

The Impact of Exchange Rate Adjustment on the Macro Economy under the Open Economy DSGE Model

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Abstract: The adjustment of RMB exchange rate will have an important impact on China's economic development. Based on the brief introduction of the concept and characteristics of the DSGE model, this paper analyzes and expounds the impact of RMB exchange rate adjustment on the national macro-economy based on the DSGE model, and gives relevant suggestions for monetary policy that can promote the country's macroeconomic development.

In the more than ten years since the beginning of the reform of the RMB exchange rate mechanism in 2005, scholars at home and abroad have conducted in-depth discussions on issues related to the adjustment of the RMB exchange rate. The RMB exchange rate is an important policy tool and has an adjustment function for the national macro economy. Under the open economy, the marketization of the RMB exchange rate has been further promoted, and what kind of impact will this kind of promotion have on China's macro-economy? Under the influence of the RMB exchange rate, the state should introduce appropriate monetary policies to promote macroeconomics. Economic development is a concern of scholars. In this context, this paper analyzes and explains the impact of RMB exchange rate adjustment on the national macro economy based on the DSGE model.

1. DSGE model

1.1 Introduction to DSGE Model

A dynamic stochastic equilibrium model, referred to as the DSGE model. This model is based on macro and microeconomic theory. In the study, the behavioral equations of households, vendors, etc. under the assumption of maximizing household utility and maximizing the profit of manufacturers through dynamic optimization methods. Conduct an investigation^[1]. Each behavioral entity must analyze its current and future follow-up impacts on its decision-making behavior. Given the many uncertainties in current real economic development, the DSGE model introduces various exogenous random shock factors to study the effects of these random factors. Under the interaction and influence between various actors.

1.2 DSGE model features

The DSGE model has the following characteristics[2]: (1) Dynamic: The so-called dynamic refers to the economic individual considering the optimal choice across the range, and the DSGE model can change the various variables in the economic system over time. The trend of change occurred was deduced. (2) Randomness: Random refers to the impact of the economic system on the impact of many different exogenous random factors in development. For example, preference shocks, monetary policy shocks, technical shocks, and so on. (3) General Equilibrium: General Equilibrium refers to governments, consumers, manufacturers, central banks, etc., all of which are participants in the macroeconomic system. The state needs to make an expected deduction of future economic development for each participant's preferences. The sum of the best choices.

2. The impact of exchange rate adjustment on the macro economy under the open economy DSGE model

2.1 Marketization of RMB exchange rate

The exchange rate refers to the conversion of one country's currency in another country's currency and the other country's currency price. The marketization of the RMB exchange rate refers to the full emphasis on the role of the market mechanism in the adjustment of the RMB exchange rate, so that the RMB exchange rate is determined through the market supply and demand relationship. The People's Bank of China announced that since July 21, 2005, the exchange rate fluctuations have been adjusted and managed according to market supply and demand and the RMB exchange rate mechanism has become more flexible since then. On August 11, 2015, the People's Bank of China announced another policy to adjust the RMB exchange rate mid-price. It would have to ask for an inquiry from the foreign exchange market between banks and weigh the inter-bank quotation to obtain an intermediate price. There are also major currency changes in foreign exchange supply and demand. The intermediate price of the RMB is formulated with reference to the previous day's closing exchange rate between banks.^[3]

2.2 The macroeconomic impact of exchange rate adjustment under the open economy DSGE model

The adjustment of the RMB exchange rate and the marketization of the exchange rate have both positive and negative impacts on the national macro economy.

(1) Positive impact

First, affecting import and export trade

Under the DSGE model, assuming that other factors remain unchanged, if the country's currency depreciates, the country's commodity prices will increase significantly, making a country's export trade effectively promoted. If the national currency appreciates, it will be more conducive to the country's import trade.

Given that the prices of export commodities are also flexible, the impact of RMB exchange rate adjustment on import and export trade needs further detailed consideration. Assuming that the supply elasticity of commodities is infinite, the import elasticity of commodities will be > 1 , and the exchange rate adjustment will have a good effect on the domestic trade balance. In economic research, we need to pay attention to the impact of exchange rate adjustment on import and export trade, and analyze the impact of RMB exchange rate change on the price change of export commodities. In view of the potential lag of the model analysis results, the model can be refined and perfected through the monthly model, so as to understand the real impact of exchange rate fluctuations on the import and export trade. China's imported raw materials such as oil and steel are more sensitive and obvious to the impact of the RMB exchange rate adjustment.

It can be seen from the above analysis that RMB exchange rate adjustment has a significant impact on import and export trade. After RMB appreciation, domestic enterprises can obtain more US dollars through commodity import or RMB exchange, and can buy more products with the same amount of US dollars. At this time, the production cost of enterprises is significantly reduced, which can promote the development of enterprises. It can be said that RMB exchange rate adjustment can improve the terms of China's import and export trade and increase the national economy.

