

Research on the Impact of Fed Rate Hike on China's Macro-economy

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Abstract. Considering the dominance of the United States Dollar and the background of the global weak economy hindered by covid-19 as well as the tangled geopolitics, it is essential to analyze how the fed' announcements affect the world. This article explores how the key macroeconomic indicators changed before and after the fed rate hikes and look into the mechanisms behind it. The result shows that global liquidity does not see a rapid change; commodities prices do exist a negative correlation with the U.S. interest rates, explained by the holding cost of inventories. In terms of the effect on China, the short-term cross-border capital outflow is positively related to the China-US spread; meanwhile, currency devaluation is happening. China's response to such shocks is not consistent with the idea that other worlds outside the U.S. need to increase the interest rate to keep pace with the fed reserve announcement. Rather, the People's Bank of China decreases its one-year loan prime rate from 3.70 to 3.65 percent in August 2022. To prevent capital outflows and currency devaluation, capital control takes place. On August 27, 2022, Jay Powell, the chair of the US Federal Reserve, declared that taming the surging inflation was the priority despite the cost for households and businesses. It is expected that the fed reserve will continue its tight monetary policy, so emerging economies like China should be prepared for it.

Keywords: Fed Rate Hike; financial markets; China's Macro-economy.

1. Introduction

1.1 Research Background and Significance

Faced with the Covid-19 pandemic, the Federal Reserve implemented a quantitative easing program and lowered interest rates to near zero to prevent the economy from recession. These moves led to the massive assets taken by the Fed Reserve. These loose monetary policies push high the price of products in a certain way. A recorded high CPI followed forced the Fed to raise interest rates during 2022. On July 27, 2022, the Federal Reserve announced a fourth rate hike. The U.S. is the most developed country in the world, so the Fed is equivalent to the world's central bank, and every move it makes will attract great attention from all over the world. There is evidence that the Fed's rate hike will have a relatively big impact on emerging countries such as China, but because world trade and investment are increasingly connected as a whole, the United States will inevitably be affected by emerging markets. Therefore, when the Fed chooses to raise interest rates, it has to consider the tolerance of developing countries and adopt a more moderate approach to gradually raise interest rates.

1.2 Literature Review

The Fed has raised interest rates seven times in its history since the 1980s[1]. Due to the dominance of the U.S. dollar, a large literature explores how the Fed announcement affects the global financial market and emerging countries. These studies focused on the shocks caused by Federal Reserve. The study evaluates how the Fed's tapering news influences emerging countries' markets[2]. Another recent study investigated the specific effect of the U.S. rate hike considering the reason for the Federal Reserve announcements, arguing that a higher rate from inflationary pressures could lead to an adverse effect on emerging market economies[3]. Although the Fed has raised interest rates many times, the influence of the Fed's policy has varied greatly from time to time[4]. So it is necessary to

analyze the effect of the new round of Fed rate hikes under the post-pandemic area combined with complicated geopolitics.

1.3 Research Framework

This article is organized into several parts. First, the article analyzes the effect of the Fed rate hikes on the global financial market signified by global liquidity and commodities prices. Then, to understand what happened in China, the article focuses on capital flows and exchange rates. Finally, the article looks into China’s responses to the Fed’s monetary policy.

2. The Influence of Fed Rate Hikes

Fed rate hikes affect global financial markets in a complex way. Considering its importance, this article analyzes two aspects of financial markets, namely global liquidity and commodities prices. The Fed raises the federal funds rate, affecting global liquidity and putting it at risk of contraction. There is no precise and unique definition of global mobility[5]. According to the Bank for International Settlements (BIS), global liquidity means how easily the agents can finance themselves in global markets[6]. D Domanski, etc(2011) point out the usefulness in a variety of ways and is consistent with the BIS about the definition of global liquidity[7]. Generally, liquidity depicts how easily an asset can be transformed into a way of payment. Borrowing is a kind of way to finance by using assets as collateral. The less the behavior affects the price of funding, or interest rate, the greater the liquidity. Fed raises federal funds rate, raising interbank borrowing costs, leading to a global liquidity crunch. It is essential to analyze global liquidity for several reasons. One reason is the spillover effect of major economies’ monetary policy in such an interconnected world. Besides, shocks can pass over borders even though a low cross-border capital flow takes place. More, the interaction between global liquidity and the real economy needs more attention[8]. There is no single measure of global liquidity condition. According to the BIS, global liquidity indicated by three indicators, depicted in figure 1, showed a slight decline in March 2022, the beginning phase of the Fed rate hike. Whether this trend would amplify need more attention.

