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An Assessment of the Spillover Effects of Fed Rate Hikes on Chinese Economy

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Abstract: Facing the pressure of high CPI, the interest rate hike process has initiated by the Federal Reserve (Fed) in the context of the global economic downturn in 2022. This adjustment in the Federal Reserve's monetary policy has a significant influence on the global economy, including China. This article focuses on the spillover effect of the Federal Reserve's interest rate hike policy on Chinese economic development. It will first review the historical background and impact of the four interest rate hikes cycles in the Unite States since 1994. And then the analysis of the impact is presented in three different transmission channels: interest rate channel, exchange rate channel, and capital flow channel. After that the policy suggestions on how to deal with the spillover effect is provided. Lastly, this article concludes that even though the spillover effect of interest hike policy continues to put downward pressure on Chinese economy, it is shrinking with China becoming more independent in implementing its monetary policy.

Keywords: interest rate hike, monetary policy, transmission channel, spillover effect

1. Introduction

The openness of economies around the world is constantly increasing with the advancement of economic globalization. In the meantime, international ties are strengthening. The world's other nations will be affected to varied degrees by changes in the economic policies of those nations with strong economic strength. Due to the United States' robust economic performance and the dominance of the US dollar in the global monetary system during the past few decades, every modification to the Federal Reserve's monetary policy will have a major effect on the world economy. In March 2022, The Federal Reserve increased the federal benchmark interest rate from 0.25% to 0.50% by 25 basis points, marking the first interest rate increase by the United States since 2018 [1]. Facing the pressure of high CPI, the Federal Reserve has further accelerated its interest rate hike process in the context of the global economic downturn. In the June 2022 interest rate meeting, the increase in interest rate rise to 75 basis points. In July, September, and November, the target range of 3.75% to 4.00% was reached by continuously raising the Federal Funds Rate by 75 basis points, marking the largest interest rate hike in 22 years [1]. In addition, the reserve requirement ratio and other policy interest rates such as Overnight reverse repurchase rate and credit rate has also increased. In February, March, and May 2023, interest rate was raised by another 25 basis points respectively [1].

China is the world's largest emerging economy, and the stability of its domestic economy is closely related to changes in US economic policies. Therefore, studying the impact of the Federal Reserve's

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interest rate hike policy on Chinese economic development is of great practical significance in reducing the spillover effect of the Fed's interest rate hike on Chinese economy and providing corresponding policy recommendations on how to maintain the independence of domestic monetary policy, so that Chinese economy can better respond to external shocks and maintain stable growth in the turbulent international economic and financial environment.

This article mainly studies the spillover effect by presenting the transmission channels of the spillover effects of US monetary policy from a theoretical perspective by reviewing literature. The remainder of the essay is split into four sections: The first section examines the Federal Reserve's cycle of interest rate increases during the previous few decades; the second part is the analysis of the impact of interest rates hike on Chinese economy by different transmission channels; the third part is the policy suggestions to deal with the spillover effect; the last part is the conclusion.

2. The Interest Rate Hike Cycle Since 1994

Since the 1990s, the Federal Reserve has gone through four complete interest rate hike cycles, each of which has had varying degrees of impact on the global economy and caused economic crises in many countries, affecting global financial stability. In order to gain a deeper understanding of the impact of US dollar interest rate hikes on Chinese economy, the following will elaborate on the four interest rate hike cycles of the Federal Reserve.

2.1. The First Cycle of Intrest Rate Increases (1994.2-1995.2)

From 1990 to 1991, the US economy experienced a period of depression, with a significant decline in GDP growth rate starting from the second quarter of 1990. The GDP growth rate in the first three quarters of 1991 was negative [2]. During this period, the inflation rate in the United States decreased, while the unemployment rate continued to rise to 7.8% in June 1992 [2]. In order to boost the domestic economy and increase employment, the Federal Reserve has repeatedly lowered the federal funds target rate until September 1992, when the federal funds rate remained at 3% [3]. The Federal Reserve's measures led to an effective recovery of the domestic economy. In 1992, the fourth quarter GDP growth rate rebounded to 4.33%, and the unemployment rate began to show a downward trend after reaching its peak in September 1992 [1]. In order to prevent inflation, the Federal Reserve raised interest rates on February 4, 1994, and began the rate hike process [4]. The Fed's rate hike cycle lasted for one year, ended on February 1, 1995. The interest rate increased seven times totally, and ultimately rose to 6% [4].

In this round of interest rate hikes, China was also in the midst of monetary contractionary policies [5]. According to Keynesian economic theory, an increase in interest rates has a multiplier effect on investment, which suppressed the trend of China's investment growth rate at that time [5].