Secondly, affects economic integrity

From the perspective of traditional economics, the impact of exchange rate adjustment on the economy is analyzed. The appreciation of RMB will affect the balance of national income and expenditure, and then the balance of import and export trade. In addition, the change of RMB exchange rate adjustment will also affect the change of relative price and lead to the change of domestic commodity price level. If the appreciation of RMB reaches 15% at one time, the price index of domestic consumers will rise by 0.03% (compared with the price benchmark) in the short term, and the year-on-year growth rate of GDP will decline by 4.68%. After a period of development, the national GDP growth rate will be 2.26% higher than the benchmark, reaching a

maximum, and the GDP growth rate will become normal only after a long period of development^[4-5]. Through DSGE model, the fierce effect of imports and the impact of exports can be analyzed in a balanced way, and the contribution rate of the two to national GDP can be neutralized, and the comprehensive and overall contribution rate of imports and exports to national GDP can be obtained. Therefore, even if the international trade balance is in deficit, it can make a certain contribution to GDP. For example, if the appreciation of RMB is 10%, the price elasticity of import is 2 and that of export is -1. When the RMB exchange rate changes to the relative value, other conditions remain unchanged. In this case, the direction change of the balance of payments deficit is 10%. If the foreign trade multiplier is 1, the national GDP will be reduced by 10%. However, if we analyze the overall contribution rate of import and export trade to national GDP, it will be positive. Therefore, to analyze the impact of exchange rate adjustment on national GDP needs to be analyzed from multiple perspectives.

Thirdly, affects foreign exchange reserves and commodity imports

If the country's foreign exchange reserves increase, then the country will have to assume greater exchange rate risk. China holds a large amount of US treasury bonds, and the US dollar accounts for the majority of China's foreign exchange reserves. From the perspective of hard currency, China's foreign exchange reserves are potential losses. However, if the appreciation rate of RMB reaches 15% during this process, the loss caused by us dollar foreign exchange reserve will be effectively restrained^[6]. Given that China's foreign exchange reserves have been increasing year by year in recent years, the loss of flow can be said to be heavier and heavier, but in fact these losses are only losses on the book. If China keeps holding dollar assets, it will not cause actual losses in fact because of the possibility of re-appreciation of the dollar. In the management of foreign exchange reserve assets, it is not the ultimate goal of the country to ensure the profitability of its investment portfolio. China's bulk commodity imports are mainly steel and crude oil, which will cost tens of billions of us dollars each year. If RMB appreciates, the import expenses of these two raw materials will save billions of us dollars. It can be seen that the exchange rate adjustment plays a positive role in China's bulk commodity imports.

2.2.2 Negative impact

First, it affects financial market stability. If the RMB appreciates for a long time, a large amount of international hot money will continuously flow into China's financial market, especially the stock market and the real estate market. Due to the large scale of hot money, good convergence and strong liquidity, it has caused a huge impact on China's financial market.

The current financial market of China is still relatively hysteretic in development, the regulatory system is imperfect, and excessive speculative international hot money will cause a housing market bubble and undermine the financial market.

Second, reduce profit margins. The appreciation of the RMB, with the assistance of national policies, will promote the transformation of enterprises after a certain period of time. In the short-term, a large number of export enterprises will use their price advantage to improve their international competitiveness under the cheap productivity after the appreciation of the RMB. With the continuous influx of foreign capital, the scale of exports will continue to increase, and the national employment rate will continue to rise^[7]. However, if the RMB continues to appreciate, the continued rise in export prices will offset the price advantage of cheap labor, and the export volume will decrease due to competitive pressure and the profit rate will decrease. At this time, foreign businessmen will also reduce the scale due to small returns, which will cause export enterprises to face a crisis of survival and reduce the employment rate.

Third, it leads to the depreciation of foreign exchange assets. China's foreign exchange reserves rank first in the world, and the share of US dollars in foreign exchange reserves exceeds 60%. At the same time, China is the country with the largest number of US Treasury bonds. If the RMB continues to appreciate, these foreign exchange assets will depreciate, reducing the real value of foreign exchange assets, affecting the foreign exchange system and the stability of monetary policy.

3. The thinking of the current adjustment of RMB exchange rate

Through the above analysis, we can know that the impact of exchange rate adjustment on China's macro-economy has both positive and negative effects. Exchange rate appreciation is a double-edged sword. In economic development, it is necessary to make full use of favorable factors and improve unfavorable factors. To play a better role in promoting economic development, the author believes that the following countermeasures should be made:

3.1 Guide industry transformation through policies

The government should introduce relevant guiding policies, guide the smooth transformation of small and medium-sized export enterprises through the policy, enable enterprises to change the operating mechanism under independent innovation, and increase the added value of processing trade, thus resisting the risk of exchange rate changes, and achieving the lower limit of the rule of the survival of the fittest market. Upgrade of industrial structure.

3.2 Reasonable control over foreign capital inflows

A large amount of foreign capital will flow in favor of China's industrial transformation, which is conducive to the improvement of China's trade structure. Therefore, it is necessary to encourage foreign capital inflows and control foreign capital inflows. Encourage the use of foreign capital to accelerate industrial upgrading and stabilize the employment situation; it is necessary to strictly guard against "hot money"; only this can make China's financial supervision continue to improve, so that China's financial market will not be turbulent.

3.3 Improving the trade structure

The government should expand the use of exchange rate appreciation to expand trade scope, introduce more basic energy and high technology, and reduce the export in value-added products. It should also continuously expand trade channels, improve trade structure, reduce US dollar reserves, increase exchange rate and strengthen national debt and foreign exchange assets for a long time, and ensure Foreign exchange assets can be preserved for a long time^[8].

In summary, the impact of RMB exchange rate adjustment on China's macro economy is two-sided, but the negative impact is very limited, and the government can properly intervene through policy measures. In the economic development, the DSGE model should be given to comprehensively analyze the impact of exchange rate adjustment, and based on the analysis, formulate monetary policy that is more conducive to China's economic development.

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