

Comparison Between Quantity-based and Price-based Monetary Policies in China under the Background of Interest Rate Liberalization

Ao Wang

Economics and Management School of Wuhan University, Wuhan, 430000, China

Abstract: Monetary policy serves as a crucial means for the country to regulate the macroeconomy and maintain financial stability. In the context of interest rate liberalization, it is of great significance to explore the transmission mechanism and effectiveness of China's monetary policy. Using the Vector Error Correction Model (VECM), this paper takes 2016 as a key demarcation point and analyzes different periods against the backdrop of interest rate liberalization. The research finds that with the advancement of interest rate liberalization, the regulatory capabilities of both price-based and quantity-based monetary policies have been continuously strengthened. In terms of output, appropriately implemented price-based monetary policy exhibits superior regulatory effects, while quantity-based policy performs better in maintaining price stability. This implies that China cannot yet abandon quantity-based intermediary targets at this stage.

Keywords: Interest rate liberalization, Quantity-based monetary policy, Price-based monetary policy, VECM.

1. Introduction

At different stages of economic development, to achieve the ultimate goal of maintaining currency stability and thereby promoting economic growth, the central bank needs to make discretionary decisions in formulating different monetary policies. Monetary policy tools can be divided into two categories: quantity-based and price-based. Quantity-based monetary policy conducts macroeconomic regulation by directly controlling the money supply, while price-based monetary policy conducts indirect regulation by influencing market interest rates. China's monetary policy has primarily been quantity-based, but with the wave of financial innovation and the continuous development of financial markets, various emerging financial instruments and products have continually emerged, and the business models of financial institutions have become increasingly diversified and complex. The monetary hierarchy has exhibited unprecedented complexity. The traditional boundaries for dividing monetary hierarchy have gradually become blurred, and the previously relatively clear definitions of currency forms such as cash, demand deposits, and time deposits are now impacted by numerous new financial businesses. The complexity and ambiguity in the classification of monetary hierarchy have made the control and measurement of M2 increasingly difficult. Therefore, China's monetary policy is shifting towards a price-based monetary policy.

Interest rates are essentially the price of capital. In theory, the faster a country's economic development and the greater the investment returns, the higher its interest rates should be. However, China has long experienced the phenomenon of high economic growth accompanied by low interest rates, primarily due to the long-term regulation of interest rates in the country. As China's economy has developed, the drawbacks of this regulation have gradually become apparent. Interest rate regulation has harmed household property income, as lower deposit interest rates have resulted in lower interest income for Chinese residents, placing them at a disadvantage in income distribution. Due to the long-term

implementation of interest rate regulation, China's loan interest rates are significantly lower than market rates, leading to low loan costs, which in turn continuously stimulate investment behavior. However, this reduction in household interest income leads to decreased household disposable income and consumption, resulting in structural imbalances on the demand side in China. To overcome interest rate regulation, the scale of shadow banks has continuously expanded, exacerbating China's financial risks. To address these issues, interest rate liberalization is imperative.

Interest rate liberalization refers to the process by which financial institutions independently determine deposit and loan interest rates based on market supply and demand. Liberalization is a concept relative to regulation, and its essence lies in shifting the power to discover and determine equilibrium interest rates in financial markets from the central bank to financial institutions as market entities. In this context, interest rates will be primarily determined by the supply and demand dynamics of the financial market, with the market playing a fundamental role in the formation of interest rates. The central bank indirectly regulates benchmark interest rates through various market-oriented policy tools and exercises effective influence on interest rate levels and structures to achieve the objectives of monetary policy regulation [2].

Drawing lessons from the experience of interest rate liberalization in Western countries, it is observed that monetary policy also undergoes changes as the interest rate market progresses. In the 1970s, due to interest rate regulation, the United States struggled to address high inflation and high interest rates simultaneously. Against this backdrop, the United States began gradually implementing interest rate liberalization, a process that often accompanies shifts in monetary policy. With the continuous emergence of financial innovations, the definition of money became difficult, and the controllability, measurability, and relevance of monetary policy intermediate targets were significantly weakened. As a result, the Federal Reserve shifted its monetary policy intermediate target from money supply to the federal funds rate.

Table 1 details the main stages and contents of China's interest rate liberalization process. In 1993, the CPC Central Committee and the State Council set the goals and tasks for interest rate liberalization, marking the beginning of this process. In 1996, the liberalization of the interbank lending rate indicated China's entry into the stage of market-oriented monetary market interest rates and floating loan interest rates. In 1999, Chinese commercial banks piloted large-scale time deposits with interest rates determined through negotiation with Chinese insurance companies, ushering in a period

where loan interest rates were fully liberalized and deposit interest rates began to float. In 2015, an interest rate corridor was established, with the standing lending facility rate as the upper limit and the excess reserve requirement rate as the lower limit. During this period, China's interest rate liberalization process reached 94.68%, essentially completing the liberalization of interest rates. Therefore, this paper selects 2016 as the key time point for the completion of interest rate liberalization.

Table 1. Main stages and contents of China's interest rate liberalization process

Stage	Time	Content
Liberalization of money market interest rates and floating loan interest rates	1993	The CPC Central Committee and the State Council established the goals and tasks for interest rate liberalization reform.
	1996	Liberalized interbank lending rates.
	1997	Liberalized interbank bond repo rates.
	1998	Initiated market-based interest rate issuance for securities.
	1999	Expanded the floating range of loan interest rates multiple times.
Full liberalization of loan interest rates and floating deposit interest rates	1999	Chinese-funded commercial banks piloted large-scale time deposits with interest rates determined through negotiation with Chinese-funded insurance companies.
	2002	Implemented county/city-level pilot projects for rural credit cooperatives to float loan interest rates.
	2003	Liberalized the management of interest rates for some small foreign currency deposits.
	2004	Fully liberalized the upper limit on RMB loan interest rates.
	2005	Fully liberalized the upper limit on RMB loan interest rates.
	2007	Shanghai Interbank Offered Rate (Shibor) went into operation.
	2012	Increased deposit interest rate float ceiling to 110% and lowered loan interest rate floor to 70%.
Establishment of interest rate corridor and Loan Prime Rate (LPR) quotation mechanism	2013	Fully liberalized loan interest rates and removed controls on bill discount rates.
	2014	Officially proposed the concept of an interest rate corridor mechanism.
	2015	Established an interest rate corridor with the standing lending facility rate as the upper limit and excess reserve requirements as the lower limit.
	2019	Loan Prime Rate (LPR) mechanism was officially implemented.

The advancement of interest rate liberalization has enhanced the role of interest rates as a core tool for resource allocation and diversified the transmission channels of monetary policy. However, in practical operation, there is debate about the transmission effectiveness of quantity-based and price-based monetary policies. Therefore, studying the transmission mechanisms and effectiveness of quantity-based and price-based monetary policies in the context of interest rate liberalization can contribute to enriching relevant theories. Under conditions of interest rate liberalization, how to achieve effective coordination between quantity-based and price-based monetary policies is an important issue for economic regulation. This paper helps to understand the applicability of both types of policies in different economic environments.

2. Model Selection and Data Description

2.1. Model Selection

2.1.1. Vector Autoregressive Model (VAR)

Traditional econometric methods are grounded in specific economic theories, requiring the determination of causal relationships among different variables based on certain economic relationships when constructing models. However, when the relationships among variables are complex and involve dynamic interactions, traditional econometric models may exhibit deficiencies. To investigate the impact of quantity-based and price-based monetary policies on various

macroeconomic variables in the context of interest rate liberalization, this paper employs the Vector Autoregressive (VAR) model for analysis. The VAR model considers all dynamic relationships among variables, providing a feasible analytical tool when theoretical foundations are unclear. The basic form of the VAR model is as follows:

$$Y_t = \mu + \Pi_1 Y_{t-1} + \Pi_2 Y_{t-2} + \dots + \Pi_k Y_{t-k} + \varepsilon_t$$

Here, Y_t is a $k \times 1$ time series column vector; μ is a constant column vector; Π_i is a $k \times k$ coefficient matrix representing the influence of lag period i , and ε_t is a $k \times 1$ random error column vector.

2.1.2. Vector Error Correction Model (VECM)

Since the establishment of a VAR model requires the stationarity of variables, using non-stationary variables for modeling can lead to the problem of spurious regression. One way to address this issue is by differencing the non-stationary variables to make their differenced sequences stationary and then regressing on these differenced sequences. However, this approach results in the loss of information regarding the long-term relationships between variables. By using cointegration relationships to establish a Vector Error Correction Model (VECM), it is possible to combine both long-term relationships and short-term characteristics within a single model. This not only resolves the spurious regression problem but also minimizes the loss of information. The basic form of the VECM is:

$$\Delta Y_t = \Pi_1 Y_{t-1} + \Gamma_1 \Delta Y_{t-1} + \dots + \Gamma_{k-1} \Delta Y_{t-(k-1)} + \varepsilon_t$$

In the VAR model of this paper, $Y_t = (HP, GDP, SHIBOR, M2, CPI, SSEC, RE)$

2.2. Data Selection and Description

The model in this paper includes two monetary policy variables: interest rates and money supply. There are a total of five macroeconomic variables, including stock market prices, housing prices, production, inflation, and exchange rate index.

