

Trade Opening and The Real Effective Exchange Rate of the RMB

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Abstract: This paper uses the Redux model and shows that the fluctuation of the RMB under certain fluctuations; then analyzes the effect of the fluctuation of the RMB on the actual effective exchange rate. The study found that trade opening can reduce the fluctuation of the real effective exchange rate of the RMB; the rationalization of industrial structure can also enhance trade opening and restrain the real effective exchange rate fluctuation of the RMB. Meanwhile, the "Belt and Road" initiative intensifies the real effective exchange rate fluctuation of the RMB, possibly due to the change of the "Belt and Road" initiative and implementation in the total industrial structure of import and export. Therefore, all provinces (autonomous regions and municipalities directly under the Central Government) should increase basic research such as science and technology, promote the rationalization of industrial structure, and make the help of the good opportunity of the "Belt and Road" initiative to reduce the real effective exchange rate fluctuations of RMB.

Keywords: Real effective exchange rate, Trade opening, Industrial structure.

1. Introduction

In 2005, the central bank announced the reform of the RMB exchange rate system, implementing the RMB exchange rate system based on market supply and demand; meanwhile, in 2010, the central bank further promoted the RMB exchange rate mechanism and enhanced the flexibility of the RMB exchange rate; in 2012, the central bank announced the floating rate of RMB on the interbank spot foreign exchange market increased from 5% to 1% and expanded the floating range from 1% to 2% in 2014. Since the reform of the RMB exchange rate formation mechanism, 2005-2013 the yuan against the dollar unilateral appreciation status, 2014-2016 the yuan against the dollar for unilateral depreciation, after 2017, the RMB exchange rate fluctuation become the norm, the actual exchange rate fluctuation is also increasing, at the same time with the development of the outbreak and the trade war, the actual exchange rate fluctuation is also increasing. It can also be seen that, along with China's opening to the outside world and the deepening development of the market economy reform, the RMB exchange rate is also constantly changing. The development of China's export trade and the fluctuation of RMB exchange rate also have a certain internal influence mechanism, so it is necessary to study the internal influence factors leading to the fluctuation of the real effective exchange rate of RMB.

Obstfeld & Rogoff (1995,1996) believes that trade opening can reduce exchange rate fluctuations. Since China's accession to the WTO, the trade volume of goods and services accounted for 64.48% of domestic GDP in 2006, but dropped to 31.73% in 2020[1,2]. So, will the trade opening increase the fluctuation of the RMB exchange rate? What are the internal influencing factors that lead to the RMB exchange rate fluctuation? Therefore, under the background of the influence of RMB exchange rate fluctuations and the declining proportion of import and export trade, it is of certain practical significance to study the impact of trade opening on the real effective exchange rate fluctuations of RMB, clarify the subsequent development direction of import and export

trade, do a good job in preventing exchange rate risks, and promote the steady development of China's economy.

2. Literature Review

Scholars have done a lot of research on the factors affecting the exchange rate fluctuations. Some scholars study and analyze the influence of trade opening on exchange rate fluctuation from the influencing factors of trade opening based on the theoretical mechanism. Obstfeld & Rogoff (1995,1996) believes that trade opening can reduce the transaction costs and frictions of international trade, and can alleviate the negative impact on the real exchange rate fluctuations from the nominal factors[1,2]. Hau (2000) incorporated labor force into the model and divided products into traded products and non-tradable products[3]. The research results show that non-traded products will cause short-term deviation of purchasing power parity under the action of asymmetric currency shock, which will aggravate the exchange rate fluctuations. At the same time, Drozd & On this basis & Nosal (2008) pointed out that in order to maintain market share, manufacturers will maintain the law of one price of tradable goods, so the increase of tradable goods can reduce the real exchange rate fluctuations[4]. The empirical analysis based on the Redux model of Hau (2002) found that there was a significant negative relationship between trade opening and real effective exchange rate fluctuations[5]. Yang Changjiang and Cheng Feng (2010) studied and analyzed the different effects of traded goods and non-traded goods on the real effective exchange rate fluctuations of RMB[6]. Tang Yahui and Chen Shoudong (2010) found that there is a non-linear co-integration relationship between the real effective exchange rate and trade opening[7]. Calderon & Kubota (2017) studied and analyzed the impact of the overall and detailed indicators of trade opening on the real effective exchange rate fluctuations, and believed that the trade opening of industrial goods can reduce the real effective exchange rate fluctuations[8].