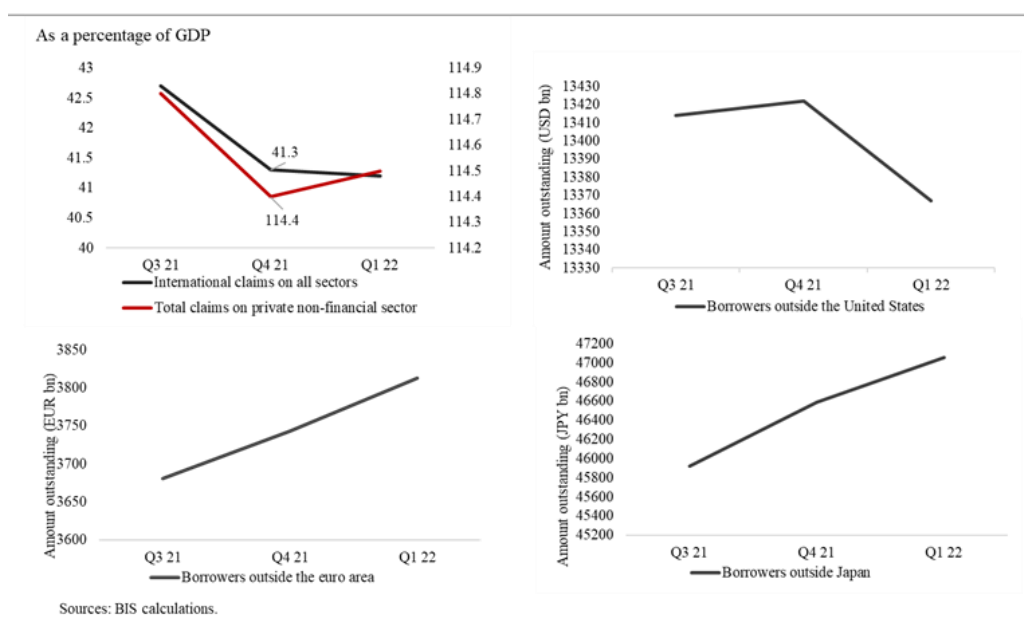


Fig. 1 Indicators of global liquidity

How does liquidity change and transmit across countries? Global liquidity measures the ease of credit. When credit provider refuses to inject more liquidity into markets, such as central bank conducting tight monetary policy, liquidity will decrease. Through capital flow and international trade,

liquidity volatility in a country, especially a large one, will pass over to other countries. When GDP growth declines, the demand for credit and liquidity will contract too. Simultaneously, international trade and foreign direct investment will be the transmission channels globally.

A large literature explores the relationship between Fed Reserve’s monetary policy and commodities prices [9,10]. They find an inverse relationship between U.S. interest rates and commodity prices. According to figure 2, the future settlement price of gold, silver, copper, and platinum all show a downward trend in a fluctuating way during the period of Fed rate hikes in 2022. The reason behind the inverse relationship lies in the incentive to hold the inventory (JA Frankel, 2008). Higher interest rates mean a higher cost to hold the inventory. The participators in markets tend to buy treasury bills rather than hold commodities contracts.

