Journal of http://www.satursonpublishing.com/
Research in Multidisciplinary Methods and Applications
ISSN: 2957-3920

Volume 2, Issue 2, February 2023

The RMB Exchange Rate Transmission Mechanism of The Fed's Interest Rate Hike and Its Impact on China's Economy

Li Yijin

Central University of Finance and Economics, No. 39 South Xuexue Road, Haidian District, Beijing, 100081

Abstract: Under the background of the Federal Reserve Bank of the United States interest rate hike, this paper analyzes with the help of exchange rate overshoot model and interest rate parity theory, explains the change of the Fed's interest rate hike to transmit the depreciation and then appreciation of the RMB exchange rate, and answers the impact of exchange rate changes on China's economy and the impact of interest rate hikes on China's commodities, debt solvency, and real estate enterprises, and at the same time uses the theory of trilemma to explain the impact of interest rate hikes on China's benchmark interest rates. Based on this, this paper proposes to maintain the steady decline of the RMB in the short term, promote the internationalization process of the RMB, deepen China's supply-side structural reform, and develop China's economy.

Keywords: Fed Interest Rate Hike, RMB Exchange Rate, Chinese Macroeconomy

1 Introduction

Since 2022, affected by the new crown epidemic stimulated the economy and other factors, as the world's largest economy, the overheated economy of the United States indicates that it has entered a state of high inflation, in order to curb unstable high-speed inflation, the Federal Reserve stopped quantitative easing policy and began to raise interest rates, six rounds of interest rate hikes to the economies of the world to bring severe impact and impact, countries share the economic impact of the United States, this article will analyze from two perspectives of China's macroeconomy and RMB exchange rate affected by interest rate hikes. And proposed relevant measures to deal with the Fed's interest rate hike.

2 Impact On The RMB Exchange Rate

2.1 The Interest Rate Parity Theory And Exchange Rate Overshoot Model Analyze The Transmission Mechanism Of The Fed's Interest Rate Hike To The RMB Exchange Rate

The figure below analyzes the transmission mechanism of changes in US dollar interest rates on changes in RMB exchange rates from the perspective of the US money market, and uses interest rate parity as the basis for analyzing its changes, which assumes that prices are sticky in the short term and can be volatile in the long term, and the real total output of the United States before and after the interest rate hike remains unchanged.

Journal of http://www.satursonpublishing.com/
Research in Multidisciplinary Methods and Applications
ISSN: 2957-3920

Volume 2, Issue 2, February 2023

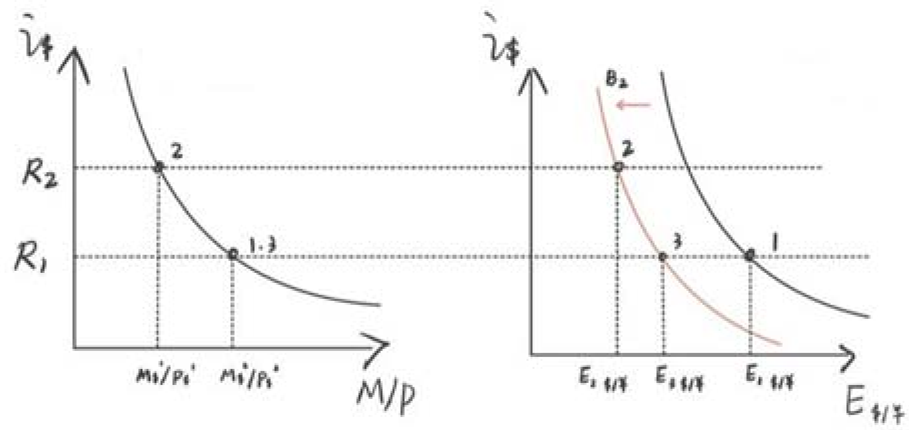

FIGURE 1 THE IMPACT OF CHANGES IN US DOLLAR INTEREST RATES ON THE RMB EXCHANGE RATE

First, analyzing the short-term adjustment process, the Fed's interest rate hike has caused the US interest rate $R_1$to rise to, and $R_2$the increase in interest rate means that the cost of holding money increases, and the real money demand in the US money market decreases. According to the formula:

$$FR: \ i = i^* + \frac{E^e - E}{E} \tag{1}$$

$$E^e = \frac{P}{P^*} \tag{2}$$

The decrease in demand for money makes the public expect a permanent decline in price P, that is, a reduction, investors expect the US dollar spot exchange rate to appreciate, the E^e equilibrium interest rate changes $E^1_{\$/\text{¥}}$ from to , and the reduction $E^2_{\$/\text{¥}}$makes the reduction, the yield on RMB deposits E^ein US dollars is relatively reduced, and the yield on RMB deposits shifts to the left, from $i$translation toB_1 B_2。