Some scholars conduct their analysis from different

perspectives. Rogoff (1999) believes that financial integration will have an impact on real effective exchange rate fluctuations[9]. Lane & Milesi-Ferretti (2005) believes that the country's foreign debt equity structure will also affect the exchange rate fluctuations[10]. Subsequently, literature on the real effective exchange rate fluctuations of RMB from the perspective of monetary, fiscal and output shocks (Wu Anbing and Jin Chunyu, 2019, etc.) has emerged[11]. There is also literature on price stickiness (Taylor & Taylor, 2004), population age structure (Yang Changjiang, Huangfu Bingchao, 2010) and other different aspects of the real effective exchange rate fluctuations[12,13].

Through the review of the existing literature, the research on the influencing factors of actual exchange rate fluctuations is mainly reflected in these two aspects: on the one hand, the domestic literature studies the impact of RMB exchange rate fluctuations and other aspects; on the background of the new normal of current economic development and the continuous upgrading of China's industrial structure, the development of "Belt and Road" will have a certain impact on China's import and export trade. Therefore, this paper mainly improves from the following points: First, the main starting point of this paper is to study the impact of trade opening on the real effective exchange rate fluctuation of RMB under the action of various shocks. After considering the difference between the trade import and export data of the provinces (autonomous regions and municipalities directly under the Central Government) and the actual price level, the volatility of the real effective exchange rate of RMB shows a similar but not overlapping trend, which is of certain significance for the prevention and study of the effective fluctuation of the RMB real exchange rate. Second, this paper is based on the study of trade opening on the change of industrial structure and the impact of "Belt and Road" initiative on the effective fluctuation of RMB real exchange rate.

3. Connotation and theoretical mechanism of RMB real effective exchange rate

3.1. Connotation of the RMB real effective exchange rate

The real effective exchange rate of RMB mainly refers to the relative price of goods and services between China and other countries. Usually, the effective exchange rate is one of the weighted average exchange rate, most of which takes the proportion of foreign trade as the weight. At the same time, the effective exchange rate is also an important indicator to measure economic development and trade export, and the effective exchange rate is used to measure the international competitiveness of a country's commodity trade. At the same time, the effective exchange rate is also an important indicator to warn the currency crisis of countries, and can also be applied to study the relative comparison between the living standard of a country and the residents of other countries.

Usually, the effective exchange rate is mainly divided into real effective exchange rate and nominal effective exchange rate. A country's nominal effective exchange rate is the weighted average of the bilateral nominal exchange rate of the country's currency and all other trading countries, which is the familiar real effective exchange rate if the impact of inflation is excluded. The real effective exchange rate will not only comprehensively consider all the bilateral nominal exchange

rate changes, but also more comprehensively reflect the external value of the domestic currency.

3.2. Theoretical mechanism

This paper uses the theoretical models of Hau (2000) and Calderon & Kubota (2017) to analyze the impact of trade opening on real effective exchange rate fluctuations[3,8]. An economy consists of the trade and non-trade sectors with price stickiness, and the trade sector sets prices in an open, fully competitive market and has a single homogeneous output. A representative consumer (j) is given a given amount of tradable goods (y_t) during each period. The effect function of the representative consumers is expressed as:

$$U_t^j = \sum_{s=t}^{\infty} \beta^{s-t} \left[\gamma \ln C_{T,s}^j + (1-\gamma) \ln C_{N,s}^j + \frac{X}{1-\varepsilon} \left(\frac{M_s^j}{P_s} \right)^{1-\varepsilon} - \frac{K}{2} y_{N,s}^2 \right] \quad (1)$$

Where, $\beta \in [0,1]$, $K > 0$. T and N represent traded and non-traded goods respectively, C represents consumption, M is the currency held, P is the consumer price index, and y_N is the number of non-traded goods. P is the consumer price index, assuming that the proportion of traded goods is γ , then the consumer price index is expressed as $P = P_T^\gamma P_N^{1-\gamma} / [\gamma^\gamma (1-\gamma)^{1-\gamma}]$. If the law of one price holds for trade goods, then $P_T = EP_T^*$. The P_N is a non-tradable goods price index. The $c_N(z)$, $p_N(z)$ are the consumption and price of non-traded products z,

respectively, so $C_N = \left[\int_0^1 c_N(z) \frac{\theta-1}{\theta} \right]^{\frac{\theta}{\theta-1}}$, $P_N =$

