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China's Implementation of Interest Rate Corridor Regulation and its Impact on Interest Rate Fluctuations

Manfei Zhang

School of Economics and Management, XIDIAN University, 266 Xinglong Section of Xifeng Road, Xi'an, Shaanxi 710126, China
363455809[at]qq.com

Abstract: ***At present, China's monetary policy regulation has changed from a quantity-based to a price-based approach, and the interest rate corridor, as an important monetary policy regulation mechanism, can effectively promote the transformation of monetary policy from a quantity-based to a price-based one. This article empirically analyzes the changes of interest rate fluctuations in the money market before and after the establishment of the interest rate corridor. The results show that the construction of the interest rate corridor reduces the volatility of inter-bank lending rates to a certain extent. On this basis, it puts forward policy recommendations to improve my country's interest rate corridor control mechanism.***

Keywords: Interest rate corridor; Money market interest rate; Money market interest rate

1. Introduction

Since the 1980s, the monetary policy control methods of many countries in the world have been gradually transforming, that is, from the traditional quantitative control to the price control. The "interest rate corridor" is precisely the new mode of monetary policy regulation that emerged during this transition. Regarding the theoretical aspects of interest rate corridors, scholars at home and abroad have done a lot of research. This article draws on and learns from the advanced experience of the construction of interest rate corridors in various countries, and uses the establishment of AR(1)-GARCH(1,1) model to empirically analyze my country's short-term money market interest rates based on whether the interest rate corridor can reduce short-term interest rate fluctuations. Distribution characteristics and interest rate volatility in the two stages before and after the establishment of the interest rate corridor.

2. Construction of China's interest rate corridor

At present, my country's socialist market economy has entered a new era, and the reform of the economic system has entered a deep water zone. The "Outline of the Thirteenth Five-Year Plan for the National Economic and Social Development of the People's Republic of China" clearly states "Improve the operational objectives, regulatory framework, and transmission mechanism of monetary policy, build a target interest rate and interest rate corridor mechanism, and promote monetary policy from a quantitative approach. Price-oriented transformation".

In order to further realize the transformation of monetary policy regulation, cultivate policy interest rates, and enhance the market pricing power of the capital market, the People's Bank of China established the Standby Lending Facility (SLF) in 2013, and established an "interest rate corridor" through this monetary policy operation tool. Standing lending facility (loan to the central bank) as the upper limit of the "interest rate corridor", the central bank's excess deposit reserve ratio as the deposit reserve ratio as the lower limit of the "interest rate corridor", and the Shanghai Interbank Offered Rate (hereinafter referred to as "SHIBOR") as the lower limit Benchmark interest rate: In 2015, we improved the assessment method of deposit reserve, implemented the "double average" assessment method, and tried to cultivate SLF as the upper limit of the interest rate corridor. In February 2019, the People's Bank of China formally proposed the "preliminary establishment of interest rate corridors." During this period, interest rates fluctuated steadily. Only during the Spring Festival of 2019, there were relatively large fluctuations. The Central Bank's Standing Lending Facility (SLF) operation scale expanded accordingly, and the market The structural contradiction of funds has been eased. The initial establishment of the interest rate corridor is an important part of my country's interest rate market-oriented reforms, and is a key step in realizing the transition of monetary policy from quantitative control to price-based control.

3. Empirical analysis

3.1 Data source and statistical description

This article selects the Shanghai Interbank Interbank Offered Rate (SHIBOR) from October 8, 2006 to June 24, 2020 for time series analysis. The data comes from the official website of Shanghai Interbank Offered Rate (http://www. shibor. org/). Considering that the central bank began to explore the interest rate corridor regulation mechanism at the end of 2013, this article divides the empirical data into two time periods. The first time period is from October 8, 2006 to December 31, 2013, indicating that the interest rate corridor is established before; the second time period is from January 4, 2014 to June 24, 2020, which means after the establishment of the interest rate corridor. First, perform descriptive statistics on the data of these two time periods.

From the results in Table 1, it can be seen that the average value of the overnight call rate before the implementation of the interest rate corridor (2.3574) is significantly higher than the average value of the overnight call rate after the implementation of the interest rate corridor (2.29173); the standard deviation of the overnight call rate before the implementation of the interest rate corridor (1.1526) is the implemented interest rate The standard deviation of the overnight lending rate after the corridor (0.568957) is twice, the range of the overnight lending rate before the implementation of the interest rate corridor (12.6432) is also significantly higher than the range of the overnight lending rate after the implementation of the rate corridor (4.1867), and the overnight before the implementation of the interest rate corridor The coefficient of variation of the lending rate (48.89%) is twice that of the overnight lending rate (24.83%) after the implementation of the interest rate corridor.