Secondly, analyze the long-term adjustment process, when the price is sticky, the central bank will ensure that the total money supply is the initial supply, and the real money demand returns to the initial level, because assuming that the real output level before and after the US interest rate hike remains unchanged, so the equilibrium interest rate R_2returns from the return toR_1. In the world financial market, due to the decline in long-term dollar interest rates, the relative appreciation of the RMB, the public expectations have changed, the RMB deposit yield curve is still the same, $B_2$the RMB deposit income line moves to the long-term equilibrium point until the US dollar interest rate returns to the original level, and the US dollar exchange rate is expected to depreciate due to the return of interest rates.$E^2_{\$/\text{¥}}$ $E^3_{\$/\text{¥}}$

Overall, the Fed's interest rate hike shows an overshoot of the exchange rate. This situation can also be explained by the theory of interest rate parity. According to the equation:

$$1 + i_\$ = \frac{E^{t+1}_{\frac{\$}{\text{¥}}}}{E_{\frac{\$}{\text{¥}}}} \ (1 + i_{\text{¥}}) \tag{3}$$

When the Fed raises interest rates, $i_\$$it rises, in order to maintain the equation, the dollar must appreciate, that is, fall$E^{t+1}_{\frac{\$}{\text{¥}}}$, and people's expectations of the appreciation of the dollar make the spot exchange rate also fall, short-term price $E_{\frac{\$}{\text{¥}}}$stickiness, only long-term price changes cause the dollar interest rate to fall back when $R_1$the RMB interest rate begins to change, therefore, only $i_{\text{¥}}$when unchanged$E_{\frac{\$}{\text{¥}}}$ The decline is more than $E^{t+1}_{\frac{\$}{\text{¥}}}$that, that is, when the spot exchange rate changes more than the expected exchange rate, it will continue to maintain equality, which intuitively shows the above-mentioned exchange rate overshoot.

All in all, for the RMB exchange rate, the initial sharp fluctuation of the US dollar will be greater than the subsequent changes, and the depreciation of the RMB effectively alleviates the pressure of its previous appreciation, but the sharp fluctuation of the exchange rate ratio from 6.3 to 7.3 in the short term is still easy to cause market turmoil, in the "herd effect" Under the influence, economic interference factors are amplified, causing shocks in the stock and bond markets. As far as foreign capital flows are concerned, most of the short-term international outflows of capital are arbitrage funds, due to the potential of Chinese investment projects, China's capital chain will remain stable in the long run, and foreign capital will continue to flow into Chinese investment projects.

2.2 *THE IMPACT OF RMB EXCHANGE RATE FLUCTUATIONS*

According to the current RMB exchange rate quotation mechanism: median price = previous closing price + a basket of currency exchange rate changes + countercyclical factors, the biggest source of pressure on the weak RMB is now The US dollar in a basket of currencies, the US dollar index continues to rise, causing instability in financial markets. According to the data, the total interest rate hike of the US dollar in 2022 will reach 4.25%-4.5%, and the remaining room for interest rate hikes will be greatly reduced, and if interest rate hikes continue, the US economy will be unbearable. As of October 3, 2022, the US Treasury debt has reached $31.1 trillion, the US dollar index

Journal of http://www.satursonpublishing.com/
Research in Multidisciplinary Methods and Applications
ISSN: 2957-3920

Volume 2, Issue 2, February 2023

has limited room for future growth, and the pressure on the Chinese economy is also within the expected range.

The weakness of the RMB exchange rate will also be good for the domestic economy, for the industrial supply chain, affected by the Fed's interest rate hike and the conflict between Russia and Ukraine, the world has entered a period of high interest rate and high chain inflation, the supply of energy and raw materials is unstable, the price is at a high level, and the impact on the industrial chain of developed countries is negative, compared with the opposite, China's energy supply is sufficient and varied The low price of raw materials and the low interest rate level give China's industrial chain sufficient competitiveness and attract a large number of high-quality capital to invest in China. Data show that in the first 8 months of 2022, the EU, Britain, Germany, Japan, South Korea and other investment in China have increased significantly year-on-year, with growth rates ranging from 17.2% ~ 123.7%, promoting the acceleration of international high-quality capital into China.