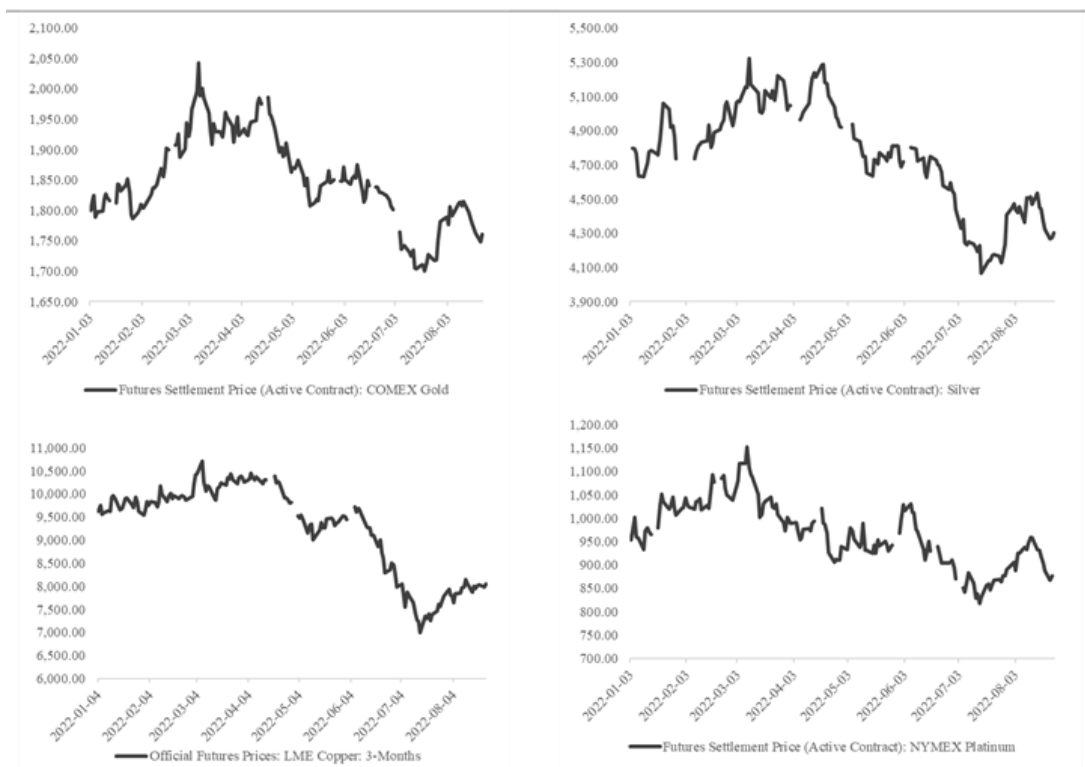


Fig. 2 Commodities prices

2.1 Inflation rate of U.S.

The Fed Reserve performs five general functions to facilitate the U.S. economy and the public interests, among those targets conducting monetary policy for maximum employment and stable prices in the U.S. economy is the most important one [11]. With the soaring inflation rate, the Fed Reserve announced rate hikes in 2022. The picture below shows the inflation trend before and after the Fed’s announcement. The inflation rate in the U.S. increased continuously until July 2022. CPI is the consumer price index, indicating the prices of products and services, which is one of the leading indicators to measure inflation. Recorded inflation forced the Fed Reserve to increase interest rates for the fourth time on July 27. How Fed rate hikes curb inflation? High inflation means the price of a good is unbearably high. To decrease price, demand and supply law takes place. The Fed Reserve controls the federal funds rate, indicating the cost of banks borrowing from each other. Then banks would pass on these higher costs to consumers and businesses, which undoubtedly leads to a decline in overall demand. This is how the Fed rate hikes to curb inflation.

