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The Impact of Large Interest Rate Differentials between China and the US on the Role of Chinese Monetary Policy

-- Based on Data Model Analysis

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Abstract

China and The US interest rates have diverged significantly, and the interest rate deviation, as measured by the 5-year and 10-year Treasury yields, has reached a staggering 228BP. From the perspective of loan spreads, China's LPR continues to decline, while the United States' LPR continues to rise after rising. Interest rate markets have diverged dramatically. Looking at China's money supply in the past 15 years, through data modeling, we find that before 2020, monetary policy has a positive correlation with economic growth, while after 2020, we find that monetary policy has a negative correlation with economic growth. This is a very strange phenomenon. This also shows that China's monetary policy has been unable to achieve its goal of promoting economic growth in the context of huge interest rates in China and the United States. There may be many reasons for this phenomenon, but the biggest one is the huge divergence in interest rate differentials between China and the United States.

Keywords

Economic Growth Rate; Interest Rate; Monetary Policy; M2; Policy Failure.

1. Current Situation of Interest Rate Market in China and US

(1) In the fixed income market

The yield of 5-year and 10-year Treasury bonds are two references for the risk-free yield of a country's interest rate market. In the past 10 years, for most of the time, the yield of China's medium and long-term Treasury bonds was higher than that of the US medium and long-term Treasury bonds. Since April 6, 2022, the yield of the US 5-year Treasury bonds exceeded the yield of China's 5-year Treasury bonds, The yield of US 10-year Treasury bonds also exceeded the yield of China's 10-year Treasury bonds on April 19, 2022. Since then, the yield of US Treasury bonds has risen rapidly, among which the 10-year Treasury bonds soared to the highest stage level of 4.980% on October 23, 2023. At that time, the yield of China's 10-year Treasury bonds was 2.70%. The difference between the two is 228BP, which is a very surprising level of interest rate inversion, such a huge space is bound to cause the rapid flow of cross-border investment funds and cause instability in the fixed income market. The direct cause of the rapid rise in the interest rate of US Treasury bonds is the tightening monetary policy adopted by the Federal Reserve in order to control inflation. The Federal Reserve continues to raise interest rates rapidly, which will not be detailed here.

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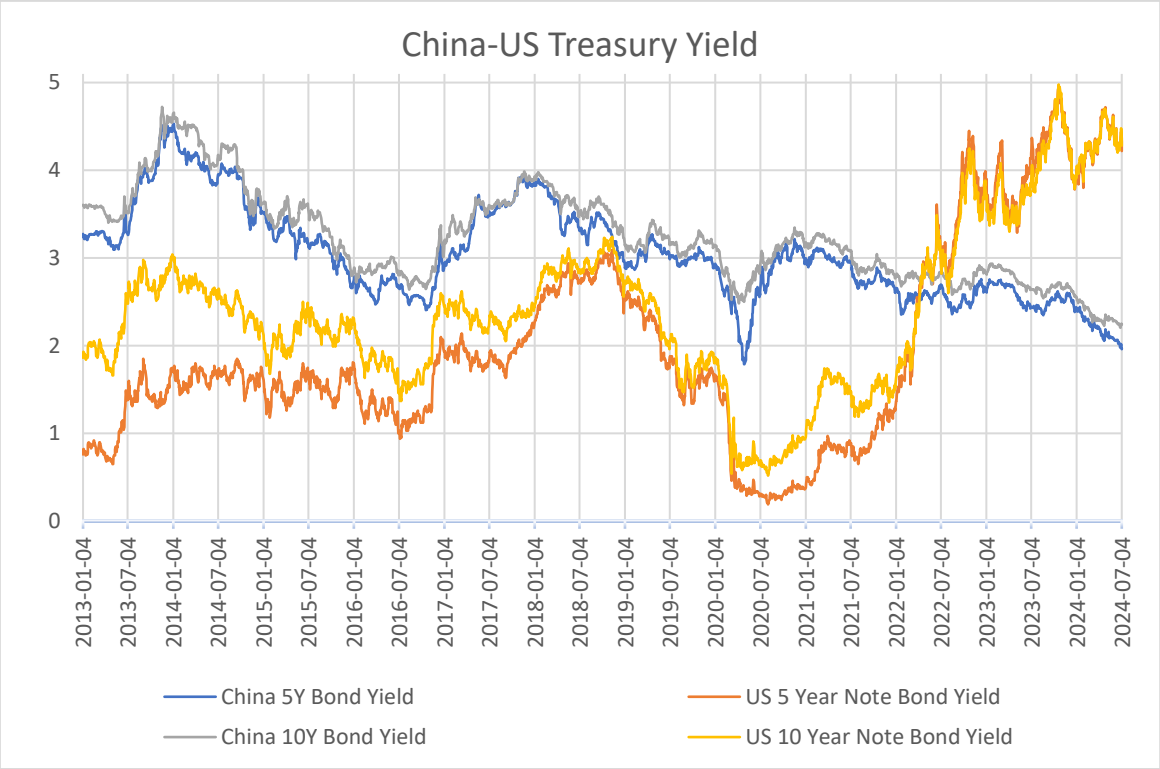