Table 1: Basic statistics

Statistics	*Before the establishment of the interest rate corridor (2006.10-2013.12)*	*After the establishment of the interest rate corridor (2014.1-2020-6)*
Mean	2.3574	2.2917
Standard deviation	1.1526	0.5689
Maximum value	13.444	4.8477
Minimum value	0.8008	0.661
Coefficient of variation	48.98%	24.83%

It can be seen from Figure 1: 2006.10-2020.6 Shanghai Interbank Offered Rate (SHIBOR) fluctuated violently during a certain period of time, but remained relatively stable during another period of time. It can also be seen from the trend chart (Figure 2) that the volatility of the Shanghai Interbank Offered Rate (SHIBOR) is concentrated: when the interest rate fluctuations in the current period or the previous period are relatively large, the interest rate volatility in the future period will also be large. Conversely, when the interest rate volatility in the current period or the previous period is relatively small, the interest rate volatility in the future period will be relatively small. Figure 2 shows that it is relatively stable. Therefore, the Shanghai Interbank Offered Rate (SHIBOR) has a certain degree of positive inertia. Therefore, the values with large variance are clustered together, and the values with small variance cluster together.

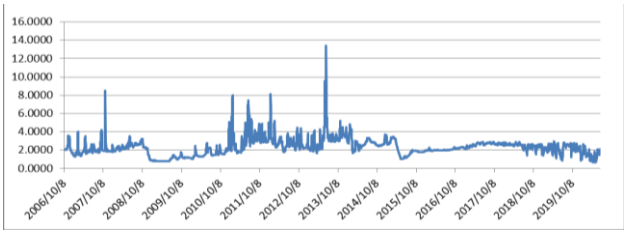

Figure 1: Shibor trend chart

3.2 Unit root test

In order to avoid the existence of unit roots in the two independent variables in the time series, leading to false regressions in the empirical analysis, before the empirical analysis, the unit root test and stationarity of the Shanghai Interbank Offered Rate (SHIBOR) data from October 2006 to 2020.6 were carried out test. This study uses the ADF test. The ADF test ensures that the disturbance has no autocorrelation by introducing a high-order lag term. The original hypothesis of the ADF test is that there is a unit root, and the alternative hypothesis is a stationary sequence. This paper uses Eviews measurement analysis software to carry out ADF inspection results as shown in Table 2.

Table 2: ADF inspection result

Variable	*ADF statistics*	*1% critical value*	*P value*
Mean	-7.792527	-3.433759	0.000
Standard deviation	-5.051114	-3.434202	0.000

The test results of the ADF statistics in Table 2 show that the Shanghai Interbank Offered Rate (SHIBOR) data rejects the null hypothesis at the 1% level. The null hypothesis is that there is a unit root. Therefore, it can be considered that the Shanghai Interbank Offered Rate (SHIBOR) does not contain a unit root, and the sequence is considered to be stable. The autocorrelation (AC) and partial autocorrelation (PAC) diagrams of the SHIBOR sequence are given below.

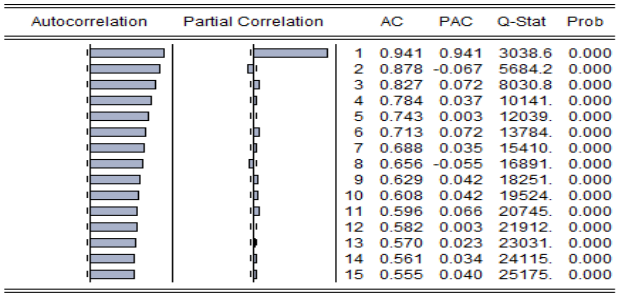

Figure 2: Autocorrelation (AC) and Partial Autocorrelation (PAC) of SHIBOR series

It can be seen from Figure 2 that the autocorrelation SACF of the SHIBOR series exhibits tailing characteristics, and the partial autocorrelation PACF appears tailing characteristics from the second period, which indicates that the AR(p) model is used to describe the Shanghai Interbank Offered Rate (SHIBOR).) The timing characteristics are more reasonable. The closing probability of the Q statistic is 0.000 in each period, indicating that at a significance level of 1%, the null hypothesis "there is no autocorrelation" can be rejected. According to the AIC and BC criteria, the lag order is 1 order, so the AR (1) model is established to characterize SHIBOR.