For the selection of interest rate indicators within price-based monetary policy, due to the high degree of liberalization of the interbank offered rate, this paper adopts the 7-day Shanghai Interbank Offered Rate (SHIBOR) as its proxy variable. Regarding monetary supply indicators, which primarily include M0, M1, and M2, M2 is chosen as the proxy variable in this paper due to its better representation of monetary supply conditions, and its logarithm is taken for smoothing. The Shanghai Stock Exchange Composite Index (SSEC) is used to represent stock market prices. For housing prices (HP), the residential sales price index of 70 large and

medium-sized cities is selected as the proxy variable, and the month-on-month data is converted to a fixed-base series. Gross Domestic Product (GDP) is chosen to represent production. For inflation, the Consumer Price Index (CPI), which has a higher correlation with residents, is selected, and its month-on-month data is also converted to a fixed-base series. The Real Effective Exchange Rate Index (RE) of the RMB is chosen to represent the exchange rate.

The data selected in this paper consist of monthly data spanning from January 2009 to September 2024. January 2016, which marks the substantial completion of the interest rate liberalization reform, is chosen as the dividing line to separate the sample into two groups. Within each group, CPI and HP are converted to a fixed-base series, with the base period set at 100. The data sources for this paper include CSMAR, Wind Database, and the National Bureau of Statistics of China. Table 2 provides detailed descriptions of each dataset.

Table 2. Data description

Variable name	Variable symbol	Meaning	Unit
7-day Shanghai interbank offered rate	SHIBOR	It refers to the interest rate for 7-day term funds lent among financial institutions in the Shanghai Interbank Funding Market. It is a market-based interest rate indicator that reflects the supply and demand for funds and liquidity conditions in the interbank market.	%
Shanghai Stock Exchange Composite Index	SSEC	It reflects the changes in stock prices listed on the Shanghai Stock Exchange, officially released since July 15, 1991.	/
Residential sales price index of 70 large and medium-sized cities	HP	Compiled by the National Bureau of Statistics, it is a relative indicator reflecting the trend and degree of change in residential sales prices in 70 large and medium-sized cities.	/
Real effective exchange rate index of RMB	RE	After eliminating inflation factors, it is the weighted average of the bilateral nominal exchange rates between the RMB and the currencies of trading partner countries calculated based on trade weights, used to measure the actual comprehensive exchange rate level and competitiveness of the RMB in international trade.	/
Gross domestic product	GDP	The total final output of production activities within a certain period by all resident units in a country or region.	Billion Yuan
Consumer price index	CPI	It is a macroeconomic indicator reflecting changes in the price levels of consumer goods and services generally purchased by households.	/
Broad money supply	M2	It refers to the sum of cash circulating outside the banking system plus corporate deposits, residential savings deposits, and other deposits.	Billion Yuan

2.3. Data Preprocessing

This paper aims to demonstrate the effects of quantity-based and price-based monetary policies at an absolute level to facilitate economic interpretation of the results. Therefore, the month-on-month data for CPI and HP are converted to a fixed-base series. For the sample period from 2009 to 2015, January 2009 is taken as the base period for fixed-base processing; for the sample period from 2016 to 2024, January 2016 is taken as the base period. Since GDP data is quarterly, this paper converts GDP quarterly data to monthly data using linear interpolation. Due to the large magnitude of M2 and

GDP data, logarithms are taken for smoothing. Additionally, since SHIBOR and GDP exhibit obvious seasonality, seasonal adjustment is performed on these variables in this paper.

3. Empirical Testing and Analysis

3.1. Descriptive Statistics

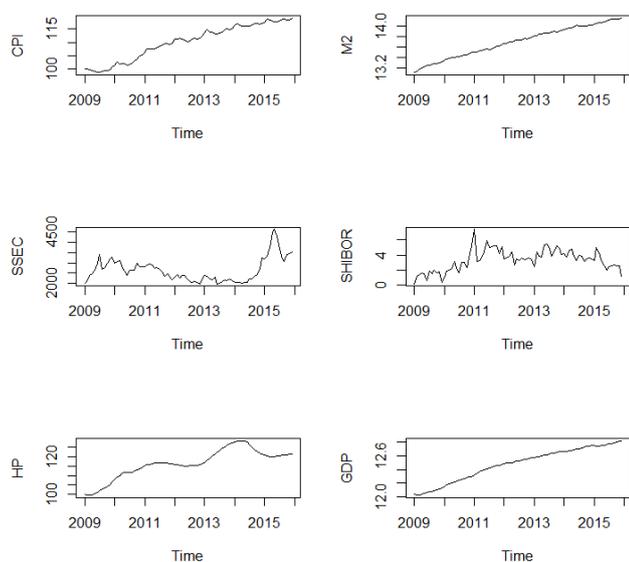
The following tables present the descriptive statistics of the variables after preprocessing in this paper. Table 3 shows the descriptive statistics for the 2009-2015 subsample, Table 4 shows the descriptive statistics for the 2016-2024 subsample, and Figure 1 illustrates the variable sequences.

Table 3. Descriptive statistics for the 2009-2015 subsample

Variable	Sample size	Mean	Standard deviation	Median	Minimum	Maximum
SHIBOR	84	3.3231	1.47	3.2775	0.9354	8.2192
SSEC	84	2643	574.56	2473	1979	4612
HP	84	116.45	7.66	116.55	99.63	128.63
GDP	84	12.47	0.52	12.52	11.20	13.44
CPI	84	110.09	6.54	111.33	98.71	118.98
M2	84	13.70	0.29	13.73	13.11	14.15
RE	84	110.8	10.58	108.6	95.6	131.0

Table 4. Descriptive statistics for the 2016-2024 subsample

Variable	Sample size	Mean	Standard deviation	Median	Minimum	Maximum
SHIBOR	105	2.39	0.36	2.35	1.52	3.07
SSEC	105	3126	251.23	3105	2494	3640
HP	105	131.1	14.07	137.1	100	146.5
GDP	105	13.15	0.49	13.18	11.97	14.05
CPI	105	108.5	4.74	110.0	100	114.8
M2	105	14.56	0.23	14.56	14.16	14.95
RE	105	118.0	13.36	122.6	91.1	132.7

**Figure 1.** Processed variable sequences diagram

3.2. Stationarity Test

To prevent the spurious regression caused by modeling

with non-stationary variables, a stationarity test is required for each variable in both sample periods before using the VAR model. In this paper, the ADF test is employed for unit root testing, and it is found that all variables have unit roots in both stages.

3.2.1. Stationarity test based on the 2009-2015 subsample

The following table presents the results of the unit root test for the 2009-2015 subsample. It can be observed that at the significance levels of 1% and 5%, all variables in the sample without differencing are non-stationary sequences. After first-order difference, at the 5% significance level, all variables are stationary sequences. At the 1% significance level, all variables except HP are stationary sequences. Given that all variables in the subsample spanning 2009–2015 are found to be first-order integrated at the 5% significance level, a cointegration test is required to examine the long-term cointegration relationships among them. If cointegration exists, a VECM should be constructed to reduce information loss. In the absence of cointegration, differencing the variables to achieve stationarity is necessary before estimating a VAR model.

Table 5. Results of unit root test for the 2009-2015 sample

Variable	Test form	1% critical value	5% critical value	10% critical value	ADF test value	Stationarity status
SHIBOR	(0, 0, 3)	-2.6	-1.95	-1.61	-0.4344	Non-stationary
dSHIBOR	(C, T, 2)	-4.04	-3.45	-3.15	-8.2535	Stationary
SSEC	(0, 0, 1)	-2.6	-1.95	-1.61	-0.1905	Non-stationary
dSSEC	(C, T, 1)	-4.04	-3.45	-3.15	-6.9458	Stationary
HP	(0, 0, 2)	-2.6	-1.95	-1.61	0.6352	Non-stationary
dHP	(0, 0, 1)	-2.6	-1.95	-1.61	-2.1834	Stationary
RE	(0, 0, 1)	-2.6	-1.95	-1.61	1.719	Non-stationary
dRE	(C, T, 1)	-4.04	-3.45	-3.15	-5.1463	Stationary
GDP	(0, 0, 1)	-2.6	-1.95	-1.61	3.1133	Non-stationary
dGDP	(C, T, 2)	-4.04	-3.45	-3.15	-4.7768	Stationary
CPI	(0, 0, 2)	-3.51	-2.89	-2.58	-1.6492	Non-stationary
dCPI	(C, T, 1)	-4.04	-3.45	-3.15	-6.2754	Stationary
M2	(C, 0, 5)	-3.51	-2.89	-2.58	-2.6807	Non-stationary
dM2	(C, T, 4)	-4.04	-3.45	-3.15	-6.2642	Stationary

Note: The test form is denoted as (C, T, p), where C represents the intercept term, T represents the trend term, and p represents the lag order.