$\left[\int_0^1 p_N(z) \frac{\theta-1}{\theta} \right]^{\frac{\theta}{\theta-1}}$, bonds are denominated in trade goods, r is

the interest rate, $\beta(1+r) = 1$. The budget constraints for representative consumers are expressed as follows:

$$P_{T,t} B_{t+1}^j + M_t^j = P_{T,t} (1+r) B_t^j + M_{t-1}^j + p_{N,t}(j) y_{N,t}(j) + P_{T,t} y_{T,t} - P_{N,t} C_{N,t}^j - P_{T,t} C_{T,t}^j - P_{T,t} \tau_t \quad (2)$$

Among them, τ_t is the per capita tax revenue denominated in traded goods. Considering the government purchase, the demand curve of non-tradable goods producers is expressed as follows:

$$y_N^d + \left[\frac{P_{N,t}(j)}{P_{N,t}} \right]^{-\theta} (C_N^A + G_N^A) \quad (3)$$

Among them, C and G are the total private consumption and the public total consumption of non-traded goods, respectively. Budget constraint maximization formula (1) based on equation (2) and equation (3), as follows:

$$C_{T,t} = C_{T,t+1} \quad (4)$$

$$\frac{y}{C_{T,t}} = X \left(\frac{M_t}{P_t} \right)^{-\varepsilon} \frac{P_{T,t}}{P_t} + \beta \frac{y}{C_{T,t+1}} \frac{P_{T,t}}{P_{T,t+1}} \quad (5)$$

$$\frac{C_{N,t}}{C_{T,t}} = \frac{1-\gamma}{\gamma} \frac{P_{T,t}}{P_{N,t}} \quad (6)$$

$$y_{N,t}^{\frac{\theta+1}{\theta}} = \left[\frac{(\theta-1)(1-\gamma)}{\theta K} \right] C_{N,t}^{-1} (C_N^A + G_N^A)^{\frac{1}{\theta}} \quad (7)$$

Because the trade yield is constant y_T , there is $C_{T,t} = y_T$.

The combined equation (4) and equation (5) are:

$$\frac{M_t}{P_t} = \left[\frac{C_{T,t} P_{T,t}}{Y} / 1 - \beta \frac{P_{T,t}}{P_t} \right]^{\frac{1}{\varepsilon}} \quad (8)$$

3.2.1. Unanticipated and permanent monetary shock

Assuming the occurrence of unexpected permanent monetary shocks, short-term non-trade prices remain sticky long-term monetary neutrality, and the law of one price and then pass equation (8) The short-term changes of the actual exchange rate are as follows: $q = (1 - \lambda) P_T$, then the actual exchange rate fluctuations are:

$$\text{Var}(q) = F_1(\gamma) \text{Var}(M), \ln \text{Var}(q) = \ln F_1(\gamma) + \ln \text{Var}(M) \quad (9)$$

$F_1(\gamma)$ is a reduction function of trade opening γ . Therefore, trade opening can reduce real exchange rate fluctuations under the action of unexpected permanent currency shocks.

3.2.2. Unanticipated and permanent technical shocks

Assuming an unexpected permanent technical impact A_N in the non-trade production sector, the short-term change in the actual exchange rate is: $q = (1 - \lambda) A_N / 2$. The actual exchange rate fluctuations are:

$$\text{Var}(q) = F_2(\gamma) \text{Var}(M), \ln \text{Var}(q) = \ln F_2(\gamma) + \ln \text{Var}(M) \quad (10)$$

$F_2(\gamma)$ is an increasing function of trade opening γ . Therefore, under the unanticipated permanent technical impact, trade opening can reduce the real exchange rate fluctuations.

3.2.3. Unanticipated and permanent financial shocks

Assuming an unanticipated permanent financial shock G , the short-term change in the real exchange rate is: $q = (1 - \lambda) P_T$. Real exchange rate volatility:

$$\text{Var}(q) = F_2(\gamma) \text{Var}(G), \ln \text{Var}(q) = \ln F_2(\gamma) + \ln \text{Var}(G) \quad (11)$$

$F_3(\gamma)$ is a reduction function of trade opening γ . Therefore, trade opening can reduce the real exchange rate fluctuations under the action of unanticipated permanent financial shocks.