Figure 1. China- US Treasury Yield
Data from Wind Information

(2) In the loan rate market

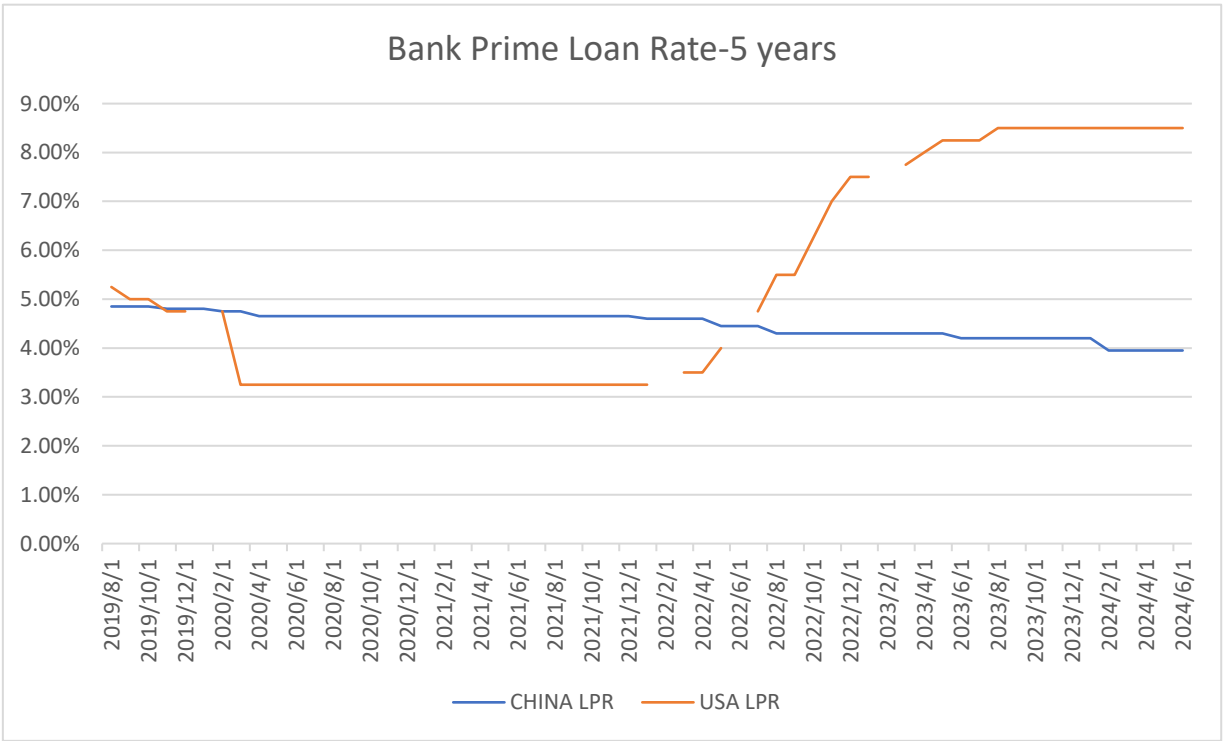

Figure 2. Bank Prime Loan Rate-5 years
Data from Trading Economic and bank of China