2.2. The Second Cycle of Interest Rate Increases (1999.6-2000.5)

The Asian financial crisis broke out in 1997, causing severe fluctuations in the global stock and exchange rate markets [3]. In response to the crisis, the Federal Reserve began implementing interest rate cuts in September 1998 [3]. By November 1998, it had decreased the interest rate three times and the federal funds rate had dropped to 4.75% [4].

As Asian economies experienced consecutive financial crises, the United States was going through a period of vigorous internet development [2]. Driven by the IT wave, the US economy has grown rapidly. Since the second quarter of 1996, US GDP growth has stayed constant at around 4% [2]. Meanwhile, the unemployment rate in the US has decreased steadily since 1997, and by May 1999, it had dropped to 4.2% [5]. Under this context, in order to stabilize domestic inflation levels, the Federal Reserve has once again started the interest rate hike cycle. In June 1996, interest rate hikes

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were resumed, and by May 2000, a total of 6 hikes were made, raising the US federal funds rate by 175 basis points to 6.5% [5].

Unlike the rapid growth of the US economy, during this period, other major and emerging economies in the world continued to be affected by the Asian financial crisis [5]. This round of interest rate hikes in the United States has further exacerbated the outflow of capital from emerging economies, which has had a negative impact on their economic recovery [5].

2.3. The Third Cycle of Interest Rate Increases (2004.6-2006.6)

Due to the burst of the Internet foam and the "911" terrorist attack, the US economy has fallen back into recession since 2001 [2]. In order to boost the economy, the Federal Reserve has implemented expansionary monetary policies since 2001, continuously reducing the federal funds rate to 1% [3]. In 2003, the GDP growth rate of the United States significantly increased compared to the previous year, increasing by 4.69% [4]. In 2004, the GDP continued to grow, reaching a growth rate of 6.62% [4]. In 2002, the inflation rate in the United States was only 1.59%, and the rapidly growing demand driven inflation rate reached 2.68% in 2004, and the unemployment rate decreased to 5.6% [4]. In order to prevent inflation and economic overheating, the Federal Reserve began raising interest rates again in June 2004 [3]. The interest rate increased from 1% to 5.25% throughout the course of the two-year interest rate hike cycle [3].

This round of interest rate hikes triggered for the outbreak of the US subprime mortgage crisis. A few years before the interest rate hike, the US real estate market was highly prosperous, and the subprime mortgage market developed rapidly [5]. Affected by continuous interest rate hikes, the rising interest rate intensified the pressure on homebuyers to repay their loans. With the decline in housing prices, there was a sharp increase in subprime mortgage defaults, directly triggering the subprime crisis [5]. Additionally, the contractionary monetary policy of the Federal Reserve coincided with Chinese macro-control monetary policy at that time, rendering the growth rate of Chinese domestic fixed assets investment fall back [5].

2.4. The Fourth Cycle of Interest Increases (2015.12-2018.12)

The outbreak of the US subprime mortgage crisis in August 2007 caused a global financial crisis, which dealt a devastating blow to the US and even the global economy. Since the fourth quarter of 2007, the GDP growth rate in the United States has significantly decreased and remained negative from the third quarter of 2008 to the fourth quarter of 2009 [2]. In the meantime, the unemployment rate increased to 10% in October 2009, reaching its highest level since the 1990s and the core inflation rate continued to decline and dropped to 0.6% in October 2010 [2]. In order to improve the deteriorating economic situation, the Federal Reserve began implementing interest rate cuts in September 2007, lowering the federal funds rate to 0.25% for 10 consecutive times [4]. In 2015, the economy reached the long-term target set by the Federal Open Market Committee, and the Federal Reserve began its interest rate hike cycle on December 16, 2015 [4]. From 2015 to 2018, the Federal Reserve conducted 9 rate hikes, each by 0.25%, raising interest rates from 0.25% to 2.5% [5]. The continuous appreciation of the US dollar, coupled with the impact of massive capital outflows, has caused significant economic fluctuations in many emerging countries [4].

3. The Impact of Interest Rates Hike on Chinese Economy

The US monetary policy has a complex multi-dimensional impact on China's economic development from different transmission channels. Specifically, through channels including interest rates, currency rates, and capital movement, the US interest rate increase has an influence on China's economy [5].

3.1. Interest Rates Channel

The interest rate channel refers to changing domestic interest rates in order to counteract the real interest rate trend of other nations, which changes economic indicators such as money supply, investment, and total output, and achieves economic goals like stabilizing the national economy [1]. The interest rate hike in US has led to a decline in the global money supply, which affects Chinese interest rate volatility, investment, consumption, and ultimately total output [1].