4. Measurement Models and Data Sources

4.1. Measurement model setting

Following the practice of Hau (2002), Calderon & Kubota (2017), the measurement model is set as[5,8]:

$$\ln(\text{vol}_{i,t}) = \mu_i + \eta_t + O_{i,t} \Gamma + Z_{i,t} \Theta + \varepsilon_{i,t} \quad (12)$$

Among them, i and t are provinces (autonomous regions, municipalities directly under the Central Government) and time respectively. The vol is the explained variable, considering the RMB real effective exchange rate volatility after the provincial trade and price level data. O is the key explanatory variable, with provincial trade opening. Z is the control variable. μ is the region fixed effect, and η is the time fixed effect. All the variables were affected by removing the price factors through the CPI. All the variables were taken in the log form.

4.2. Selection and description of the variables

The degree of RMB real effective exchange rate (vol): This paper sorts out the quarterly import and export trade data of provinces (autonomous regions, municipalities directly under the Central Government) and other countries from 2006 to 2020, and the real effective exchange rate of RMB after considering the provincial import and export trade data, $Q_{i,t}$ is:

$$Q_{i,t} = P_{i,t} / \left\{ \left(\frac{S_{i,t}}{S_{i,0}} \right) \prod_{k=1}^n \left[\frac{P_{k,t}^*}{S_{k,t}} / \frac{P_{k,0}^*}{S_{k,0}} \right]^{W_k} \right\} \quad (13)$$

Among them, i and t are provincial (autonomous regions, municipalities directly under the Central Government) and quarterly time respectively, k represents the trade target country, s is the nominal exchange rate (RMB / dollar), and P consumer price index. S is the nominal exchange rate (foreign currency / dollar) of the target country, and P^* is the consumer price index of the target country. The real effective exchange rate fluctuation (vol) is the standard deviation between the real effective exchange rate of RMB in two years.

Trade opening (TO). Drawing on the existing literature, the proportion of the total import and export trade in GDP in the same period is used to measure. According to the practice of Patrick et al. (1998), the trade opening of the provinces (autonomous regions, municipalities directly under the Central Government) is corrected as follows[20]:

$$\ln(\text{TO}_{i,t}) = \beta_0 + \beta_1 \ln(\text{GDP}_{i,t}) + \beta_2 [\ln(\text{GDP}_{i,t})]^2 + \beta_3 \ln(\text{pop}_{i,t}) + \beta_4 [\ln(\text{pergdp}_{i,t})]^2 + \varepsilon_{i,t} \quad (14)$$

Among them, pop is the population, pergdp per capita actual GDP, GDP is the actual GDP of provinces (autonomous regions, municipalities directly under the Central Government). In this paper, the fitting value of Equation (13) regression is taken as the robust index of provincial trade opening (TO).

The control variables include: monetary shock, fiscal shock, technological impact, real GDP per capita (pergdp), inflation rate, industrial structure index, "One Belt and One Road" virtual variable rb and other variables.

Fiscal shock (fiscal). Referring to the practice of Fatas & Mihov (2013), the actual government general fiscal expenditure (G) regresses the economic growth rate (Y), the actual government consumption expenditure ($G_{i,t-1}$), the inflation rate (cpi), the inflation rate and the time trend term[14]. The provincial financial shock is measured by the standard deviation of the regression residual ($\varepsilon_{i,t}$) in the next two years.

$$\ln(G_{i,t}) = \alpha_0 + \eta_t + \beta_1 \ln(G_{i,t-1}) + \beta_2 \ln(Y_{i,t}) + \beta_3 \ln(\text{cpi}_{i,t}) + \beta_4 [\ln(\text{cpi}_{i,t})]^2 + \varepsilon_{i,t} \quad (15)$$

Currency shock (money). Similar to the construction of financial shock, national M2 was used to replace M2 in provinces (autonomous regions and municipalities directly under the Central Government) as the explained variable. The monetary shock is equal to the regression residual adjacent two-year standard deviation.