3.2.2. Stationarity test based on the 2016-2024 subsample

The following table presents the results of the unit root test for the 2016-2024 subsample. It can be observed that at the significance levels of 1%, 5%, and 10%, all variables in the sample without differencing are non-stationary sequences.

After first-order difference, all variables are stationary sequences at the significance levels of 1%, 5%, and 10%. Therefore, it is considered that at the 1% significance level, all variables in the 2016-2024 subsample are first-order integrated, and a cointegration relationship test is needed. If a cointegration relationship exists, a VECM can be established. If no cointegration relationship exists, the variables should be differenced before establishing the VAR model.

Table 6. Results of unit root test for the 2016-2024 subsample

Variable	Test form	1% critical value	5% critical value	10% critical value	ADF test value	Stationarity status
SHIBOR	(0, 0, 1)	-2.58	-1.95	-1.62	-0.8291	Non-stationary
dSHIBOR	(C, T, 1)	-3.99	-3.43	-3.13	-9.0363	Stationary
SSEC	(0, 0, 1)	-2.58	-1.95	-1.62	0.1041	Non-stationary
dSSEC	(C, T, 1)	-3.99	-3.43	-3.13	-7.3742	Stationary
HP	(0, 0, 4)	-2.58	-1.95	-1.62	-0.2203	Non-stationary
dHP	(C, T, 1)	-3.99	-3.43	-3.13	-4.2232	Stationary
RE	(0, 0, 1)	-2.58	-1.95	-1.62	-1.0386	Non-stationary
dRE	(C, T, 1)	-3.99	-3.43	-3.13	-6.3459	Stationary
GDP	(0, 0, 4)	-2.58	-1.95	-1.62	2.8142	Non-stationary
dGDP	(C, 0, 3)	-3.46	-2.88	-2.57	-3.924	Stationary
CPI	(0, 0, 2)	-2.58	-1.95	-1.62	2.4862	Non-stationary
dCPI	(C, T, 1)	-3.99	-3.43	-3.13	-7.8471	Stationary
M2	(C, 0, 5)	-3.46	-2.88	-2.57	-0.1688	Non-stationary
dM2	(C, T, 4)	-3.99	-3.43	-3.13	-6.0519	Stationary

3.3. Cointegration Test

Cointegration represents a long-term stable linear relationship among non-stationary time series. When significant cointegration exists among non-stationary variables, a VECM can be constructed to reduce the information loss associated with using a VAR model after differencing. Based on the previous unit root tests conducted on the two subsamples, it is known that the variables cannot be directly used to construct a VAR model, and thus a cointegration test is required first. There are two main methods for cointegration test: the Engle-Granger (E-G) two-step method and the Johansen cointegration test. The E-G two-step method is based on the least squares estimation of the residual series and requires only two variables. The Johansen cointegration test, based on canonical correlation analysis, has no strict requirements on the order of integration of the variables. Given the large number of variables in this paper, the Johansen cointegration test is selected to examine the cointegration relationship among the variables in the two samples. The test is conducted by using the maximum eigenvalue test form.

When conducting the Johansen cointegration test, the first step is to determine the lag order using the VAR model and information criteria. Given that the two subsamples in this paper have sizes of 84 and 105, respectively, with 7 variables, the selection range for the lag order is 1-3. The information criteria are shown in the table below. For the 2009-2015 subsample, the AIC, HQ, SC, and FEQ all indicate that the minimum value occurs at a lag of 2, so a lag of 2 is selected. In the 2016-2024 subsample, according to AIC, HQ, and FEQ, a lag of 2 is considered optimal, while SC suggests a lag of 1 as optimal. Following the principle of majority rule, a lag of 2 is selected. Note that the lag order for the Johansen test is one less than that for the VAR model. However, if the lag order is too small, the model may not fully capture the dynamic characteristics of the data. Therefore, it may be necessary to increase the lag order, taking into account economic theory as well. The transmission effect of monetary policy may take a relatively long time to manifest, so consideration can be given to appropriately increasing the lag order. After comprehensive consideration, the lag orders for the Johansen test in the two subsamples are selected as 2 and 3, respectively.

Table 7. Selection of optimal lag order for the 2009-2015 subsample

Lag order	AIC	HQ	SC	FEQ
1	-1.157332e+01	-1.090914e+01	-9.917900e+00	9.456589e-06
2	-1.396323e+01*	-1.271790e+01*	-1.085931e+01*	8.891800e-07*
3	-1.369679e+01	-1.187030e+01	-9.144376e+00	1.241844e-06

Table 8. Selection of optimal lag order for the 2016-2024 subsample

Lag order	AIC	HQ	SC	FEQ
1	-1.498682e+01	-1.440324e+01	-1.354566e+01*	3.106627e-07
2	-1.617505e+01*	-1.508085e+01*	-1.347287e+01	9.589496e-08*
3	-1.600263e+01	-1.439780e+01	-1.203944e+01	1.177793e-07

The Johansen test was conducted on the two subsamples, and the test results are shown in the table below. The results indicate that for the 2009-2015 subsample, at the 1% significance level, there are two cointegration relationships in the original series; at the 5% significance level, there are three cointegration relationships; and at the 10% significance level, there are four cointegration relationships. For the 2016-2024 sample, at the 1% significance level, there is one cointegration relationship in the original series; at the 5%

significance level, there are two cointegration relationships; and at the 10% significance level, there are three cointegration relationships. These results suggest the existence of long-term equilibrium relationships among various macroeconomic variables, quantity-based policy variables, and price-based policy variables. Due to the presence of cointegration relationships, a VECM can be established for analysis.

Table 9. Results of cointegration tests for the 2009-2015 subsample (Since the inclusion of a trend term in the cointegration space yielded non-significant test results, the cointegration space is specified with a constant term for the analysis)

Null hypothesis	Statistic	10% critical value	5% critical value	1% critical value
$r \leq 6$	5.09	7.52	9.24	12.97
$r \leq 5$	8.18	13.75	15.67	20.20
$r \leq 4$	17.79	19.77	22.00	26.81
$r \leq 3$	25.84	25.56	28.14	33.24
$r \leq 2$	36.64	31.66	34.40	39.79
$r \leq 1$	53.29	37.45	40.30	46.82
$r = 0$	70.34	43.25	46.45	51.91

Table 10. Results of cointegration tests for the 2016-2024 subsample

Null hypothesis	Statistic	10% critical value	5% critical value	1% critical value
$r \leq 6$	7.22	7.52	9.24	12.97
$r \leq 5$	14.20	13.75	15.67	20.20
$r \leq 4$	17.91	19.77	22.00	26.81
$r \leq 3$	21.88	25.56	28.14	33.24
$r \leq 2$	32.64	31.66	34.40	39.79
$r \leq 1$	41.69	37.45	40.30	46.82
$r = 0$	65.52	43.25	46.45	51.91

3.4. Residual Independence Test

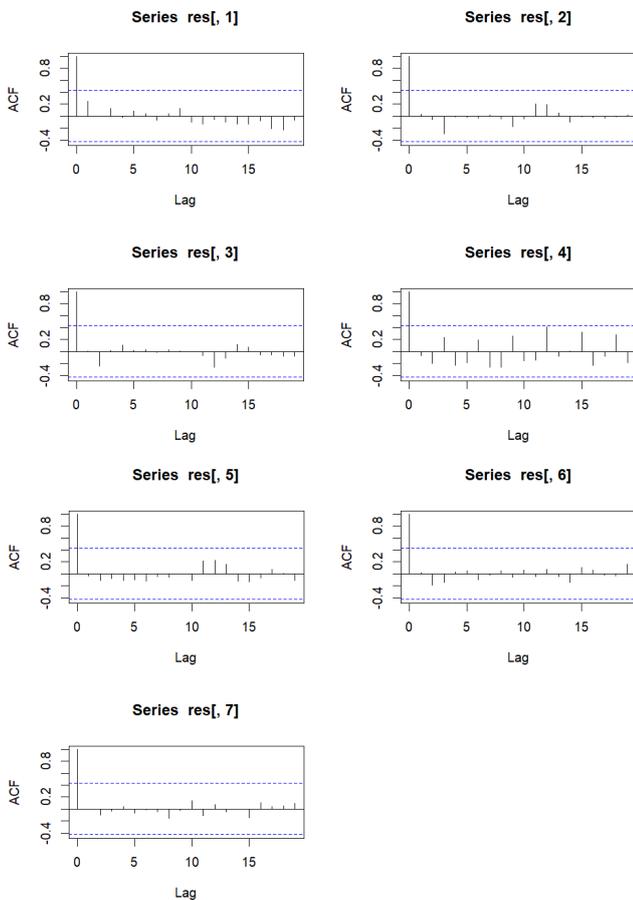


Figure 2. Results of residual independence test for the 2009-2015 subsample

Residual independence refers to the condition that the residual sequence of a model should be white noise, meaning that there is no significant autocorrelation among the residuals. Ideally, the model should have fully captured the dynamic characteristics among the variables, and the residuals should behave as a random time series without predictability. If the residuals exhibit significant autocorrelation, it suggests that the model may have omitted some important dynamic relationships and further adjustments to the model are needed. The following figure presents the autocorrelation plot of the residuals, based on which we can conclude that the residuals in both sample intervals are independent.