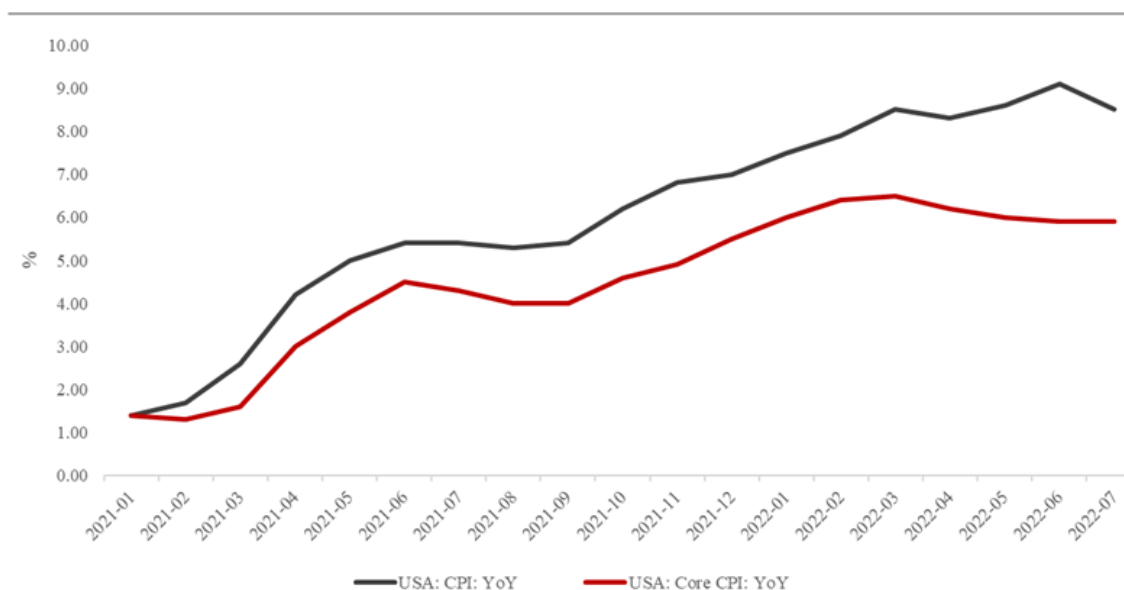


Fig. 3 CPI of United States

2.2 What is happening in China with the Fed rate hike?

As the world's second-largest economy, how is China's macro-economy affected by the Fed's monetary policy? A large literature has explored how the Federal Reserve's monetary policy ultimately affects the Chinese economy and output through the interest rate and exchange rate channels. Madhusudan S. Mohanty (2014) explores that capital flows, exchange rates, and interest rate-setting behavior are channels through which advanced economies' monetary policies affect emerging country economies [12]. X. Weiguo and Z. Yang (2012) find that among many channels, The impact of short-term capital flows is the highest, followed by trade volatility, commodity indices, and RMB exchange rate.[13]. This article will analyze the trend of short-term cross-border capital flows, and the RMB exchange rate of China in the background of Fed rate hikes.

2.2.1 Short-term capital flows of China

How the Fed's monetary policy affects China's cross-border capital flows has always been a hot topic. No unified method to calculate the scale of short-term capital flows. S Tian, D Wang, L Wang (2022) uses the direct indicator in the balance of payments as a proxy to signify China's international capital flow and find Fed's tight monetary policy results in capital outflows from China [14]. S Chan (2017) decomposes capital outflows into four major components and thinks Fed rate hikes reflect some difficulties the policymakers have in complementing economic reforms. This paper follows the indirect method first proposed by the World Bank. By subtracting the foreign direct investment and the trade balance from the increase in foreign exchange reserves, the difference is the indicator of the size of short-term cross-border capital flows. As illustrated in the graphs below, China's short-term cross-border capital flows experienced a downward trend from January to July 2022 when Fed raised interest rates. When considering the China-US spreads, a salient positive correlation exists.

Monetary policy in the United States affects China's capital outflow through the interest rate channel. When the Fed rate hikes happen, resulting in short-term differences in real interest rates between China and the United States, capital flows to high-interest-rate areas.