3.3 Empirical model and results

According to the unit root test results, the Shanghai Interbank Offered Rate (SHIBOR) does not have a unit root during 2009-2019, and the data is relatively stable, but there is a clear convergence of volatility in the data from 2006 to 2020. The financial data used is all time series, and the data presents the characteristics of skewness and "after the peak". Aiming at the financial data with the above characteristics, using the GARCH (1,1) model that adds the autoregressive part of the interest rate variance on the basis of ARCH, analyzes the volatility of interest rates and proposes two null hypotheses:

Hypothesis 1: Assume that interest rates have the characteristics of volatility clustering, and observations with large variances are clustered.

Hypothesis 2: Implementing interest rate corridor regulation can reduce the volatility of money market interest rates.
The estimation result of the AR(1) model: the fluctuation of the random disturbance term has obvious temporal variability and clustering, and the ending probability of the Q statistic is 0.000 in each period, and the residual sequence has significant autocorrelation, which is suitable Use GARCH model to model.

In order to verify whether the OLS residual has an ARCH effect, it is necessary to perform an LM test on the OLS residual. The results of the LM test of the Shanghai Interbank Offered Rate (SHIBOR) from 2006 to 2020. It can be seen that the P values of the F statistic and the n*R2 statistic of the LM test are both significantly less than 0.05, and unconditional heteroscedasticity is rejected. Therefore, it is believed that SHIBOR has a conditional heteroscedasticity effect. The GARCH (1, 1) function can well describe the conditional heteroscedasticity characteristics of volatility, so this article uses the AR(1)-GARCH(1,1) model to fit the SHIBOR sequence.

Through the test, autocorrelation graph, partial autocorrelation graph, and LM test on the Shanghai Interbank Offered Rate from October 2006 to 2020.6, the test results all show that the Shanghai Interbank Offered Rate (SHIBOR) has volatility clusters , So hypothesis one holds, interest rates have the characteristics of volatility clustering, and observations with large variances are clustered.

In order to verify Hypothesis 2, this study uses the GARCH (1,1) model for the data before the implementation of the interest rate corridor (2006.10-2013.12) and after the implementation of the interest rate corridor (2014.1-2020.6), and compares the data before and after the implementation of the interest rate corridor. To prove whether the volatility of the Shanghai Interbank Offered Rate (SHIBOR) has decreased after the implementation of the interest rate corridor regulation.

Table 3: GARCH (1, 1) estimation results of overnight SHIBOR before and after the implementation of the interest rate corridor in China

Variable	*2006.10-2013.12*	*2014.1-2020.6*
C	0.3023	0.0477
AR(1)	0.9782	0.9768
C	0.0067	0.0035
ARCH(1)	0.8053	1.0556
GARCH(1)	0.5266	0.4981
P value	0.0000	0.0000
Observations	1812	1550

According to the estimated results of GARCH (1, 1) in Table 3, the estimated results after the implementation of the interest rate corridor (2014.1-2020.6) are lower than the estimated results before the implementation of the interest rate corridor (2006.10-2013.12). After my country implemented interest rate corridor regulation, the fluctuation of the Shanghai Interbank Offered Rate (SHIBOR) was lower than before the implementation of the interest rate corridor regulation. Therefore, the interest rate corridor regulation can reduce the volatility of money market interest rates. Therefore, Hypothesis 2 holds.

4. Conclusions and policy recommendations

Through an empirical study of the Shanghai Interbank Offered Rate (SHIBOR) from 2006 to 2020, it can be found that the regulation of interest rate corridors can reduce the volatility of money market interest rates to a certain extent and enhance the stability of interest rates. However, according to the current implementation of my country's interest rate corridors, there are some areas that need to be improved in the construction of China's interest rate corridors. For example, my country's interest rate corridors are too wide and have obvious asymmetry characteristics. ,

In order to realize the transition of my country’s monetary policy framework from quantity to price, the central bank should take measures to actively improve the interest rate corridor mechanism: gradually narrow the range and width of the interest rate corridor, and rationally adjust and set the upper and lower limits of the interest rate corridor, so that the upper and lower limits can be fully utilized. There is a role. Compared with open market operations, the cost of interest rate corridor regulation is relatively low. In the future, my country's interest rate corridor regulation mechanism should coordinate with open market operations, and further improve the efficiency of currency regulation. The central bank "cuts peaks and fills valleys" through daily open market operations. Accurately adjust market liquidity to ensure that the interest rate corridor equilibrium mechanism can be effectively realized. At the same time, give full play to the role of the upper and lower limits of the interest rate corridor in responding to "unexpected shocks" and stabilizing market expectations, and more effectively conduct market interest rate expectations guidance.

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