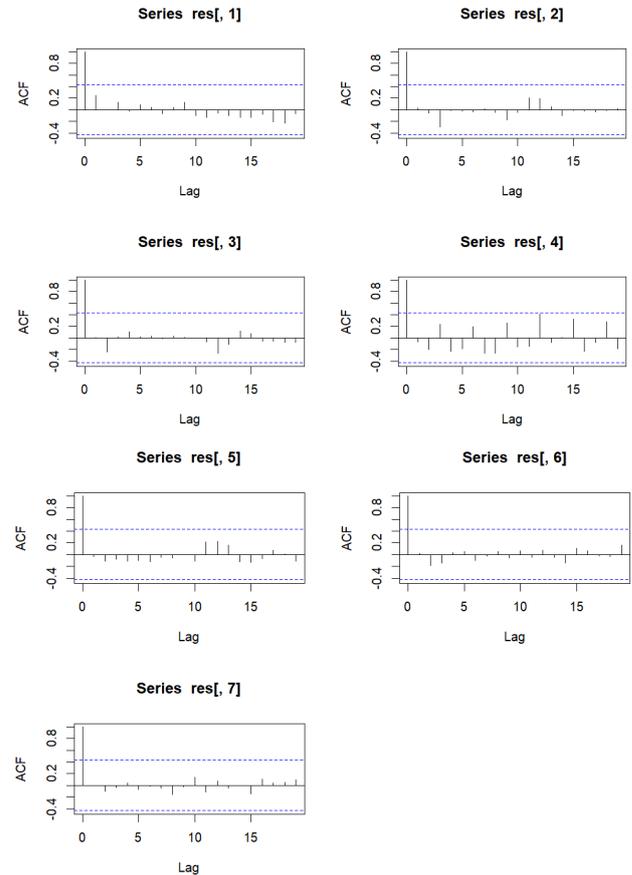


Figure 3. Results of residual independence test for the 2016-2024 subsample

3.5. Stationarity Test of Cointegration Terms

The stationarity test of the cointegration terms in the Vector Error Correction Model (VECM) is a crucial step in determining whether the cointegration relationship holds. The stationarity of the cointegration terms is one of the core assumptions in constructing the VECM. If the cointegration terms are stationary, it indicates the existence of a long-term equilibrium relationship among the variables in the model, and the dynamic adjustment process is reasonable and effective. The following table presents the ADF test results for the cointegration terms. Due to the independence of the residuals, the maximum lag order for the test is reduced to 3. It can be seen that at the 5% significance level, the cointegration terms for both samples are considered stationary.

Table 11. Stationarity test results for cointegration terms of the 2009-2015 subsample

Variable	Test form	1% critical value	5% critical value	10% critical value	ADF test value	Stationarity status
Cointegration terms	(C, T, 3)	-4.04	-3.45	-3.15	-4.6389	Stationary

Table 12. Stationarity test results for cointegration terms of the 2016-2024 subsample

Variable	Test form	1% critical value	5% critical value	10% critical value	ADF test value	Stationarity status
Cointegration terms	(C, T, 3)	-3.99	-3.43	-3.13	-3.8557	Stationary

3.6. Establishment of the Vector Error Correction Model (VECM)

The VECM is established based on the cointegration relationship that passes the relevant tests.

For the 2009-2015 sample, through the aforementioned tests, it was found that there exists one cointegration relationship. Based on this cointegration relationship, the VECM is established, and the estimated cointegration relationship in the final model is shown in the following equation:

$$HP = -29.55GDP + 6.985SHIBOR + 204.1255M2 - 6.549CPI - 0.004SSEC - 0.1725RE - 1601$$

The coefficient of SHIBOR is 6.985, indicating that the SHIBOR interest rate has a significant positive effect on housing prices. This differs from economic theory, possibly due to the increase in loan demand during upward trends in housing prices pushing up market interest rates, which to some extent reflects the linkage between SHIBOR and housing prices, but not necessarily a causal relationship. Alternatively, it may be due to a certain lag in policy transmission. Although theoretically, rising interest rates increase the borrowing costs for homebuyers, thereby inhibiting housing prices, due to the lagged effect of policies, the market may exhibit opposite changes in the short term. The coefficient of M2 is 204.1255, suggesting a strong positive effect of money supply on housing prices. This aligns with economic theory, where loose monetary policy increases liquidity in the market and lowers the cost of capital, thereby stimulating demand for real estate. With adequate money supply, more funds will flow into the real estate market, driving up market prices. The negative impact of GDP on housing prices may indicate a divergence between the real estate market and economic fundamentals, necessitating further guidance for the healthy development of the real estate industry to shift it away from speculation towards substantial contributions to the economy.

For the 2016-2024 sample, through the aforementioned tests, it was found that there exists one cointegration relationship. Based on this cointegration relationship, the VECM is established, and the estimated cointegration relationship in the final model is shown in the following equation:

$$GDP = 0.01158HP + 0.068SHIBOR + 1.157M2 - 0.0544CPI - 0.000096SSEC + 0.00015RE + 0.74$$

The impact of M2 on GDP is significantly positive, indicating that the growth of money supply is an important factor driving economic growth. This aligns with economic theory, as increased monetary liquidity promotes credit

expansion, providing more financial support for businesses and consumers, thereby stimulating investment and consumption growth. Loose monetary policy is often associated with economic stimulus, and an increase in money supply is a crucial means of driving economic growth. The relatively high coefficient of M2 (1.157) suggests that monetary policy has a strong influence on economic growth. The impact of SHIBOR on GDP is positive, indicating that rising interest rates have a certain driving effect on GDP. This may be because SHIBOR typically rises during economic upturns, reflecting an increased demand for funds in the market. Therefore, there is a positive correlation between rising interest rates and GDP growth.

3.7. Impulse Response Function

The Impulse Response Function (IRF) can reveal, within a VAR model or VECM, the dynamic impact pathway of a variable on other variables in the system when it receives an exogenous shock. To understand the differences in the impact pathways and effects of price-based (SHIBOR) and quantity-based (M2) monetary policy tools on other macroeconomic variables, this paper will incorporate the analysis results of the IRF.

3.7.1. Impulse Response Function before interest rate liberalization

Firstly, we analyze the transmission of interest rates to other macroeconomic variables before interest rate liberalization. In the short term, when a shock of one standard deviation unit is applied to the price-based monetary policy instrument (SHIBOR), the impulse response results for various variables are shown in Figure 4.

This paper analyzes the effectiveness of price-based monetary policy in regulating macroeconomic variables from six aspects: exchange rate, output, inflation, money supply, stock prices, and housing prices. The results show that, except for the exchange rate, the impact of interest rates on other macroeconomic variables aligns with economic theory. However, except for money supply (M2) and output (GDP), the regulatory effect on the remaining variables is not significant, and there is a certain lag in the adjustment of inflation (CPI).

(1) Response of exchange rates

An increase in interest rates typically leads to a depreciation of the exchange rate (An increase in interest rates typically leads to a depreciation of the exchange rate). According to interest rate parity theory, higher interest rates attract international capital inflows, thereby depreciating the domestic currency. Additionally, higher interest rates usually curb inflation, which enhances the real purchasing power of the domestic currency, leading to a depreciation in real exchange rate terms. It can be observed that before interest rate liberalization, when the interest rate (SHIBOR) received a positive shock of one standard deviation, the real exchange

rate (RE) received a positive shock as well, which gradually increased in the short term before stabilizing. This deviates from theoretical expectations, indicating that China's price-based monetary policy was ineffective in regulating the exchange rate before interest rate liberalization.

(2) Response of output

An increase in interest rates reduces output mainly through three channels: investment, consumption, and net exports. Firstly, higher interest rates imply higher financing costs for businesses, thereby reducing investment demand and negatively impacting output. Secondly, higher interest rates increase the cost of intertemporal consumption for consumers, reducing preemptive consumption and inhibiting output. Lastly, higher interest rates lead to appreciation of the domestic currency, reducing the competitiveness of domestic products, decreasing net exports, and weakening the driving effect of net exports on output. It can be seen that when SHIBOR receives a positive shock of one standard deviation, output decreases, which aligns with the negative correlation between interest rates and output.