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In the past five years, China's loan interest rate has shown a downward trend, especially after the COVID-19 epidemic in 2020, China's 5-year loan interest rate LPR continues to decline, according to the latest data released by China, China's 5-year loan interest rate LPR has dropped to a new historical location of 3.95%. The United States only experienced a decline in proxy interest rates during the new coronavirus epidemic, from April 2022, loan rates rose all the way, to July 2024, 5-year loan LPR has risen to 8.5%.

(3) The changes in the total money supply

Data show that in the past five years, China's central bank has continued to steadily increase the supply of M2, and since the COVID-19 epidemic, China's monetary policy has been relatively loose, resulting in a rising total M2. In the United States, there was a rapid increase in M2 supply after the COVID-19 pandemic in 2020, and it remained at a high level during the pandemic, but from the beginning of 2022, the Federal Reserve gradually contracted the money supply, and the total M2 supply showed a downward trend. From this perspective, compared with the United States, China continues to implement an loose monetary policy.

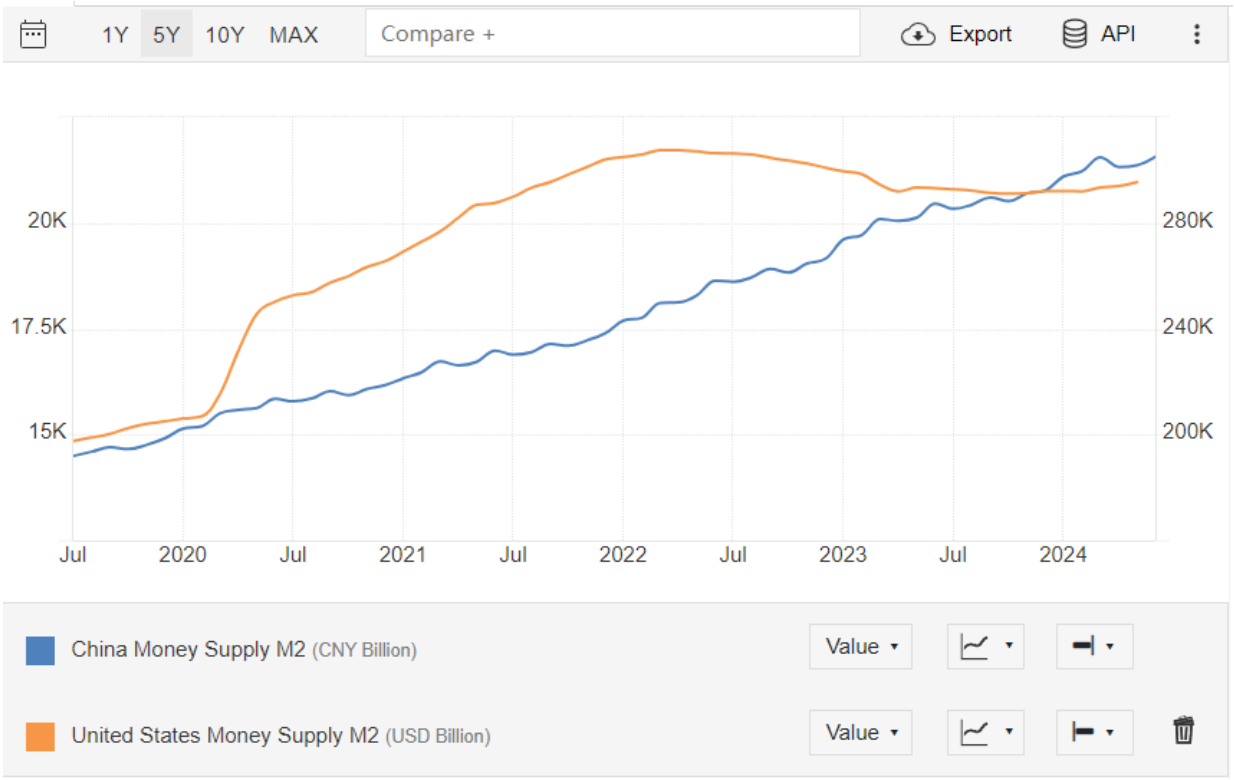

Figure 3. China-US money supply M2
Data from Trading Economic.