Technical shock (tfp). Drawing on the calculation method

of Solo residuals, the total factor productivity calculated by the actual output of the provinces (autonomous regions, municipalities directly under the Central Government) and calculate the quarterly change. Technical impact is measured by the standard deviation of the annual change of total factor productivity in provinces (autonomous regions and municipalities directly under the Central Government in the next two years).

The study object of this paper is 31 provinces (autonomous regions, municipalities directly under the Central Government), combined with data availability, the study time is the data of each quarter from 2006 to 2020.

5. Empirical Analysis

5.1. Data source and statistical descriptions

This paper selects the quarterly data from 2006 to 2020,

Table 1. Summary Statistics: This Table reports descriptive statistics of variables used in our baseline regression, including dependent, independent, and control variables.

	Mean	Max	Min	Std. Dev.	Obs
GDP	12301.1	111151.6	64.1	14176.43	1736
PerGDP	21330.2	118074.4	1185.89	17172.98	1736
CPI	127.34	169.62	102.4	13.37	1736
Real effective exchange rate	4.73	5.29	4.40	0.14	1736
Trade fit value	1.97	7.24	-0.68	1.31	1736
Financial shock	0.052	0.429	0.000	0.057	1736
Currency shock	0.005	0.028	0.000	0.005	1736
Technical shock	0.344	0.891	0.000	0.216	1736

5.2. Empirical test

The regression equations were analyzed directly with the explained variables and the added control variables, and the

and the data are mainly obtained from the National Bureau of Statistics, the website of the Ministry of Finance and the Wind database. Considering the inflation factors, the nominal variable data for the consumer price index (CPI) adjust the actual value of the variables, the CPI has 2006, because the standard deviation of the residual calculation, the index data since 2007, can be seen from the table in the actual effective exchange rate fluctuations in provincial annual fluctuations, and the difference between the provincial trade exports. The descriptive statistical results of each variable are shown in Table 1, and the average value of the fitted value (logarithm) of trade opening is 1.97, and the fiscal and monetary shocks are positive and short-term technical shocks are negative, in line with the theoretical expectation, and the mean value is 0.052, 0.005 and 0.344, respectively.

original values were analyzed simultaneously with the fitted values. Selection fixed effects were tested by hausman test (68.87 in chi2), and the regression results are shown in Table 2:

Table 2. This table reports the panel regression results of the trade opening on the real effective exchange rate of RMB. *, ** and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

	Univariate regression		Multivariable regression	
	original	fitted	original	fitted
Trade fit value	-0.014*** (-8.44)	-0.054*** (-16.61)	-0.001 (-1.23)	-0.012*** (-3.75)
Financial shock			0.005 (0.17)	0.008 (0.26)
Currency shock			1.022*** (3.05)	1.080*** (3.24)
Technical shock			-0.047*** (-5.83)	-0.046*** (-5.75)
PerGDP			0.000** (2.28)	-0.000 (-1.19)
CPI			0.009*** (63.94)	0.009*** (62.70)
Province	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
N	1736	1736	1736	1736

As shown according to the benchmark regression results shown in Table 2. The trade opening index of the real effective exchange rate fluctuation of RMB after excluding the price level data are significantly negative, indicating that the degree of trade opening can effectively restrain the real effective exchange rate fluctuation of RMB after considering the provincial data. According to the analysis of the theoretical model, under the influence of different influencing factors such as fiscal shock, monetary shock and

technological shock, the trade opening can also restrain the fluctuation of China's actual effective exchange rate. Therefore, the control variables such as fiscal shock, monetary shock and technical shock are added to the regression equation for regression analysis again. After controlling for related impact variables, the results of trade opening (TO) were -0.003 and -0.013, which were significantly negative, which also indicates that the trade opening of provinces (autonomous regions and municipalities

directly under the Central Government) can effectively restrain the real effective exchange rate fluctuations of RMB. At the same time, it is also shown in the regression equation that the shocks of monetary, fiscal and technological exchange rate are also significantly positive for the fluctuation of the effective exchange rate of RMB, which also shows that the shocks of fiscal and monetary exchange rate will aggravate the fluctuation of the effective exchange rate of RMB, while the impact of technological progress will reduce the fluctuation of the effective exchange rate of RMB.