The US currency appreciates when the Federal Reserve raises the federal funds rate., which results in capital flowing from other countries to the United States in pursuit of higher returns. In order to prevent the outflow of foreign capital from causing fluctuations in Chinese capital market, the central bank of China had to follow the footsteps of the Federal Reserve to raise interest rate, thus showing a trend of rising domestic interest rates [6]. In response to the Federal Reserve raising the federal funds rate in December 2016 and March 2017, the People's Bank of China correspondingly increased the open market reverse repurchase rate, standing lending facility rate, and medium-term lending facility rate [7]. This led to an increase in domestic interest rates, which narrowed the corporate profit margins due to increased social financing costs, leading to a decrease in stock prices [7]. During the three rate hikes by the Federal Reserve from August 2022 to February 2023, China's interbank lending rate also showed a similar increasing trend [1].

In December 2015, after the Federal Reserve started to raise interest rates, the growth rate of China's fixed assets investment dropped. The year-on-year growth rate of fixed assets investment in February and July 2016 was -15.83% and -19.84% [5]. In 2016, the total amount of fixed assets investment increased by 8.1% year-on-year, which is 1.9 percentage points lower than that in 2015, and the year-on-year growth rate in 2019 descended to 5.4% [5]. In addition, figure 1 shows the fluctuation of Chinese interest rate level when facing a positive unit of federal funds interest rate shock. Using this figure, Yang indicates that the impact of the interest rate hike cycle from December 2015 to June 2018 is greater than the impact of the previous interest rate hikes from June 1999 to June 2000 and from June 2004 to June 2006 on China's domestic interest rates [6]. This means that Chinese domestic interest rate is increasingly influenced by the Federal Reserve's monetary policy. This is mainly due to the deepening integration of global economic and financial development, which makes it impossible for any country's capital market to remain independent [6]. As China continues to open up its capital market, foreign investors have increased their activities in the domestic capital market [6]. Therefore, domestic interest rates are more susceptible to fluctuations in the US federal funds rate. Particularly, four months after the Federal Reserve raised interest rates, China's domestic interest rate market was hit the hardest [6].

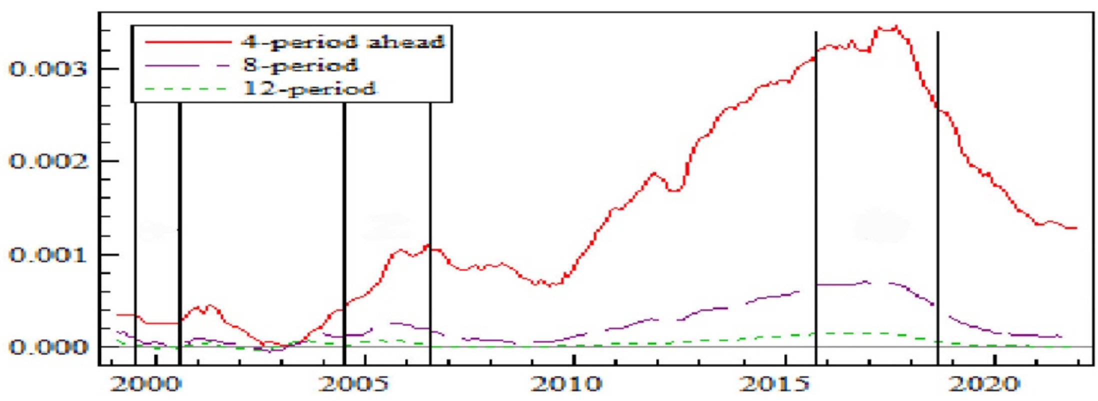

Figure 1: Pulse Response Graph of the US Federal Funds Rate to Chinese Interest Rate.

However, even though the Federal Reserve's interest rate hike has a lagging impact on Chinese economic output, the effect is limited [1]. It is also worth noticing that in the face of the impact of the COVID-19, China focused on stabilizing the economy and employment, and implemented the "self-dominated" monetary policy according to the needs of national conditions, therefore, after 2020 the sensitivity of China's domestic interest rate to the Federal Reserve's interest rate hike has decreased [6].