(3) Response of inflation

Inflation tends to decline when interest rates rise. Inflation essentially represents excess currency issuance. When interest rates increase, savers earn higher interest income, prompting more currency to be deposited in savings institutions. While borrowers face higher financing costs, leading to reduced investment and consumption demand. The decrease in currency circulation and aggregate demand in the market has an inhibitory effect on inflation. It can be observed that before interest rate liberalization, when the interest rate (SHIBOR) received a positive shock, inflation (CPI) initially received a positive shock but gradually declined over subsequent periods, turning into a negative impact after 15 periods. This indicates that there is a certain lag in the transmission of interest rates to inflation, suggesting the need to enhance the deposit-attracting capacity of savings institutions.

(4) Response of money supply

An increase in interest rates typically leads to a reduction in money supply, mainly through the following channels: decreased demand for bank loans, increased financing costs, lowered credit supply, reduced investment and consumption demand, and possibly through tightening policies by the central bank. It can be seen that when SHIBOR receives a positive shock of one unit, the money supply M2 experiences

a significant negative shock, and this impact gradually increases over time until it stabilizes. This aligns with the negative correlation between interest rates and money supply, indicating that the transmission channel from interest rates to money supply is generally effective.

(5) Response of stock prices

An increase in interest rates leads to a decline in stock prices. This is because rising interest rates elevate the discount rate applied to future corporate cash flows, resulting in lower corporate valuations and consequently lower stock prices. Higher interest rates also enhance the attractiveness of fixed-income assets, diverting investments away from the stock market and further suppressing stock prices. As evident in the figure, when interest rates (SHIBOR) receive a positive shock, stock prices experience a negative impact in the short term, which gradually diminishes over time. This is consistent with the negative correlation between interest rates and stock prices, indicating that interest rate adjustments are generally effective in influencing the stock market.

(6) Response of housing prices

An increase in interest rates causes a decline in housing prices. This occurs because rising interest rates directly increase the mortgage loan costs for homebuyers, reducing the demand for housing. Additionally, higher interest rates make fixed-income assets more attractive, diverting investments away from the real estate market and leading to a decrease in housing prices. As shown in the figure, when interest rates (SHIBOR) receive a positive shock of one unit, housing prices experience a negative impact that gradually intensifies over time. This aligns with the negative relationship between interest rates and housing prices, suggesting that interest rate adjustments are effectively regulating housing prices.

Subsequently, we analyze the transmission of money supply to other macroeconomic variables prior to interest rate liberalization. In the short term, when a positive shock is given to M2, the impulse response results for various variables are shown in Figure 5. It can be observed that the adjustment mechanisms of money supply for various macroeconomic variables are consistent with economic theory. However, except for inflation (CPI), the impacts on the remaining variables are insignificant. This indicates that although the regulation mechanism of money supply is effective, its transmission channels still have deficiencies and require further enhancement.

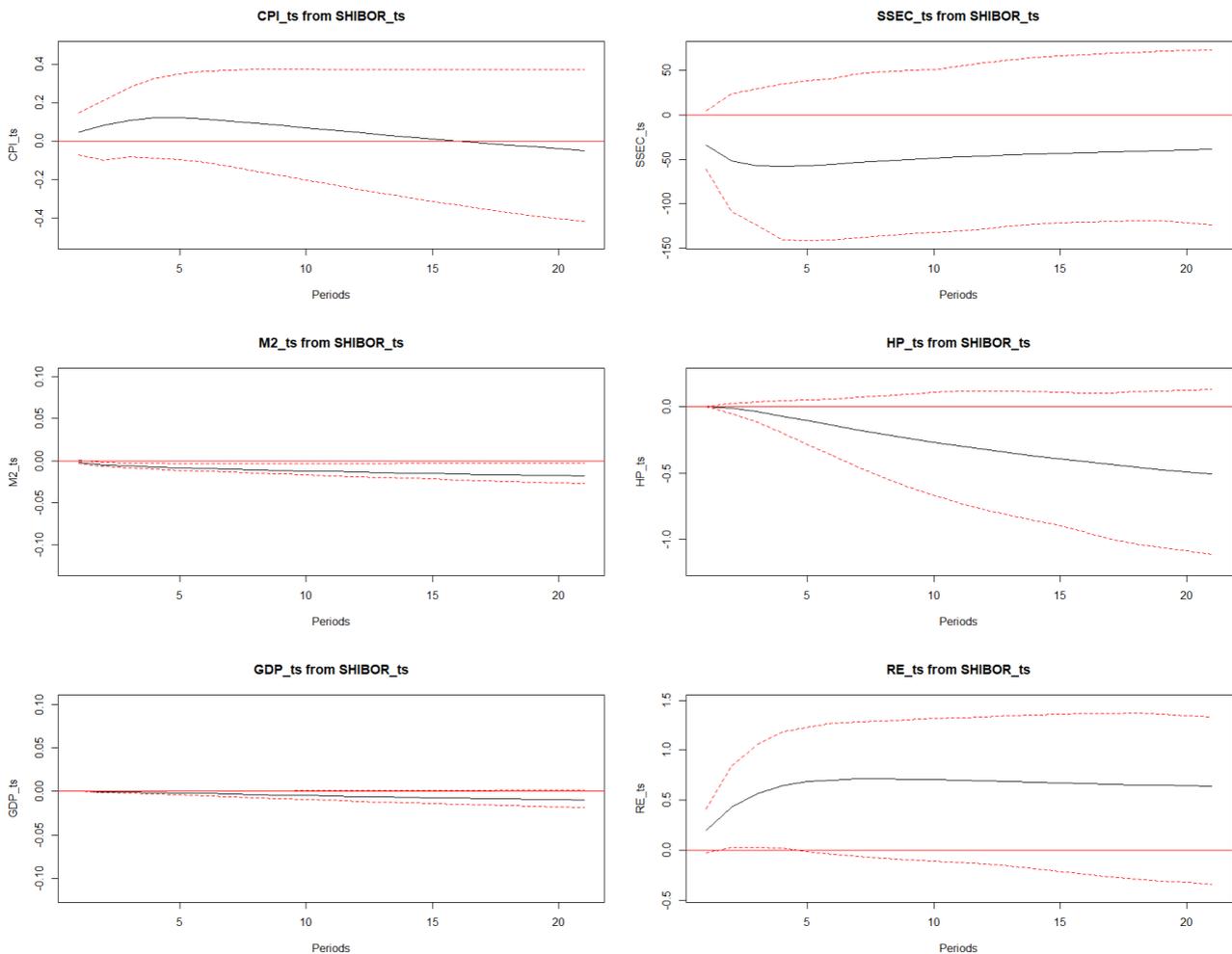


Figure 4. Impulse response of SHIBOR to macroeconomic variable shocks before interest rate liberalization

(7) Response of exchange rates

An increase in the money supply (M2) typically leads to an increase in the exchange rate. When the money supply expands, the circulation of currency in the market increases, resulting in a relative increase in the supply of domestic currency compared to foreign currencies, which leads to depreciation of the domestic currency. Concurrently, an elevated money supply may heighten inflation expectations, weakening the purchasing power of the domestic currency and further driving up the exchange rate. As shown in the figure, when the money supply receives a positive shock, the real exchange rate (RE) experiences a slight positive impact, which is consistent with the theory of a positive correlation between the money supply and the real exchange rate in terms of its adjustment mechanism. This suggests that the transmission mechanism of money supply changes to exchange rates is effective.

(8) Response of output

An increase in the money supply typically boosts output by lowering financing costs and stimulating aggregate demand. Firstly, an expansion in the money supply implies enhanced liquidity in the market, leading to an expansion in bank credit supply, reduced financing costs for enterprises, and increased investment demand, thereby boosting investment demand and positively affecting output. Secondly, an increase in the money supply stimulates consumer demand as consumers have more disposable funds, driving further growth in output. Lastly, an increase in the money supply may lead to depreciation of the domestic currency, enhancing the competitiveness of domestic products in the international

market, increasing net exports, and thus driving up output. As illustrated in the figure, when the money supply (M2) receives a positive shock of one unit, output (GDP) experiences a positive impact and gradually stabilizes thereafter, which aligns with the theory of a positive correlation between the money supply and economic output.

(9) Response of inflation

An increase in the money supply typically leads to a rise in prices. According to the quantity theory of money, if the increase in the money supply exceeds the growth in actual economic output, it will result in an elevation of the price level. An expansion in the money supply signifies enhanced liquidity in the market, which boosts consumers' spending power. The increase in demand may surpass the growth in supply, leading to a rise in inflation. As shown in the figure, when the money supply (M2) receives a positive shock of one unit, prices (CPI) experience a positive impact in the short term. Over time, the inflation rate gradually rises and then stabilizes. This indicates that the transmission of money supply to inflation is effective.

(10) Response of interest rates

An increase in the money supply typically leads to a decline in interest rates. An expansion in the money supply signifies ample liquidity in the market, which augments the funding sources of commercial banks and expands the supply of loans, thereby pushing down market interest rates. As shown in the figure, when the money supply (M2) receives a positive shock of one unit, interest rates (represented by SHIBOR) experience a negative impact and gradually stabilize over time. This aligns with the negative correlation between the

money supply and interest rates.