2. Regression Analysis of M2 Increase Rate and GDP Growth Rate

2.1. Chinese Economic Growth and Money Supply Data

I have obtained China's economic growth rate data and the statistical data of money supply M2 in the past 16 years from public information channels. The specific situation in the summer is as follows:

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Table 1. GDP growth rate and M2 increase rate

time	GPD growth rate(G)	M2 increase rate(M)		time	GPD growth rate(G)	M2 increase rate(M)
Mar-2008	11.50%	16.19%		Jun-2016	6.70%	11.80%
Jun-2008	11.20%	17.37%		Sep-2016	6.70%	11.50%
Sep-2008	10.60%	15.29%		Dec-2016	6.70%	11.30%
Dec-2008	9.70%	17.82%		Mar-2017	6.90%	10.12%
Mar-2009	6.40%	25.51%		Jun-2017	6.90%	9.10%
Jun-2009	7.30%	28.46%		Sep-2017	6.90%	8.98%
Sep-2009	8.50%	29.31%		Dec-2017	6.90%	8.07%
Dec-2009	9.40%	27.68%		Mar-2018	6.80%	8.20%
Mar-2010	12.20%	22.50%		Jun-2018	6.80%	8.00%
Jun-2010	11.40%	18.50%		Sep-2018	6.70%	8.30%
Sep-2010	10.90%	19.00%		Dec-2018	6.60%	8.10%
Dec-2010	10.60%	19.70%		Mar-2019	6.40%	8.60%
Mar-2011	10.20%	16.60%		Jun-2019	6.30%	8.50%
Jun-2011	10.10%	15.90%		Sep-2019	6.20%	8.40%
Sep-2011	9.80%	13.04%		Dec-2019	6.10%	8.70%
Dec-2011	9.50%	13.60%		Mar-2020	-6.80%	10.10%
Mar-2012	8.10%	13.40%		Jun-2020	-1.60%	11.10%
Jun-2012	7.90%	13.60%		Sep-2020	0.70%	10.90%
Sep-2012	7.80%	14.80%		Dec-2020	2.30%	10.10%
Dec-2012	7.90%	13.80%		Mar-2021	18.30%	9.40%
Mar-2013	7.90%	15.70%		Jun-2021	12.70%	8.60%
Jun-2013	7.70%	14.00%		Sep-2021	9.80%	8.30%
Sep-2013	7.80%	14.20%		Dec-2021	8.10%	9.00%
Dec-2013	7.80%	13.60%		Mar-2022	4.80%	9.70%
Mar-2014	7.40%	12.10%		Jun-2022	2.50%	11.40%
Jun-2014	7.40%	14.70%		Sep-2022	3.00%	12.10%
Sep-2014	7.30%	12.90%		Dec-2022	3.00%	11.80%
Dec-2014	7.30%	12.20%		Mar-2023	4.50%	12.70%
Mar-2015	7.00%	11.60%		Jun-2023	5.50%	11.30%
Jun-2015	7.00%	11.80%		Sep-2023	5.20%	10.30%
Sep-2015	6.90%	13.10%		Dec-2023	5.20%	9.70%
Dec-2015	6.90%	13.30%		Mar-2024	5.30%	8.30%
Mar-2016	6.70%	13.40%		Jun-2024	5.00%	6.20%

Date from Trading Economics and Wind information.

Due to the impact of the COVID-19 pandemic and the changes in interest rate trends in China and the United States, we found that although the money supply maintained a high growth rate, the economic growth rate continued to decline. Therefore, based on this judgment, I grouped the statistical data, the first set of data from June 2008 to December 2019, and the second set of data from March 2020 to June 2024, and conducted regression analysis on the two sets of data respectively.