3.2. Excahnge Rate Channel

Under the context of economic globalization, trade exchanges are becoming increasingly frequent, and exchange rate fluctuations among countries have become a key factor affecting international economic trade. Thus, Exchange rate transmission channels have become an important path for countries' monetary policies to affect other countries [1]. According to the interest rate parity theory, a rate hike by the Federal Reserve will exert depreciation pressure on the Chinese currency (RMB), leading to international capital outflows and affecting domestic asset prices [8]. In addition, China uses a managed floating exchange rate mechanism at the moment. The central bank's actions to hedge against the pressure of RMB depreciation caused by the Federal Reserve's interest rate hike will stabilize the exchange rate by releasing foreign exchange reserves [9]. Chinese foreign exchange reserves decreased month by month after reaching a peak of $3.99 trillion in June 2014, and by the end of November 2015, they had decreased to $3.44 trillion [10]. This would reduce the domestic money supply and also exert downward pressure on domestic asset prices [9]. Plus, the strengthening trend of the US dollar appreciation also affects the development of domestic and foreign trade, thereby affecting Chinese net export and output levels [1].

As indicated in figure 2, which is the dynamic response of the Chinese economy after the Federal Reserve raises interest rates, by constructing an open economy model using dynamic stochastic general equilibrium model (DSGE), He et al. conclude that after the Federal Reserve raised interest rates, domestic nominal interest rates increased, and the RMB exchange rate depreciated significantly in the first three quarters [11]. After the fourth quarter, it started to appreciate slightly, reaching a new equilibrium level in the tenth quarter [11]. The depreciation of the exchange rate has led to a sharp decrease in import demand, an increase in export demand, and an increase in domestic price levels [11].

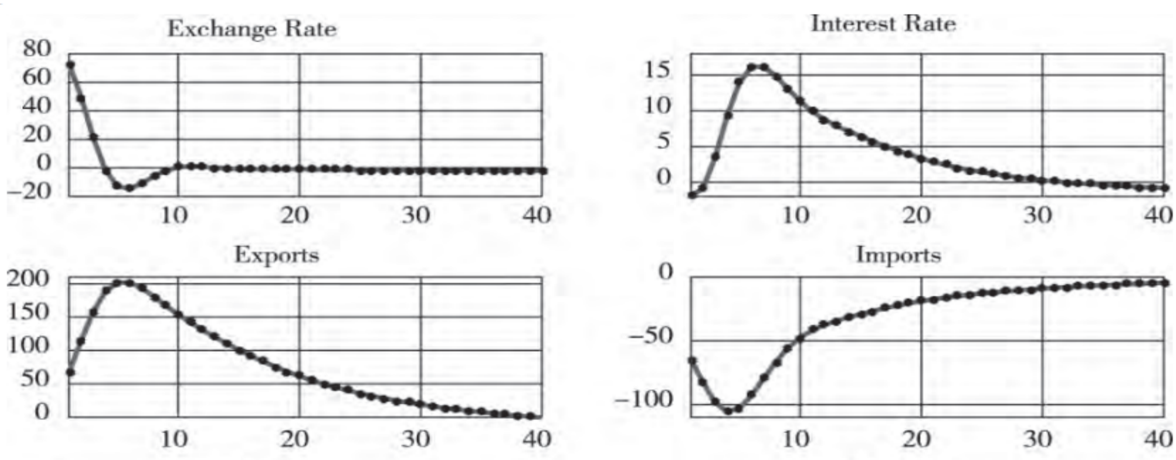

Figure 2: Pulse response of interest rate shocks.

Indeed, after the Federal Reserve restarted interest rate hikes in December 2015, it had a certain impact on China's imports. In March 2016, the total import volume decreased by 8.1 percentage points year-on-year, while the total export volume increased by 7.5 percentage points [5]. In April 2016, the

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total import value decreased by 11.1%, while the total export value decreased by 5.3%. Yet the decrease in exports was smaller than that of imports. Overall, raising interest rates has a certain positive impact on net exports [5].

However, it is worth noticing that since the exchange rate reform in August 2015, Chinese exchange rate market mechanism has made great progress. Because of this continuous improvement and marketization of the foreign exchange market system, the impact of fluctuations in the real effective exchange rate of the RMB on Chinese domestic output is shrinking, and the growth of China's economy is getting more and more stable [6]. Especially, during the interest rate hike cycle from December 2015 to June 2018, the fluctuation of the real effective exchange rate of the RMB had almost no impact on China's economic development [6].

3.3. Capital Flow Channel

The term "capital flow transmission" describes how changes in foreign exchange rates have an effect on domestic economic activity [5]. Domestic interest rates in the United States have increased as a result of the Federal Reserve's launch of its interest rate rise program [1]. Under the conditions of free flow, Chinese capital flows from the domestic financial market to the international capital market, causing volatility in the stock market [1]. The stock markets between countries have mutual influence, and the US stock market will also be affected by the Federal Reserve's monetary policy, which in turn will affect the relative equilibrium state of the Chinese stock market [1]. The three consecutive interest rate hikes from June 2022 to November 2022 caused a vibrating decline in China's stock market, and the Shanghai Composite Index continued to show a cyclical downward trend after data smoothing fitting [1].