3 Impact On China's Macroeconomy

Since 2022, the world economic pattern has changed rapidly, the endogenous growth momentum of the economy is insufficient, the growth rate has continued to decline, global inflation is at a high level, and the Federal Reserve has begun six rounds of tightening monetary policy with interest rate hikes, raising interest rates by 25% in March and May bps and, 50 bps each, 75 bps each for 6, 7, 9, November rate hikes, A total of 3.75% was raised, raising the target for the federal funds rate to 4.25%-4.50%. , injecting endogenous impetus into the dollar, intensifying international financial risks, affecting all aspects of China's economy, the weakness of the real estate industry drags down the economic market, commodity price cuts bring tightening risks, the weakening of private sector consumer investment, the dollar's high interest rate and strong exchange rate two-pronged, domestic and foreign Richard narrows, domestic capital outflow continues to have an impact on China's financial stability, the next section will analyze China's macro economy affected by the Fed's interest rate hike from all aspects.

3.1 Impact On Commodities

Commodities are mostly denominated in US dollars, the Fed's interest rate hike will make the US dollar expected to appreciate, coupled with the continued downturn in the global economic market, dollar-denominated commodities will face downward pressure, and the prices of oil, raw materials and metals have declined. For China, China's inflation level is not high, the direct impact of commodity prices is that imported inflationary pressure is significantly reduced, although the market supply of energy suppliers such as Russia has recently appeared uncertainty, but China's grain, oil and coal stocks are stable, supply policy to maintain price stability, producer price index growth is expected to fall, is likely to increase the risk of imported deflation.

3.2 Increased Pressure On External Debt Repayment Threatens Real Estate Enterprises

Previously, the United States continued to adopt quantitative easing policy, the dollar once depreciated, the RMB exchange rate was firm, greatly appreciated, exchange US dollars for international trade is conducive to cost reduction, China issued a large number of dollar-denominated debt, into a large number of dollar funds. Now that the US dollar exchange rate is rising, the debt burden of enterprises is increasing, the huge debt repayment pressure will hit the vitality of enterprises, the central bank has no choice but to bail out, maintain market stability, and will consume a large amount of foreign exchange reserves, and the treasury foreign exchange will be under pressure in stages.

Real estate as a highly leveraged industry, there is a large number of foreign debt or local currency loans, interest rate hikes for the integrity of the real estate capital chain poses a challenge, the Fed's strong tightening monetary policy causes RMB depreciation, a large amount of capital outflow, reduce the inventory funds and loanable funds of real estate enterprises, is likely to cause the solvency of real estate enterprises to decline, the capital chain is broken, and the entire industry is bearish.

3.3 Use The Trilemma To Analyze The Impact Of Interest Rate Hikes On Interest Rates

According to the triadic paradox, the three goals of monetary policy independence, exchange rate stability, and free capital flow cannot be achieved at the same time, and only the trade-off between the goals can be made, and at least one goal can be abandoned. When the Fed keeps raising interest rates: by formula

$$1+i_{\$}=\frac{E^{t+1}_{\frac{\$}{¥}}}{E_{\frac{\$}{¥}}}(1+i_{¥}) \tag{4}$$

The goal of maintaining the free flow of capital, that is, the left and right equations are established, in order to achieve the goal of maintaining exchange rate stability, i.e. $E^{t+1}_{\frac{\$}{¥}}=E_{\frac{\$}{¥}}$, then it must eventually lead to $i_{\$}=i_{¥}$, that is, China loses the independence of monetary policy, and interest rates follow other countries to change. In the real economic situation, that is, China loses some independence to balance the external balance, the US interest rate hike will affect the behavior of the People's Bank of China, forcing the central bank to guide the increase in the interest rate level in the domestic currency market through a series of macro policy manipulation tools, that is, the RMB may also enter the interest rate hike cycle. China's monetary policy prioritizes the vitality of China's real economy, so when the market signals the Fed to raise interest rates, some interest rates in China begin to be regulated to stabilize China's financial market and indirect financing market.