According to Zhang Yongsheng's [2012] research on the relationship between money supply and economic growth, and Hu Yinyan's [2016] empirical analysis on the relationship between money supply and economic growth, it is found that there is a linear relationship between money supply and economic growth. I verified it according to their method, and conducted

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regression analysis with new data, which also found that there was an obvious linear relationship.

2.2. Linear Regression Analysis of Economic Growth and Money Supply

2.2.1. Linear Regression for 2008 to 2019

We can do linear regression model using the statistics above. For the data from June 2008 to December 2019, OLS regression was performed.

GPD growth Rate=β0+β1* M2 Increase Rate +ϵ. For short:

$G=\beta 0+\beta 1^{*} M2+\epsilon$

Based on the regression analysis, we get the equation for the model as follow:

$G=5.6954+0.1646 \cdot M$

R-squared: 0.275 (This indicates that about 27.5% of the variance in the GPD growth rate is explained by the M2 increase rate)

M2 Increase Rate: 0.1646 (For each 1% increase in the M2 increase rate, the GPD increase rate is expected to increase by approximately 0.165%)

95% Confidence Interval: [0.085, 0.244]

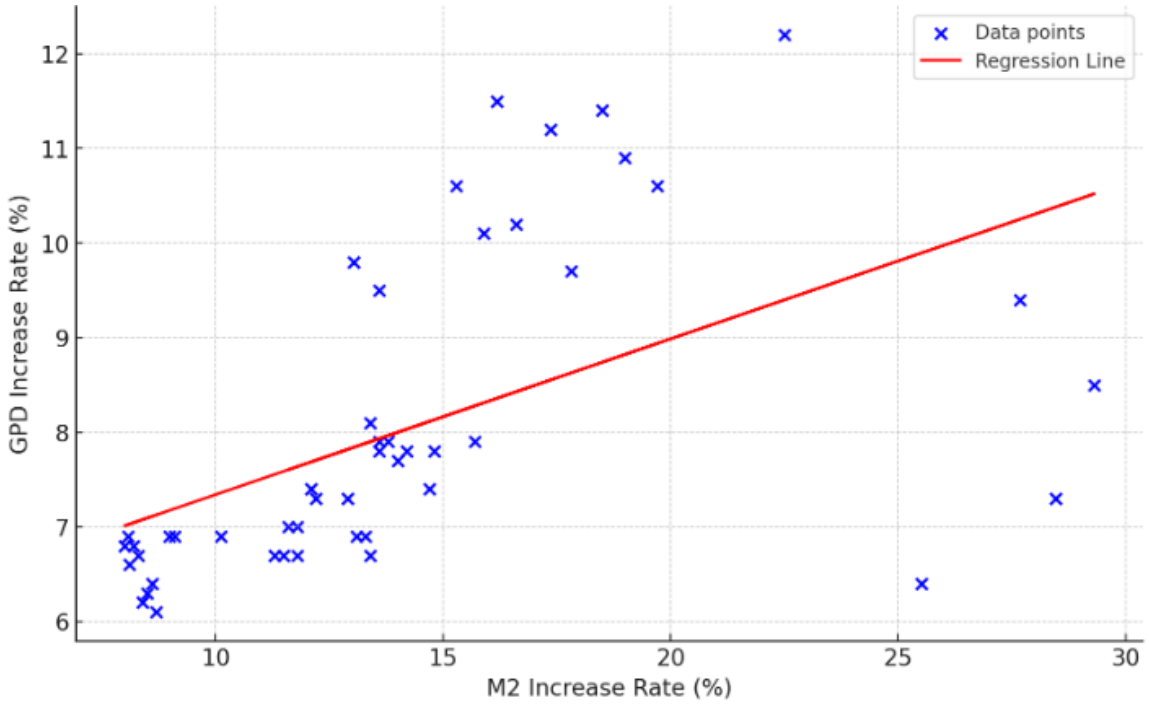

Figure 4. Linear Regression of GDP Growth Rate on M2 increase rate(2008-2019)
Data from Trading Economics

