, the Central People's Bank of China should fully consider the impact of RMB exchange rate fluctuations when formulating monetary policies. In the period of economic prosperity, the central bank can appropriately adopt low-intensity tightening monetary policy to reduce the fluctuation range of RMB exchange rate. In the period of new normal when economic fluctuations are relatively stable, the central bank can appropriately adopt high-intensity monetary policy to prevent drastic fluctuations of RMB exchange rate and stabilize the foreign exchange market by stimulating economic growth.

Second, the government should continue to deepen the market-oriented reform of RMB exchange rate and further promote the process of RMB internationalization. At present, China's exchange rate system reform has made some episodes of progress, but does not mean that China's exchange rate system has perfect, still need to continue to promote the reform of exchange rate market mechanism, strengthen the two-way floating elasticity of RMB exchange rate, insist on advancing along the "area" initiative, adhere to the win-win cooperation, to strengthen the cooperation of countries along the way "area", We should strengthen trade and investment connectivity and deepen cooperation on financial policies of countries along the "One Belt And One Road" routes.

Third, the government in promoting the process of RMB internationalization, more to strengthen the regulatory standards in the foreign exchange market and supervision, strengthen the regional risk management of RMB exchange rate, accelerate perfecting the market risk aversion tools and risk early warning mechanism, avoid or weaken the "area" all the way along the major currencies exchange rate of RMB exchange rate is bigger, Maintain the basic stability of RMB exchange rate and enhance the influence of RMB in the "One Belt And One Road" currency circle.

References

[1] Zhang Yingying. Analysis on the Influence of RMB in the "One Belt and One Road" Monetary Circle-Information Spillover Effect and Its Action Channel [J]. Business Research, 2020(01):74-84.

[2] Zhou Xiaochuan. Discussions and co-construction of "One Belt And One Road" investment and financing cooperation system [J]. China Finance, 2017(09):6-8.

[3] Wu Anbing, Jin Chunyu. The effect of monetary policy and output shock on the fluctuation of RMB real exchange rate [J]. International Finance Studies, 2019(12):23-32.

[4] Chen Chuanglian. Research on the Cause Decemption of RMB Exchange Rate Fluctuation -- Estimation Based on BQ-SVAR Model [J]. Economic Problems in China, 2011 (6): 65-75

[5] Ding Zhengliang, Ji Chengjun. An Empirical Study of China's Import, Export, Real Exchange Rate and Economic Growth Based on VAR Model [J]. International Trade Issues, 2014 (12): 91-101

[6] Zhao Wensheng, Zhang Yishan. Monetary policy shocks and the dynamics of RMB exchange rate [J]. Financial Research, 2012(08):1-15.

[7] Wu Anbing, Jin Chunyu. The effect of monetary policy and output shock on the fluctuation of RMB real exchange rate [J]. International Finance Studies, 2019(12):23-32.

[8] Wu, C.C., Monetary Policy, Macroprudential Policy and Exchange Rate Fluctuation: A New Perspective Based on Time-varying Effects [J]. Financial Forum, 2020,25(03):18-28.

[9] Zhang Yingying. Analysis of the Influence of RMB in the "One Belt and One Road" Monetary Circle -- Information Spillover Effect and Its Action Channel [J]. Business Research, 2020(01):74-84.

[10] Lu Dong, Zhou Zinan, Zhou Hang. A study on the stabilization effect of "double pillar" regulation under the open economy [J]. Financial Research, 2019(12):125-146.

[11] Yiping Huang, Yujing Cao, Kunyu Tao, Changhua Yu. Monetary policy and macro-prudential policy together support macroeconomic stability [J]. Financial Research Journal, 2019(12):70-91.

[12] Ding Jianping, Liu Lu. The Uncertainty of China's Monetary Policy and the Effect of Macroeconomic News on RMB Exchange Rate [J]. Finance and Trade Economics, 2020,41(05):19-34.

[13] Ma Linzi, Li Bo. Empirical study on the relationship between real exchange rate and import and export from the perspective of "One Belt And One Road" [J]. Statistics and Decision Making, 2020, 36(19): 106-110.

[14] Pan Haifeng. Statistics and Decision, 2020, 36(18):141-144. (in Chinese)

[15] Zhang Xiaodong. The Fundamentals of Econometrics [M]. Tianjin: Nankai University Press, 2014.