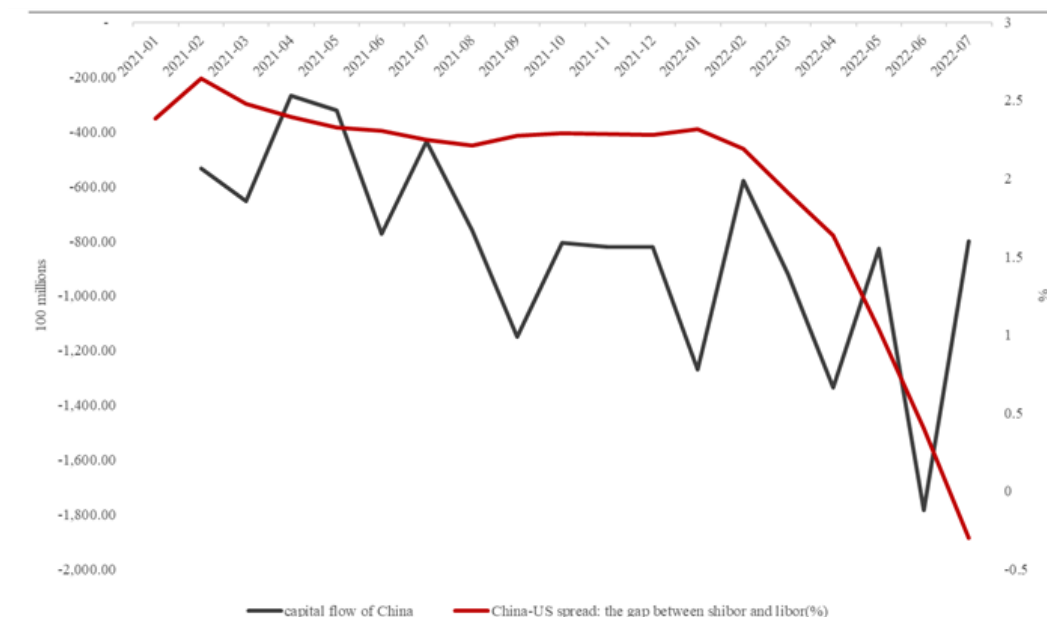


Fig. 4 Short-term cross-border capital flow and China-US spread

2.2.2 Exchange rate

On July 27, 2022, the Federal Reserve announced a fourth increase in its benchmark interest rates this year, setting the federal fund rate to a range of 2.25%-2.5%. Along with the Fed’s operation, The USD/CNY spot exchange rate soared from 6.37 at the beginning of the year to 6.8654 on August 24, 2022, which means a depreciation pressure on RMB, illustrated in figure 5.