Journal of http://www.satursonpublishing.com/
Research in Multidisciplinary Methods and Applications
ISSN: 2957-3920
Volume 2, Issue 2, February 2023

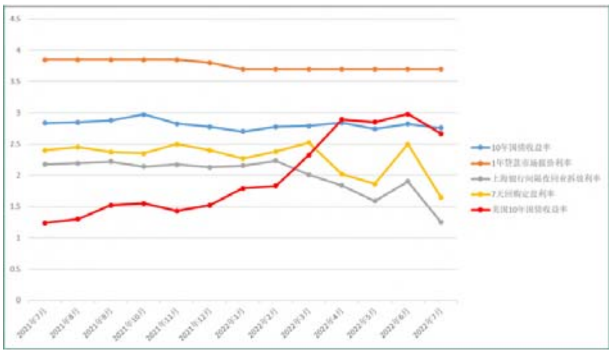

FIGURE 2 COMPARISON OF RELEVANT INTEREST RATES BETWEEN CHINA AND THE UNITED STATES

The figure above is a curve of China's relevant interest rates with the United States during the Fed's interest rate hike from 2021 to 2022, and it can be seen from the figure that China's 10-year Treasury bond yield has a weak correlation with the US 10-year Treasury bond yield, at 3 U.S. Treasury yields rose in April and June, and fell in May and July. That is, after the Fed raised interest rates, capital returned to the United States, causing the price of Chinese government bonds to fall and government bond yields to rise. As for China's 1-year loan market quotation rate, the market had anticipated this behavior long before the Fed raised interest rates, so the central bank lowered the LPR interest rate in January 2022 to replenish funds to the real economy and reduce small and medium-sized enterprises The difficulty of financing micro-enterprises, easing the pressure of small and medium-sized enterprises, and ensuring the smooth operation of the national economy. And Shibor continued to fall in the 3 months of the Fed's interest rate hike, and did not fluctuate in the same direction as the US benchmark interest rate, not in the same direction as in the previous analysis, indicating that China does not want China's lending market to be led by the nose of US interest rates, and takes the initiative to adopt a series of open market operation methods to stabilize the currency market expectations and release liquidity to the market. Guarantee the bank's normal loan profits and operating activities.

On the whole, China's interest rate market is affected by the central bank's first-hand regulation and market expectations internally, and affected by the interest rate linkage mechanism of the United States externally, and the overall changes are complex, pluralistic and comprehensive.

3.4 STRUCTURAL IMPACT ON CHINA

The US interest rate hike has a strong impact on and even reconstructs important parts of China's economic structure, such as investment, consumption, import and export. According to the above, once China enters the interest rate hike cycle, the cost of borrowing funds of domestic enterprises rises, reducing the willingness of enterprises to expand the scale of reproduction and operation, and then reducing the demand for state-owned capital investment, while the US dollar exchange rate rises, domestic capital outflows, foreign investment funds also flow to the United States, and the amount of investment in China decreases. Reduced investment and reduced reproduction by enterprises means that economic growth shrinks, employment opportunities are reduced, household incomes are reduced, and household consumption is reduced. The decline in the exchange rate makes foreign goods more expensive, domestic goods are cheaper, residents will transfer the original demand for foreign goods to domestic goods, and foreign residents also increase the consumption of Chinese goods, reduce the import of foreign goods while stimulating the export of domestic goods.

All in all, strong interest rate hikes in the United States have led to lower consumption and lower investment in China, and an increase in net export trade.

4 FOR FED INTEREST RATE HIKE RELATED ADVICE

4.1 OPTIMIZE FOREIGN EXCHANGE RESERVES

Foreign exchange reserves as the largest share of the central bank's assets, indicating that foreign exchange changes are very easy to affect China's market, affect the coordination and effectiveness of monetary policy, in this regard, China should do a good job in the management of foreign exchange reserves, control foreign exchange shares, optimize the entire reserve structure, the reserve body from the central bank to the masses, promote the diversification of private investment and financing channels, the Tibetan remittance in the country into the Tibetan remittance in the people, but also can enhance the flexibility of China's exchange rate system.

4.2 ADVICE ON RMB EXCHANGE RATES

When the RMB exchange rate is relatively weak, it can comply with the market's expectation of lowering the RMB, and should not go against the general trend of the market, but at the same time, to prevent the confidence panic caused by the unilateral decline of the market, the central bank needs to use policy tools to properly intervene in the RMB exchange rate to prevent it from falling too fast. Although China's economy is under pressure from interest rate hikes, it cannot interfere with the market's confidence in the RMB due to the appreciation of the US dollar, and it is necessary to maintain the stable operation of the foreign exchange market regulation mechanism. In addition, according to the above analysis, the RMB forward exchange rate will recover relative to the spot, and attention should be paid to preventing a sharp rebound of the RMB exchange rate, and appropriately controlling the RMB exchange rate level at present, leaving room for future RMB appreciation.