5.3. Additional analysis

As China's economy enters the new normal, the change of

Table 3. This table reports the impact of the indicator of trade openness with an advanced industrial structure on the fluctuation of the RMB real effective exchange rate. *, ** and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

	Advanced industrial structure			
	original		fitted	
	coefficient	t value	coefficient	t value
Trade fit value	-0.001*	-1.65	-0.024***	-5.33
Interactive	-0.017***	-7.60	-0.023***	-9.28
Control	Yes	Yes	Yes	Yes
Province	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
N	1736	1736	1736	1736

The index of trade opening is significantly negative, which shows that trade opening can effectively restrain the fluctuation of the real effective exchange rate of RMB. Based on the industrial structure of the index (interaction) open the influence of the actual effective exchange rate fluctuations can be found, open trade and industrial structure height the interaction is also significantly negative, that the height of the industrial structure can make trade open on the actual effective exchange rate fluctuations have certain inhibition and buffer effect. The rationalization of industrial structure can restrain the trade opening and have a significant effect on the fluctuation of the real effective exchange rate of RMB. The possible reason may be that the high degree of industrial structure reflects the resistance of an economy to external shocks. The secondary industry is mainly the industrial manufacturing industry, which is greatly affected by the international and domestic trade production, and its ability to resist external shocks is weak. The tertiary industry is mainly the service industry and the high-end industry. The increasing proportion of the tertiary industry also shows that the economy relies on the high-end intelligent service industry and has a strong ability to resist external shocks. Therefore, the increasing industrial structure of a country can effectively alleviate the impact on economic development, and also

China's industrial structure and the development of "Belt and Road" will also have a certain impact on the trade objects of provinces and cities, and then affect the scale and output of import and export trade of provinces and cities to achieve the impact on the real effective exchange rate fluctuation of RMB.

5.3.1. Upgrading of an industrial structure

The interaction term of trade opening and industrial structure index is introduced for regression. The industrial structure index is expressed as the ratio of the tertiary industry and the secondary industry in each province. The regression results through fixed effects and control variables are shown in Table 3.

reflects the slowing effect of enhancing the openness of trade on the fluctuation of the real effective exchange rate of RMB.

5.3.2. Promotion and development of "Belt and Road"

This paper studies the impact of development on different provincial trade by using the double difference method (DID). To be able to use the double difference method, we need to determine the time of policy implementation as a dummy variable versus whether the province participated in the "Belt and Road" policy as a dummy variable. Therefore, we set a time virtual variable t advocated by "Belt and Road". By reviewing the relevant literature, we took 0 before 2014; and 1 for 2014 and later. Referring to the model method in Cao Wei et al. (2019), the ratio of import and export trade volume between provinces and cities and countries along the "Belt and Road" to that in the same period is used as the agent index to measure the influence of "Belt and Road" promotion and policy implementation of provinces and cities. In order to ensure the robustness of the regression results, this paper divides the median proportion of trade between provinces and cities and countries along the "Belt and Road". If the median is above 1, and the following is 0 to indicate whether the policy is implemented [15].

Table 4. This table reports the results of the difference-in-difference method on the impact of development promoted by the Belt and Road Initiative on trade at different provincial levels. *, ** and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

	original		fitted	
	coefficient	t value	coefficient	t value
Trade fit value	-0.001	-1.07	-0.016***	-3.84
dum	0.003	-0.27	-0.002	-0.17
did	-0.016**	-2.56	0.012**	2.52
Control	Yes	Yes	Yes	Yes
Province	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
N	1736	1736	1736	1736

As shown in table 3, open trade is consistent with the above model is significantly negative, time virtual variables and provinces and cities affected by the "Belt and Road" advocate development policy of virtual variable interaction value of the regression coefficient is significantly positive, this shows that the development of "Belt and Road" the international policy for various provinces and cities of import and export trade fluctuations will increase significantly, so as to achieve the actual effective exchange rate fluctuations will be increased. Taking the regression results of the trade proportion of provinces and cities and the Belt and Road countries as the median point as the fitting value of virtual policy variables as an example, compared with the promotion and development of "Belt and Road", the real effective exchange rate fluctuation of RMB increased by 1.169%.