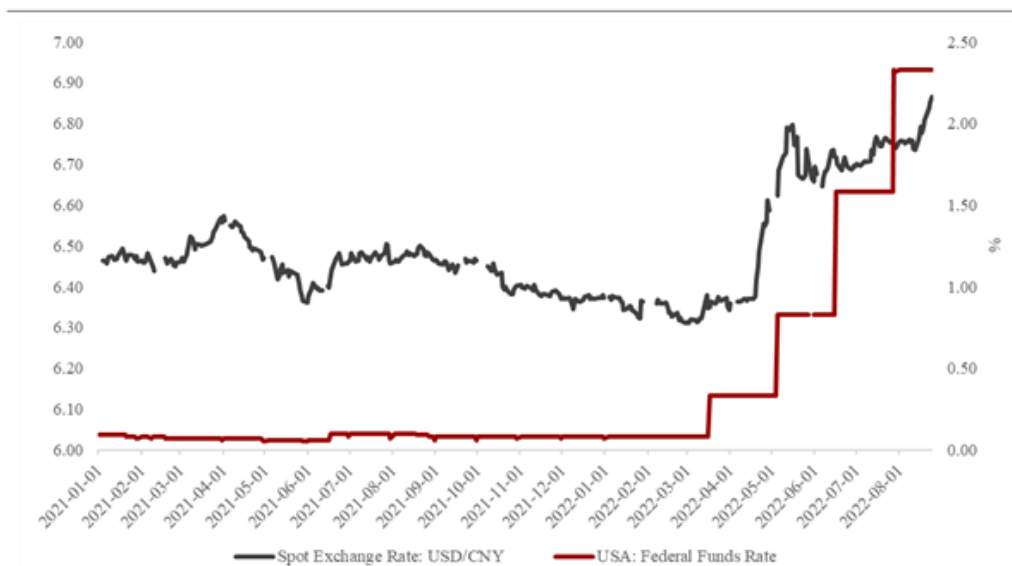


Fig. 5 Federal funds rate and spot exchange rate of USD/CNY

Theories such as the Theory of Purchasing Power Parity, Rate Parity, and Theory of Balance of Payment Adjustment were put forward to explain how the exchange rate was determined. Specifically, when it comes to how the RMB exchange rate is affected by the Fed rate hikes, the basic idea is the rule of Demand and Supply. Capital flows and international trade are two ways influencing the demand for a country’s currency. As discussed above, Fed rate hikes will lead to a capital outflow of China, which then put pressure on RMB depreciation. Besides, capital outflows could cause a decrease in foreign exchange reserves, another factor affecting the exchange rate by changing the expectations of investors. As seen in figure 6, China's foreign exchange reserves fell from \$321.067

billion to \$3,071.27 billion from January 2022 to June 2022. Simultaneously, China's holdings of US Treasuries fell from \$1,095.18 billion to \$967.78 billion.

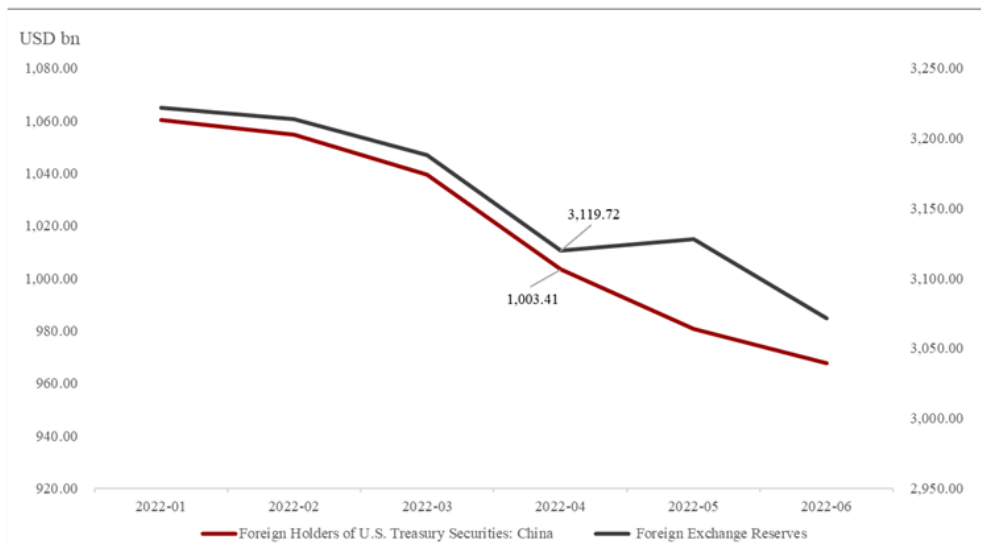


Fig. 6 Foreign exchange reserves of China

Fed increased rates to curb inflation by dampening consumption. When import demand falls in the U.S., in theory, it could lead to a decline in China's export. The trade friction between the U.S. and China and the disruption to global supply chains caused by Covid-19 will make the impact even weaker. This explains the rise of China's exports and the fall of imports to the United States, leading to the expanded trade surplus between China and the United States.