(11) Response of stock prices

An increase in the money supply typically leads to a rise in stock prices. Firstly, an expansion in the money supply signifies enhanced market liquidity, enabling investors to finance at lower costs, which contributes to pushing up asset prices. Secondly, an increase in the money supply leads to a decline in interest rates, reducing the attractiveness of fixed-income assets and drawing more funds into the stock market, further boosting stock prices. Additionally, an increase in the money supply may stimulate an improvement in corporate profitability, thereby enhancing the valuation of stocks. As shown in the figure, when the money supply (M2) receives a positive shock of one unit, stock prices (represented by the SSECS index) experience a positive impact, with the effect rising initially and then stabilizing over time. This aligns with the positive correlation between the money supply and stock prices, indicating that monetary policy is relatively effective

in transmitting to capital markets.

(12) Response of housing prices

An increase in the money supply typically leads to a rise in housing prices. Firstly, an expansion in the money supply reduces the interest rates on home mortgages, lowering the mortgage costs for homebuyers and subsequently increasing the demand for housing. Secondly, an increase in the money supply boosts market liquidity, directing more funds towards the real estate market and pushing up housing prices. Additionally, heightened inflation expectations may prompt investors to allocate more funds towards real estate as a hedge against inflation risk. As illustrated in the figure, when the money supply (M2) receives a positive shock of one unit, housing prices (HP) experience a positive impact, which gradually intensifies over time. This aligns with the positive correlation between the money supply and housing prices, indicating that the mechanism through which changes in the money supply affect the real estate market is effective.

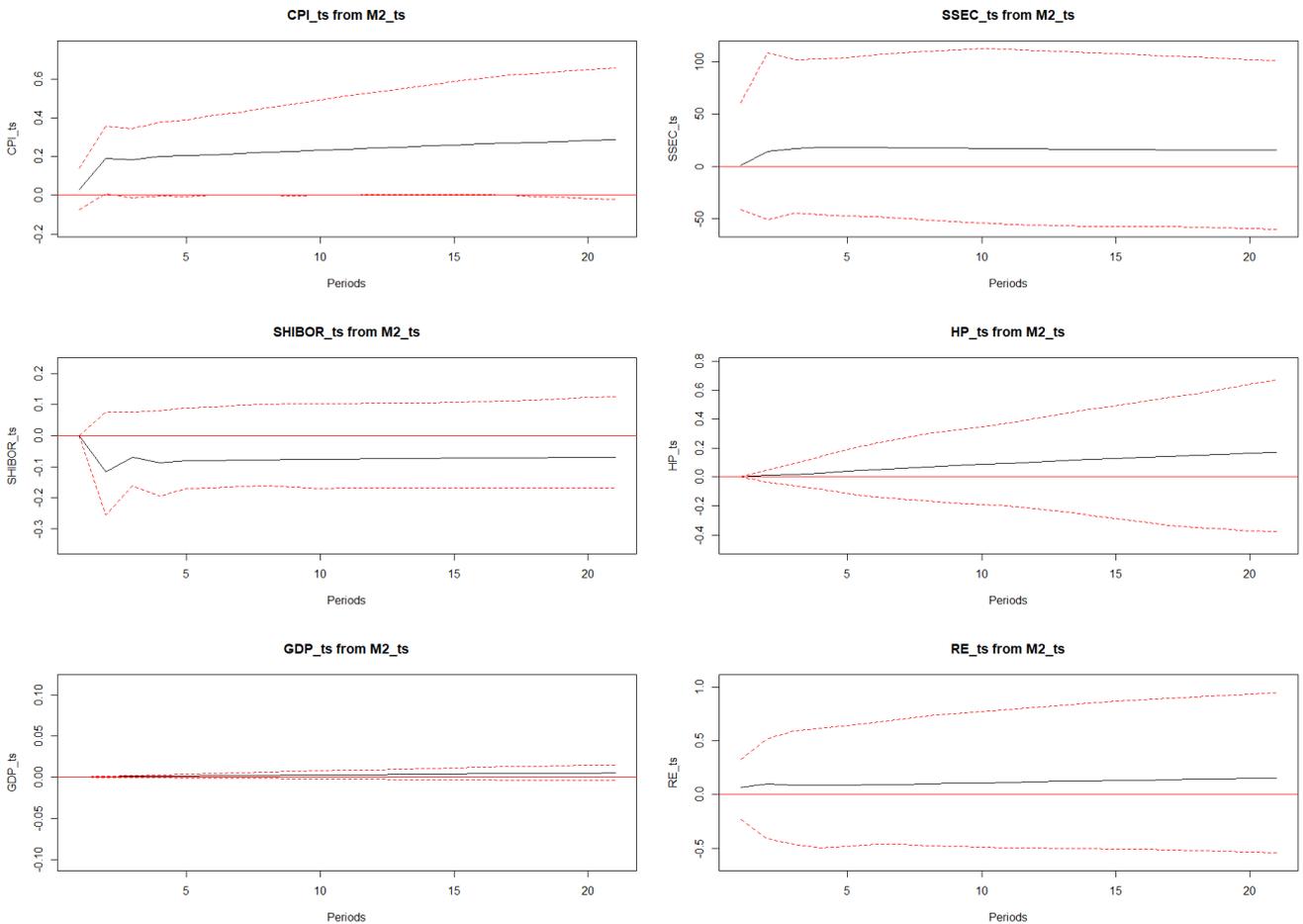


Figure 5. Impulse response of M2 to macroeconomic variable shocks before interest rate liberalization

3.7.2. Impulse Response Function after interest rate liberalization

Next, we analyze the transmission of interest rates to other macroeconomic variables after interest rate liberalization. In the short term, when SHIBOR receives a shock of one standard deviation unit, the impulse response results for each variable are shown in Figure 6.

It can be observed that the impact of interest rates on all macroeconomic variables aligns with economic theory. Compared to the period before interest rate liberalization, the

adjustment to inflation (CPI) no longer exhibits lagged effects, and the transmission to exchange rates (RE) has also been strengthened. However, the impact on output (GDP) and housing prices (HP) has weakened. This suggests that, after interest rate liberalization, the transmission channels of China’s price-based monetary policy towards ultimate goals have improved to some extent, but there are still deficiencies. Simultaneously, the regulatory role of interest rates (SHIBOR) on money supply (M2) has weakened, reflecting an enhanced exogenous nature of money supply.