2.2.2. Linear Regression for 2020 to 2024

Using OLS regression again on the data from March 2020 to June 2024, we get the equation as follow:

$G=17.3015-1.2372 \cdot M2$

R-squared: 0.138 (This indicates that about 13.8% of the variance in the GPD increase rate is explained by the M2 increase rate)

M2 Increase Rate: -1.2372 (For each 1% increase in the M2 increase rate, the GPD increase rate is expected to decrease by approximately 1.237%)

95% Confidence Interval: [-2.875, 0.401]

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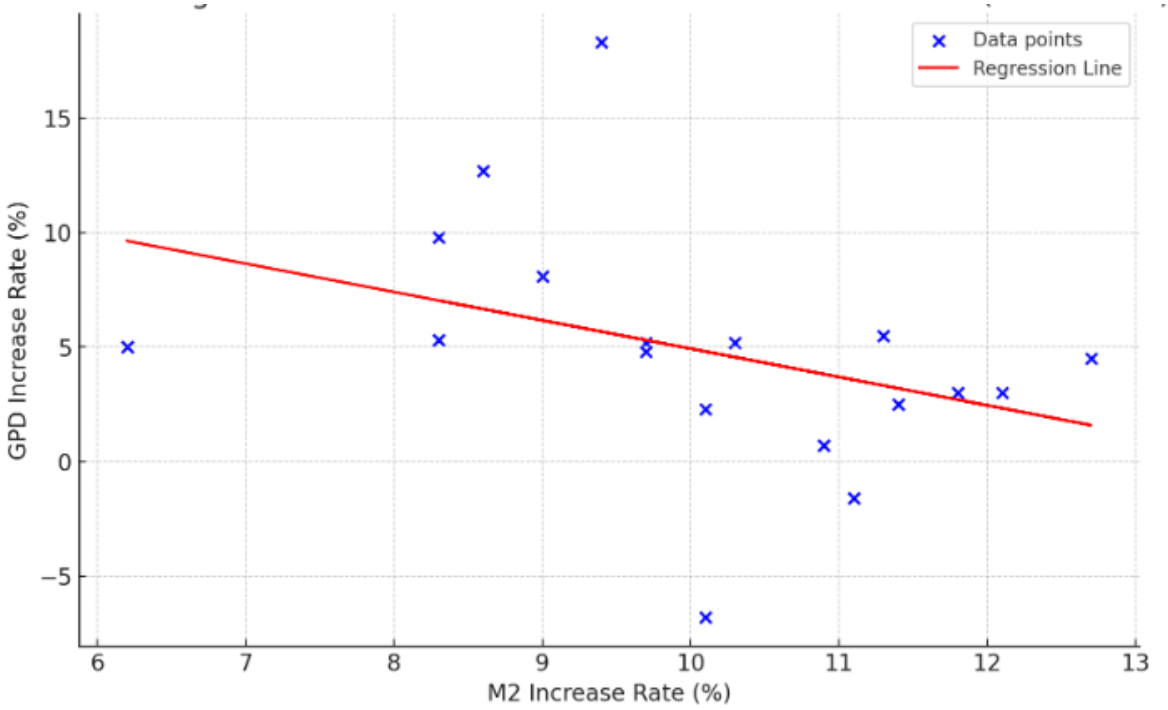

Figure 5. Linear Regression of GDP Growth Rate on M2 increase rate(2020-2024)
Data from Trading Economics

As far as we know, the second regression model is quite unreasonable. But it indicates that in the near four years, The effect of China's monetary policy has gone wrong, and the goal of promoting economic growth has not been achieved, which may also be due to the influence of external factors leading to the ineffective effect of monetary policy. So, I will continue to analysis the impact of interest rates in China and the US inverted.