4.3 PROMOTE THE INTERNATIONALIZATION OF THE RMB

The Fed's interest rate hike will lead domestic inflationary pressure to other countries, making the international financial market under common pressure, harming the interests of other countries, while interfering with the normal operation of the global trading system, the trust of the world market in the dollar has declined, the Fed's interest rate hike has a very limited effect on the return of the US economy to normal, and the US economy is likely to fall into recession in the future. The US dollar interest rate hike has put pressure on the internationalization of the RMB in the short term, and the interest rate hike has caused international capital to flow back to the United States, putting pressure on the liquidity contraction of emerging economies, but to a certain extent, it has guided the pace of RMB internationalization. In the medium term, the liquidity of the US dollar will become tighter, the international market will increase the use of RMB to supplement the liquidity of the international market, and the internationalization of the RMB can promote the diversification of currency reserves of various countries to diversify the risk of currency market fluctuations and maintain currency market stability.

China can choose to increase cooperation with the BRICS countries, rely on the AIIB and the Belt and Road, focus on promoting the use of RMB in transactions of countries along the Belt and Road, focus on currency cooperation with East Asian countries, and launch more RMB derivatives to meet the diversified needs of the international investment and financing market for products needed for RMB exchange rate hedging.

4.4 Deepen Supply-Side Structural Reform

To cope with the fluctuations of the world financial market, it is necessary to develop economically. In view of the problems of insufficient foreign demand, overcapacity, and uncoordinated development of supply and demand, in order to carry out economic development, it is fundamentally necessary to deepen supply-side reform, match supply with market demand, and improve resource allocation efficiency and use efficiency. First of all, because China's market mechanism is not perfect and sensitive, the price cannot fully reflect the market supply and demand, China's land, technology, labor factor prices are in a passive state, we must take the initiative to improve the market price mechanism, risk mechanism, supply and demand mechanism, competition mechanism. Secondly, to reduce the cost of the real economy, China's market mechanism is not perfect, the probability of various gray costs and hidden costs of enterprises increases, and it is difficult to use all funds to improve product quality or investment to increase sales, therefore, China's supply-side structural reform can improve more space, but the difficulties faced are more arduous than other countries. Finally, the state should increase investment in science and technology, protect intellectual property rights, encourage entrepreneurs to invest in innovation and creativity, create high value-added products, and promote the transformation of Chinese manufacturing to China's intelligent manufacturing.

5 Conclusion

All in all, the sharp interest rate hike under the United States, the characteristics of shorter and larger cycles, the rising US dollar index, bringing great instability to the global economy, the RMB exchange rate has been severely challenged in the short term, the outflow of domestic funds has increased, the pressure on foreign exchange reserves has increased, consumption and investment have weakened, and domestic asset prices have been impacted. In the long run, although it faces the risk of imported deflation, the exchange rate pressure will also decrease, the competitiveness of the industrial chain will be strengthened, and the RMB will accelerate the pace of internationalization to supplement the liquidity of the international market. Although the current performance of the US dollar is very strong, but the US dollar is not only rising but not falling, the future recession or various uncertain possibilities, the short-term and long-term economic of the United States brings not only challenges, but also opportunities, China should seize the opportunity, on the basis of maintaining market confidence and stability, controlling market risks, promote the internationalization of the RMB, promote the stability and long-term development of China's economy.

References

[1] HE Qiang, WANG Tingting.The impact of the Fed's interest rate hike on China and its response strategy[J]. price theory and practice,2016(10)

[2] Liang Liguang From the perspective of international financial market, the transmission mechanism of US dollar interest rate hike to RMB exchange rate[J]. Journal of Financial Economics, 2005(5).

[3] Peng Bo, Song Shuo, Zeng Liwen, Ding Yetong The impact of RMB exchange rate fluctuations on the current Chinese economy and its response[J] International Business Accounting, 2022(21).

[4] Chen Yanyan The impact of the Fed's interest rate hike on the RMB interest rate and exchange rate[J] Modern Business, 2022(29).