Additionally, the relative changes in the investment environment also affect and drive international capital to flow out of emerging economies and back to the United States [5]. On one hand, when the Federal Reserve raises interest rates, the American economy typically expands quickly with strong investment returns and clear prospects for future expansion. [5]. On the other hand, emerging economies frequently implement contractionary monetary policies in response to the Federal Reserve's interest rate rise, leading to a decline of prices in capital market and a decrease in investment returns [5].

In addition, the global supply chain is affected by the fluctuations in US interest rate hikes, causing fluctuations in asset prices in China, leading to an increase in operating costs and a decrease in revenue for enterprises, thereby affecting their development and expansion abilities [1]. Since December 2015, capital outflows have driven up prices in China in the short term and then rapidly declined [7]. Chinese prices are under some deflationary pressure as a result of the Federal Reserve's interest rate rise strategy, capital outflow, and tightening domestic liquidity [4]. The US interest rate hike has intensified Chinese capital outflow in the short term, causing a sharp decline in housing prices [7]. As the market adapts to the interest rate hike and its expectations, the trend of capital outflow has gradually eased, and housing prices have subsequently rebounded [7].

Currently, Chinese capital account has not been fully opened, and after the Federal Reserve raised interest rates, the government has strengthened its control over international capital flows, alleviating the risk of further decline in asset prices [9].

4. Suggestions

4.1. Improve Monetary Policy Tools

For a long time, the People’s Bank of China has mostly used quantitative monetary policies such as changing the reserve requirement ratio to regulate the domestic economy [4]. If the Federal Reserve continue the process of raising interest rates, the short-term capital outflows in China will lead to a

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decrease in foreign reserve and domestic base money supply, and the liquidity will also reduce. In this context, the central bank can flexibly use various tools including reverse repurchase SLO, MLF and PSL to hedge liquidity, increase the base currency and expand the money multiplier. In addition, since 2020, the spillover effect of changes in the US federal funds interest rate on China's domestic interest rate level has greatly weakened [6]. Therefore, when faced with a rate hike by the Federal Reserve, China can implement an independent monetary policy based on the domestic economic situation, instead of choosing to follow the rate hike strategy.

4.2. Accelerate the Internationalization and Marketization of RMB

In theory, a floating exchange rate system will slow down the impact of other countries' monetary policy spillover effects on their own economy. Currently, the controlled floating exchange rate system is the one used in China, which does not have enough ability to flexibly adjust the domestic economy to address the spillover effects of other countries' monetary policies [4]. China should advance exchange rate reform, broaden the scope of the RMB exchange rate's free floating, and boost the function of exchange rates in the market economy in order to ensure steady and sustainable economic growth. The market-oriented reform of the RMB exchange rate has advanced significantly in recent years. The progress of the marketization of China's exchange rate system was underlined in August 2015 by improvements to the RMB exchange rate central parity formation mechanism [2]. Additionally, the publication of the CFETS RMB exchange rate index in Chinese foreign currency trading in November 2015 coincided with the RMB's formal entry into the SDR system, sending a message to the market that the RMB is decoupling from the US dollar [2]. In the future, the market formation mechanism for the central parity rate of the RMB exchange rate can be further optimized, and the floating range of the RMB can be relaxed or even cancelled at the appropriate time.

5. Conclusion

This article studies the impact of the Federal Reserve's interest rate hike policy on Chinese economic development. It first reviews the historical background and impact of the four interest rate hikes by the Federal Reserve since 1994. And then the analysis of the impact is presented in different transmission channels. In the interest rate channel, the Federal Reserve's interest rate hike policy tends to increase the domestic interest rates of China, putting downward pressure on Chinese economy. In the exchange rate channel, raising interest rates leads to appreciation of US dollar, which has a certain positive impact on net exports of China. In the capital flow channel, the interest hike makes Chinese capital flow from the domestic financial market to the international capital market, causing decline in asset price level. Overall, the spillover effect of interest hike policy is shrinking with China becoming more independent in implementing its monetary policy. Lastly, two suggestions on how to tackle the spillover effect is provided. The suggestions are to improve the monetary policy tool and accelerate the internationalization and marketization of RMB. In the post-COVID-19 era, China is still facing downward pressure in the development of the economy. Even though the inflation rate of America is gradually decreasing, it is believed this interest rate hike cycle will not end in the short term. However, there is no doubt that all the difficulties caused by this interest rate cycle will be tackled eventually with China becoming more and more independent.

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