3. The Impact of Interest Rate Inversion on Monetary Polic

The macroeconomic policy of a sovereign country mainly includes fiscal policy and monetary policy, and the monetary policy has the most direct and significant impact on the interest rate market. According to the monetarist theory, by increasing the money supply, the government can increase the market demand, thus promoting the increase of market supply, thus promoting economic growth and improving the employment level. Both Keynesianism and New Keynesianism advocate government intervention in decision-making by the government. However, China is a country that attaches great importance to macro-control, so Keynesianism and New Keynesianism play an important role in the minds of China's macro-policy makers. Keynesianism believes that the government should enhance market demand through the combination of fiscal policy and monetary policy. Can promote economic growth and achieve full employment. As Keynes himself put it in the General Theory: "In the analysis of the theory of employment, I advocate the use of two basic units of measurement, namely, the amount of money value and the amount of employment." A series of innovative theories in the late 1870s and early 1880s led directly to the first generation of new Keynesian models that explained the interaction of monetary policy and the real economy. These innovative theories include menu cost theory and intertemporal wage and cost theory (Fischer, 1977; Calvo, 1983; Taylor, 1979), new approaches to solving linear and nonlinear models involving rational expectations and good estimation of these models using utility maximization models (Hansen and Sargent, 1980: Fair and Taylor, 1983). These monetary research methods are applied to the actual monetary policy analysis of central banks.

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However, in my daily investment business management, I found that compared with the past, the implementation of China's monetary policy is less effective than expected. Many academic studies have predicted that after the epidemic, China's economy will resume rapid growth and pent-up consumer demand will also explode. However, actual economic growth did not meet expectations, and consumer sales confidence did not increase, but fell to a lower level.

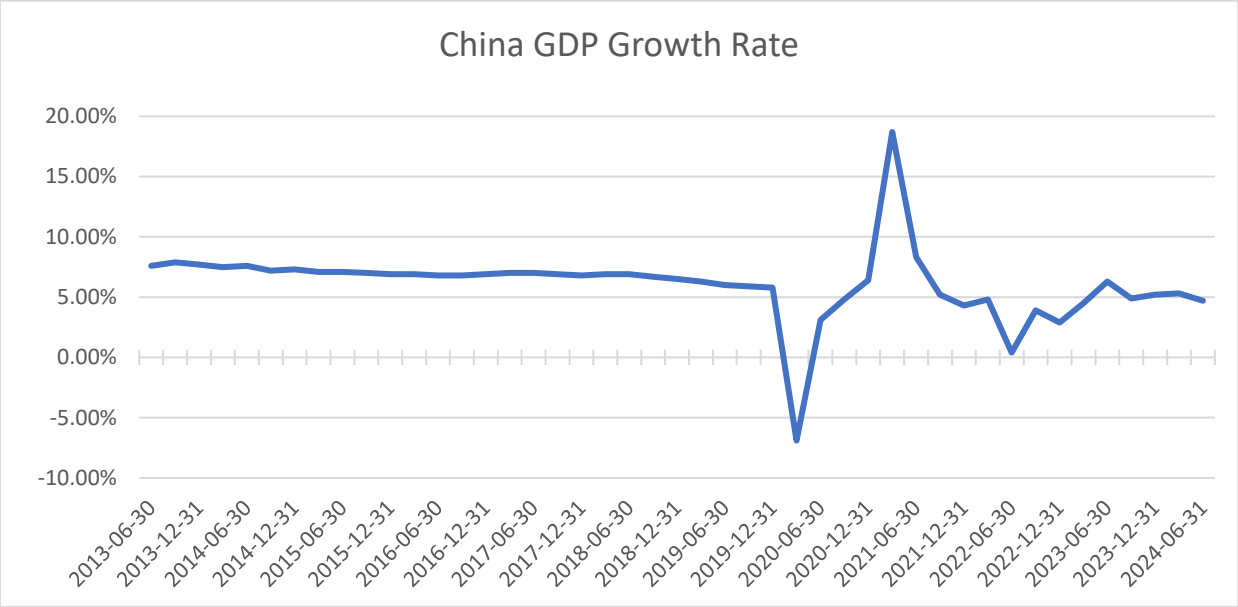

Figure 6. China GDP Growth rate
Data from Wind information

China's year-on-year GDP growth has formed a downward trend, the world economy began to recover growth in 2022, the US economy is stronger growth, while China's annual economic growth in 2024Q2 is 5%, becoming the slowest growth rate in nearly 40 years. And it has yet to see a return to a high level growth rate.