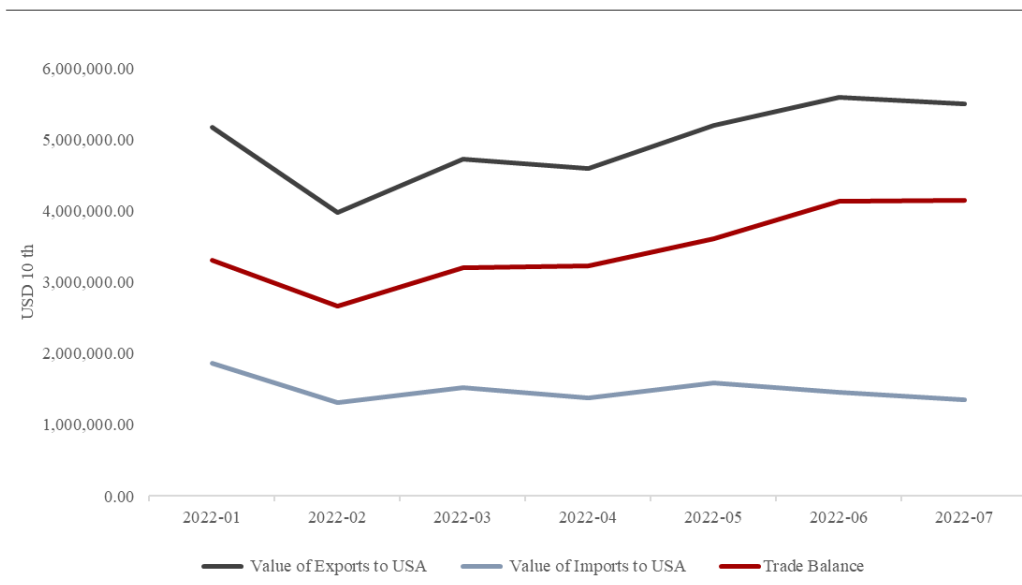


Fig. 7 China's imports and exports to the United States

3. China's response to Fed rate hikes

Combating with the spillover effect of the Fed Reserve monetary policy, many countries followed the Fed's tight policy to increase interest rates. While China does seem to implement a reversed monetary policy by looking at the graph showing a slight decrease in the one-year loan prime rate. The reason behind this can be explained by the trade-off faced by the People's Bank of China, meaning the need to curb the negative effect of the Fed Reserve announcement and to boost the dampened

domestic economy due to the pandemic and real estate industry crisis, by injecting more liquidity. China put more emphasis on the latter.

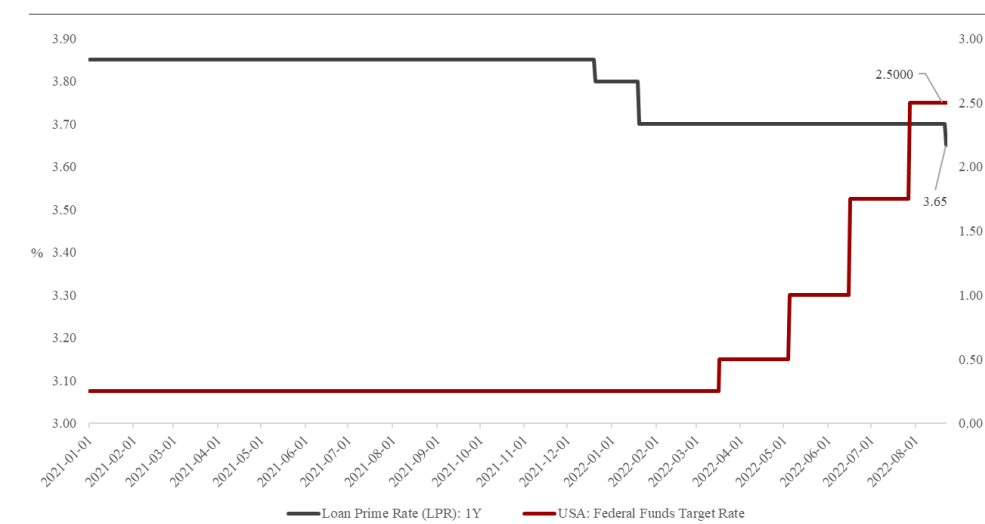


Fig. 8 China's monetary policy to the Fed rate hike

The potential short-term cross borders capital outflow could be tempered by the capital control policy of China. A lot of literature explores the effectiveness of China's capital control [15-17]. A model, known as "the Mundell-Fleming trilemma", describes why capital control plays an important role in regulating exchange rates while keeping the independent monetary policy. According to the "Overview of Foreign Exchange Management" (2009 version) of the State Administration of Foreign Exchange, foreign exchange management is mainly conducted through direct investment management, securities investment management, and credit business management[18]. The Covid-19, conflicts between Russia and Ukraine, combined with the fed rate hikes complexed the global macro-economy, China needs to take more flexible policies to promote domestic demand.