6. Conclusion

6.1. Conclusion summary

First, this paper borrowed Hau (2000) and Calderon & Kubota (2017) of the theoretical model of trade open influence on the actual effective exchange rate fluctuations found that for the construction of currency impact, technical impact and financial impact technical indicators, the provincial trade opening can effectively reduce the fluctuation of RMB actual effective exchange rate, and the model of robust analysis, under such conditions, the original trade opening and the fitting trade opening can significantly reduce the fluctuation of RMB effective exchange rate [3,8]. Secondly, this paper examines the fluctuation rate of the RMB real effective exchange rate at the provincial level, including the influence of the total index and detailed index of trade opening on the real effective exchange rate fluctuation of RMB under the trade level of each province. Finally, this paper discusses how the change of industrial structure and what the promotion and development of "Belt and Road" will have on the real effective exchange rate of RMB. The results of the empirical research can be obtained as follows: First, under the construction indicators of monetary shock, technological shock and fiscal shock, trade opening can effectively restrain or slow down the fluctuation of the real effective exchange rate of RMB. Second, the provinces and cities of the industrial structure of the more reasonable, open trade for refinement for the provincial trade level and eliminate under the influence of the price level for the actual effective exchange rate fluctuations slow inhibition will be more enlarged, based on the trade opening and industry highly reasonable interaction significantly negative can be more open trade for the actual effective exchange rate fluctuations have slow inhibition. Third, With the promotion and development of "Belt and Road", the real effective exchange rate fluctuation of RMB has certain uncertainty, In the light of the actual trade opening-up, The promotion and development of "Belt and Road" intensified the fluctuation of the real effective exchange rate, Perhaps due to the promotion and development of "Belt and Road", China's import and export trade of primary products of countries along the "Belt and Road" has increased, However, the relative decrease of the import and export trade of capital, technology and other products leads to the actual trade opening, The promotion and development of "Belt and Road" intensified the fluctuation of the real effective exchange rate, It is also possible that this is due to reasons outside the system such as the epidemic

economy, However, the fitted value of trade opening shows that trade opening has a slowing effect on the fluctuation of the real effective exchange rate of RMB, More as expected by the model than the original data fit values, It may greatly reduce the impact of external factors on the real effective exchange rate of RMB.

In general, with the internationalization of economy and trade, trade development, industrial structure highly rationalization and for the implementation of "Belt and Road" policy, the provincial trade openness expanding economic industry resources rationalization, these cases of the actual effective exchange rate fluctuations will be reduced, in order to promote the virtuous cycle of economic and trade.

6.2. Policy proposal

With the development of international economy and trade, China has initially formed a relatively mature overseas market for goods trade services, and at the same time has established a corresponding supervision system and the adjustment mechanism of continuous optimization of RMB exchange rate. However, we can also see that with China's deepening of international trade, China's real effective exchange rate of RMB is also facing new challenges. In the long run, China still needs to continuously improve the adjustment mechanism of the RMB real exchange rate, continuously rationally allocate and guide the resource services in the trade market activities, and promote the stable and healthy development of the import and export trade markets in all provinces and cities. Based on the research conclusion of this paper, this paper puts forward the corresponding policy suggestions:

First of all, all provinces and cities should continue to adhere to the policy of opening up trade services and maintain very close trade exchanges with other countries and neighboring countries. The most important is to increase high-end intelligent service industry research and development, strengthen small and medium-sized foreign trade enterprises science and technology innovation, will be more factors of production gradually shift from primary, labor-intensive products to high-end industry development, through continuous rationalization of industry and capital intensive products trade, it will effectively reduce the actual effective exchange rate fluctuations, promote the steady growth of economy and trade. Second, with the steady progress of the "Belt and Road" policy, the import and export trade is of great significance to China's development and development under the background of China's continuous overcapacity, and at the same time, it cannot ignore the reality of the RMB. Under the influence of effective exchange rate fluctuations, under the background of increasing foreign trade and investment, China should also change the import and export trade of industrial structure, from labor-intensive import and export to high-end capital-intensive import and export, and promote the continuous development of the double cycle of domestic countries. Third, we will improve and deepen supply-side structural reform and promote the optimization and upgrading of the industrial structure. We will transform the mode of economic development, change the production mode of products, upgrade the traditional manufacturing industry, promote competition for export products under the guidance of innovation-driven strategies, and promote the upgrading and optimization of the export product mix.

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