The wide interest rate differential between China and the US is affecting the transmission of China's monetary policy:

3.1. The Signal Role of Monetary Policy Has been Seriously Weakened.

Interest rate is an important tool for monetary policy to transmit to the economic field, but the interest rate inversion has weakened the guiding role of interest rate for market players to market expectations. Economic growth has not been effectively stimulated, on July 15, 2024, the Chinese government announced that the economic growth rate in the second quarter was 4.7%, which is a decline from the previous quarter.

3.2. Capital Driven by Profit Spillover.

The sharp deviation of interest rates leads to the flow of funds in fixed-income products of equal risk in China and the United States, and funds continue to stay in the higher yield of the United States market.

3.3. The Motivation of Long-term Investment is Weakened.

the continuous high interest rate spread strengthens the set motivation of fund managers, and the cross-market arbitrage becomes risk-free return and the expectation of arbitrage, so they are unwilling to extend the investment period, affecting the implementation effect of monetary policy, and also leading to the expansion of the volatility of the bond market.

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Historically, when the economy was declining, after the implementation of active monetary policy, monetary policy could be transmitted to the economy relatively quickly and promote economic growth in about half a year to one year.

It has been about two years since the interest rate of the United States exceeded that of China, and the adjustment effect of China's monetary policy has become less and less satisfactory. The central bank has cut interest rates, reduced deposit reserves, and implement active monetary policies through open market operations, etc. However, China's economic growth is still weak, and the economic growth rate has not improved, but there is a trend of further decline.

4. Analysis of The Causes of MonetaryPolicyFailure

4.1. Supply Chain Changes

During the epidemic period, the world economic supply chain has undergone obvious changes, and the trend of diversified supply is obvious. Multinational companies in the world continue to promote diversified raw material procurement, avoiding the risk of single supply and reducing the demand for China's single procurement.

4.2. The Profit-oriented Flow of Capital Continues to Increase

The profit-oriented motive of short-term funds increases and flows to the high-interest market; Demand for the risk-free yield of long-term money is also gradually flowing to high-yield markets overseas.

4.3. The Foreign Exchange Inflow Caused by Foreign Trade Slows Down

China's international trade exports have an afternoon trend, and the foreign exchange income of enterprises decreases. On the other hand, the profit motive is that enterprises delay the payment of foreign exchange into RMB and keep the funds in the high-yield foreign market in order to obtain interest and exchange rate income.

4.4. The Overall Return on Investment of the Whole Society Has Declined

The willingness of business owners to expand investment has weakened, resulting in monetary growth failing to promote credit growth. The policy orientation based on monetary policy and supplemented by fiscal policy is not suitable for the current social environment.

5. Conclusion and Future Expectation

5.1. On China's Monetary Policy

China will continue to maintain a relatively loose monetary policy by increasing the money supply to reduce the financing cost of the economy and promote enterprises to increase investment, so as to maintain economic growth and the desired level of employment. In the long run, Chinese government bond yields are expected to continue to fall and may even hit zero. This trend stems from the decline in natural interest rates, resulting in the whole society facing an "asset shortage", limited investment opportunities in the stock market, and domestic funds that cannot freely flow internationally will continue to flow into the bond market.

5.2. Capital Outflow and Exchange Rate Pressure

Until interest rate differentials do not change, capital outflows will continue, putting continued depreciation pressure on the renminbi. The Chinese government will pay closer attention to the movement of the RMB exchange rate, smooth the depreciation trend of the RMB and reduce the depreciation pressure through appropriate market operations, so as to avoid economic and financial risks caused by drastic movements.

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5.3. On Inflationary Pressure

China faces the risk of continued accumulation of inflationary pressure, and there is the possibility of high inflation for some time to come. The loose monetary policy of the central bank has caused the supply of money in circulation to exceed the demand to some extent, and the growth of the money supply will gradually translate into inflationary pressure over time.

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