4. Conclusion

This article explores the effect of the Fed's tight policy on global financial markets and what happened in China during the Fed's rate hikes as well as China's response to it. The result illustrates that global liquidity indicated by BIS's calculation does not see a rapid change until March 2022 and deserves more attention on it due to the potential continuous tight monetary policy implemented by the Fed; while commodities prices do exist a negative correlation with the U.S. interest rates, explained by the holding cost of inventories, meaning the market agents tend to buy treasury bills rather than holding commodities contracts. In terms of the effect of the Fed's announcements on China, the short-term cross-border capital outflow is positively related to the China-US spread. High-interest rates attract cross-border capital, leading to a capital flow into areas with high-interest rates. Meanwhile, currency devaluation is happening. Capital flows and international trade are two ways influencing the demand for a country's currency, causing the fluctuation of the exchange rate. China's response to such shocks is different from some other countries. Rather, the People's Bank of China decreases its one-year loan prime rate from 3.70 to 3.65 percent in August 2022. Capital control will be an effective way for China to moderate such negative impacts. Looking ahead, the Fed's rate hike process will inevitably have an impact on the capital inflows of emerging economies; at the same time, factors such as global geopolitical risk trends, inflation trends, and economic stagflation risks are also worthy of attention.

References

- [1] S. Foster, 2022. Fed's Interest Rate History: The Fed Funds Rate Since 1981, Bankrate. <https://www.bankrate.com/banking>
- [2] Aizenman J, Binici M, Hutchison M M. The transmission of Federal Reserve tapering news to emerging financial markets. National Bureau of Economic Research, 2014.
- [3] Kamin S B, Hoek J, Yoldas E. Are higher US interest rates always bad news for emerging markets? 2022. (137) 103585.
- [4] Jin C Y, Zhang L. Shocks of Federal Reserve's monetary policy on China's economy[J]. China Industrial Economics, 2017.
- [5] H. S. Shin, The second phase of global liquidity and its impact on emerging economies, *Income Volatile capital flows in Korea*, Springer, 2014. 247–257.
- [6] Aldasoro I, Ehlers T. Global liquidity: changing instrument and currency patterns[J]. BIS Quarterly Review September, 2018.
- [7] D. Domanski, I. Fender, and P. McGuire. Assessing global liquidity, BIS Quarterly Review, December 2011.
- [8] J. Caruana, “Global liquidity: where it stands, and why it matters,” March 2014, available at: August 26, 2022. Available at: <https://www.bis.org/speeches/sp140305.htm>
- [9] Org Z . The impact of monetary policy shocks on commodity prices[J]. International Journal of Central Banking, 2013, 9.
- [10] The Effect of Monetary Policy on Real Commodity Prices[J]. Social Science Electronic Publishing.
- [11] Board of Governors of the Federal Reserve System, The Federal Reserve System: Purposes and Functions, Board of Governors of the Federal Reserve System (U.S.), October 2016. DOI: 10.17016/0199-9729.10.
- [12] Mohanty M S . The Transmission of Unconventional Monetary Policy to the Emerging Markets - An Overview. 2014.
- [13] XIAO Weiguo and ZHAO Yang, The Transmission of US Monetary Policy Shocks to the China’s Output and Inflation: An Empirical Analysis, *International Business and Management*, 2012, 5(1): 21–26.
- [14] S. Tian, D. Wang, and L. Wang, Spillover impact of the US monetary policy shock on China’s economy: capital flow channel, *Economic Research-Ekonomska Istraživanja*, 2022. 1-23.
- [15] S. Chan, Assessing China’s recent capital outflows: policy challenges and implications, *China Finance and Economic Review*, 2017, 5(1): 1–13.
- [16] Y. Xu, “Policy Analysis: The NDRC’s Reg. No. 11, China’s New Capital Control”, *Hastings Bus. LJ*, 2020,16: 95.
- [17] L. Yang, Analysis of Capital Control Policies in China, *American Journal of Industrial and Business Management*, 2020, 10(2): 492–505.
- [18] State Administration of Foreign Exchange, 2022. Overview of Foreign Exchange Administration. <https://www.safe.gov.cn>.