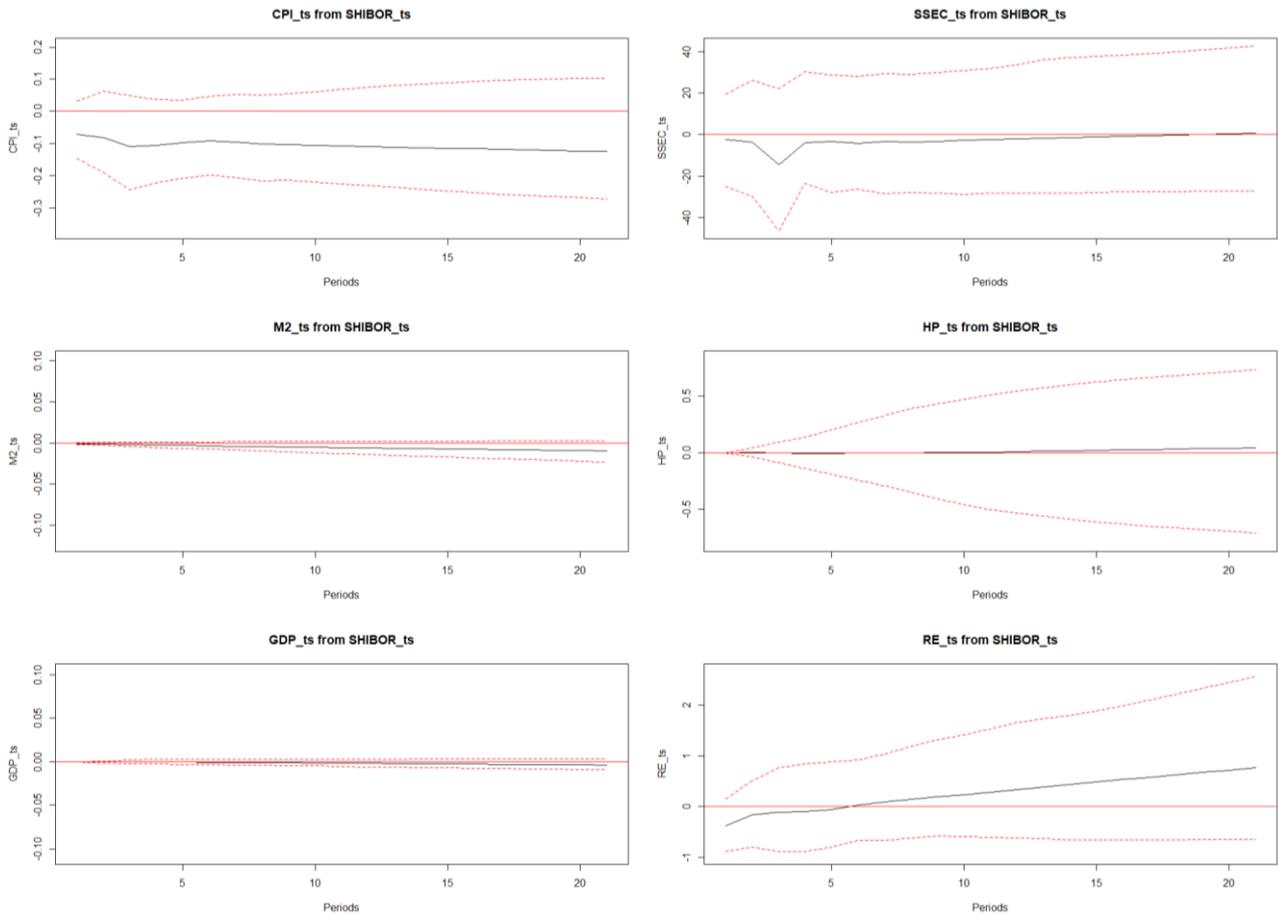


Figure 6. Impulse response of interest rates to macroeconomic variable shocks after interest rate liberalization

Finally, we analyze the transmission of money supply to other macroeconomic variables after interest rate liberalization. In the short term, when M2 receives a positive shock, the impulse response results for each variable are shown in Figure 7.

It can be observed that the adjustment mechanisms of money supply on various macroeconomic variables align with economic theory, and its impact on variables such as inflation

(CPI) and stock prices (SSEC) is more pronounced. This suggests that the transmission channels of China's quantity-based monetary policy towards ultimate goals have also improved to some extent after interest rate liberalization. Notably, the regulatory role of money supply (M2) on interest rates (SHIBOR) has weakened, reflecting a further enhancement of the exogenous nature of interest rates.

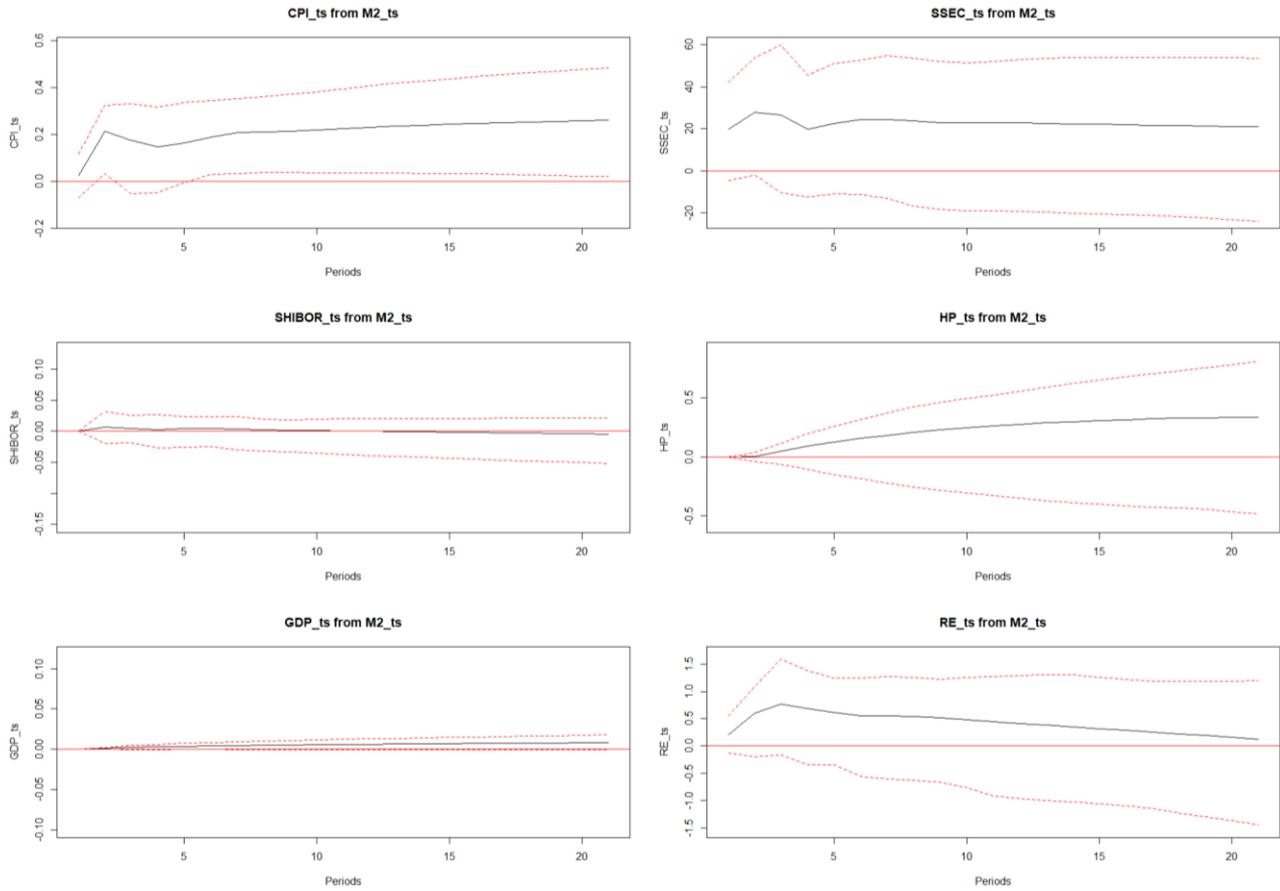


Figure 7. Impulse response of M2 to macroeconomic variable shocks after interest rate liberalization

3.8. Analysis of Variance Decomposition

Impulse response can demonstrate both price-based and quantity-based regulatory mechanisms. However, to further analyze which mechanism is superior, variance decomposition is necessary. Variance decomposition is used to quantify the sources of fluctuation for a variable within a system. By decomposing the prediction error variance of a variable into the contribution proportions of various shock sources, it assesses the relative importance of different shocks to that variable. This reflects the proportion caused by shocks from other variables within the system. In this paper, variance decomposition is employed to measure the contribution of quantity-based money (M2) and price-based money

(SHIBOR) to inflation (CPI) and output (GDP) before and after interest rate liberalization, respectively.

3.8.1. Variance decomposition before interest rate liberalization

The variance decomposition of CPI before interest rate liberalization is shown in the following table. It can be observed that the explanatory power of quantity-based money (M2) on inflation (CPI) remains stable at 7%, while that of price-based money (SHIBOR) is stable at 2%. Quantity-based money is superior to price-based money in regulating prices. Moreover, quantity-based money's regulatory effect can reach 6% in the second period, indicating a relatively fast speed of regulation.

Table 13. Variance decomposition of CPI from 2009 to 2015

Periods	CPI	M2	GDP	RE	SSEC	HP	SHIBOR
1	93.65705	0.3894936	0.8441991	0.0000000	0.0000000	0.8441991	0.9042450
2	87.37644	6.1324488	0.4422549	0.2952114	0.07730039	0.4422549	1.4559048
3	84.35852	6.8420646	1.0514188	1.1099123	0.14353650	1.0514188	1.9878958
4	81.46522	7.2536068	2.1534074	1.7964112	0.20442638	2.1534074	2.3147088
5	79.06802	7.3552575	3.4209359	2.3413213	0.23574179	3.4209359	2.4221054
6	77.01493	7.3651574	4.7125472	2.7594393	0.23799352	4.7125472	2.3810551
7	75.23978	7.3185675	5.9576758	3.0919035	0.22077300	5.9576758	2.2503353
8	73.66835	7.2439367	7.1306736	3.3650992	0.19435662	7.1306736	2.0743403
9	72.25050	7.1525571	8.2245350	3.5966875	0.16644240	8.2245350	1.8815306
10	70.95056	7.0518189	9.2409176	3.7974616	0.14183584	9.2409176	1.6891916

The variance decomposition of GDP before interest rate liberalization is shown in the table below. It can be observed that the explanatory power of quantity-based money (M2) on output (CPI) is less than 1% in the first eight periods, while

that of price-based money (SHIBOR) exceeds 1% in the sixth period and later reaches 2%. Price-based money is superior to quantity-based money in regulating output. However, the effect of price-based money regulation takes longer to

materialize. In the short term, quantity-based monetary policy has a better regulatory effect than price-based monetary policy.

Table 14. Variance decomposition of GDP from 2009 to 2015

Periods	GDP	M2	CPI	RE	SSEC	HP	SHIBOR
1	99.64651	0.0000000	0.0000000	0.0000000	0.0000000	0.3534875	0.0000000
2	97.69988	0.2150085	0.9600176	0.08533192	0.006518493	1.0076909	0.02555281
3	94.69702	0.3842002	2.5962195	0.32318729	0.003.770428	1.7565042	0.23909977
4	91.32204	0.5449915	4.3499335	0.64540695	0.03444870	2.5255054	0.57767288
5	87.93842	0.6772193	6.0254976	1.00096826	0.1105566	3.2695764	0.97776598
6	84.73719	0.7877444	7.5427523	1.35415913	0.2222469	3.9666466	1.38926197
7	81.79871	0.8794135	8.8834565	1.68720226	0.3557603	4.6097037	1.78575815
8	79.14265	0.9559410	10.0550439	1.99237461	0.5000050	5.1992156	2.15476598
9	76.75814	1.0202104	11.0752208	2.26785169	0.6474560	5.7390313	2.49209225
10	74.62133	1.0746100	11.9640557	2.51470254	0.7934524	6.2341102	2.79774411

3.8.2. Variance decomposition after interest rate liberalization

The variance decomposition of CPI after interest rate liberalization is shown in the table below. It can be observed that the explanatory power of quantity-based money (M2) on inflation (CPI) stabilizes at 10%, and it is greater than that before interest rate liberalization from the second period onwards. Meanwhile, the explanatory power of price-based money (SHIBOR) stabilizes at 3%, showing a strong effect

from the first period. Its regulatory effect on inflation is also better after interest rate liberalization compared to before.

Comparing the regulatory effects of price-based and quantity-based monetary policies on inflation (CPI) before and after interest rate liberalization, it is evident that both have been enhanced. This indicates that interest rate liberalization has improved the regulatory effectiveness of China's monetary policy. Quantity-based monetary policy is superior to price-based monetary policy in both periods, proving more effective in stabilizing prices.

Table 15. Variance decomposition of CPI from 2016 to 2024

Periods	CPI	M2	GDP	RE	SSEC	HP	SHIBOR
1	94.63542	0.3442595	00.7095754	0.000000	0.000000	1.4883423	2.822402
2	83.89894	8.8477976	0.3507844	3.724955	0.112487	0.8166929	2.248348
3	80.30116	9.2650220	0.7798407	4.112178	1.562526	1.1560132	2.823266
4	79.05999	9.1864019	2.2617938	3.418013	1.750661	1.1062200	3.216921
5	77.13416	9.5467263	4.4819952	2.852474	1.693854	0.9268341	3.363957
6	75.05698	10.2494068	6.4204189	2.540286	1.632713	0.7766747	3.323519
7	73.00002	10.9908920	7.9074912	2.496633	1.589955	0.7126711	3.302335
8	71.12450	11.5161750	9.1659364	2.573928	1.545919	0.7595211	3.314022
9	69.41176	11.8876946	10.3118798	2.648441	1.487238	0.9258074	3.327181
10	67.76952	12.1951901	11.3636225	2.724655	1.420439	1.1928689	3.333706

The variance decomposition of GDP after interest rate liberalization is shown in the table below. It can be observed that the explanatory power of quantity-based money (M2) on output (GDP) stabilizes at 3.5%, representing a significant increase compared to the pre-liberalization period. However, the regulatory effect of price-based money (SHIBOR) on GDP declines substantially, falling to less than 0.2% in the tenth period. Upon reviewing relevant literature, it is found that during this stage, the interbank bond repo rate quickly stepped in as the primary price-based monetary policy tool for regulating output. After incorporating the interbank bond repo rate (REPO) into the model, it is revealed that the contribution of REPO and SHIBOR to GDP during this period is greater

than that of M2.

Comparing the periods before and after interest rate liberalization, it is found that the regulatory effect of M2, representing quantity-based monetary policy, has strengthened, while that of SHIBOR has declined sharply. This indicates that interest rate liberalization has enhanced the regulatory effectiveness of quantity-based monetary policy. Meanwhile, using SHIBOR as an intermediate target for price-based monetary policy to regulate GDP yields poor results at this time. Instead, other interest rates such as the interbank bond repo rate can be selected as intermediate targets.

Table 16. Variance decomposition of GDP from 2016 to 2024

Periods	GDP	M2	CPI	RE	SSEC	HP	SHIBOR
1	100.00000	0.0000000	0.0000000	0.0000000	0.00000000	0.0000000	0.000000
2	98.03054	0.6400346	0.9922194	0.003.507504	0.08415927	0.2146688	0.03487057
3	96.34627	1.6430449	1.3526896	0.009982302	0.09082145	0.5406769	0.01651880
4	95.15499	2.4111940	1.2578093	0.1206499	0.09032971	0.9551892	0.009836523
5	93.96599	3.0480476	1.0407387	0.3477167	0.07704469	1.5067744	0.01369061
6	92.83992	3.4876016	0.8354087	0.6008524	0.06210038	2.1464644	0.02765293
7	91.74708	3.8180775	0.6675339	0.8293807	0.05035331	2.8349720	0.05260284
8	90.69197	4.0928258	0.5361101	1.040979	0.04111359	3.5119432	0.08506154
9	89.68469	4.3392402	0.4392629	1.242050	0.03378623	4.1387623	0.1222066
10	88.74333	4.5621276	0.3743602	1.432836	0.02827251	4.6953289	0.1637408

4. Research Conclusions and Policy Recommendations

This paper employs monthly data from January 2009 to October 2024, dividing the sample into two periods: January 2009 to December 2015 and January 2016 to October 2024. Using VAR and VECM models, unit root tests, cointegration tests, residual independence tests, cointegration term stationarity tests, impulse response analysis, and variance decomposition were conducted to analyze the effectiveness of quantity-based and price-based monetary policies in China. The research conclusions and recommendations are listed as follows:

4.1. Policy Effectiveness Varies Under Different Policy Objectives

In China, the primary objectives of monetary regulation are price stability and economic growth. Quantity-based monetary policy is most effective in stabilizing prices. This is primarily because quantity-based monetary policy directly impacts the money supply, influencing market supply and demand relationships and thereby exerting a direct and significant impact on price levels. In terms of economic growth, price-based monetary policy is more effective, but this depends on selecting reasonable intermediate targets. Price-based monetary policy guides the investment and consumption decisions of market entities by influencing price signals such as interest rates, thereby promoting economic growth. However, if inappropriate intermediate targets are selected, its regulatory effect on economic growth will be poor.

4.2. Impact of Interest Rate Liberalization on Monetary Policy Effectiveness

As the process of interest rate liberalization advances, the effectiveness of monetary policy continues to strengthen. Interest rate liberalization enables interest rates to more accurately reflect market supply and demand for funds, enhancing the effectiveness of interest rates as price signals and subsequently boosting the transmission efficiency of monetary policy. In this process, the exogenous nature of interest rates and money supply increases, meaning that they are less susceptible to external factors, and the central bank's ability to regulate them is enhanced. However, the effectiveness of monetary policy in regulating other macroeconomic variables such as the stock market and housing prices still needs to be strengthened, and there are certain limitations in achieving multi-objective regulation.

4.3. Changes in Monetary Policy Transmission Mechanisms

During the process of interest rate liberalization, significant changes have occurred in the transmission mechanisms of monetary policy. The transmission channels for price-based monetary policy have gradually become smoother, and the impact of interest rates on the real economy has increasingly strengthened. With the advancement of interest rate liberalization, the price discovery function of financial markets has improved, allowing interest rates to transmit more rapidly between financial markets and the real economy, enabling monetary policy to more effectively impact the real economy.

4.4. Clarifying the Monetary Policy Objective System

It is necessary to further clarify the primary and secondary objectives of monetary policy at different stages, with a greater emphasis on the quality and sustainability of economic growth while maintaining price stability. At the same time, it is important to consider objectives such as housing prices and capital market stability to avoid conflicts between objectives, and thereby enhancing the effectiveness of monetary policy regulation.

4.5. Optimizing the Monetary Policy Instrument Mix

It is important to flexibly employ quantity-based and price-based monetary policy tools according to the economic situation and policy objectives. When inflation is severe, quantity-based monetary policy should be the primary approach. Increase the intensity of withdrawing quantitative currency from the market. Meanwhile, as a supplementary measure, the price-based monetary policy can be used to appropriately raise interest rates to curb overheating investment and consumption. During an economic downturn, the price-based monetary policy should take the lead. Lower the key interest rates in the transmission channels. At the same time, with the quantity-based monetary policy as a supplement, increase the money supply to stimulate economic growth. In addition, efforts should be made to strengthen the research, development, and application of new-type monetary policy tools, such as the central bank digital currency. This can enhance the precision and effectiveness of monetary policy.

4.6. Deepening the Reform of Interest Rate Liberalization

Efforts will continue to promote the process of interest rate

liberalization, refine the mechanism for forming market interest rates, broaden the fluctuation range of market interest rates, and increase their flexibility, ensuring they more accurately reflect the supply and demand for funds in the market. Furthermore, the development of a market benchmark interest rate system, such as SHIBOR, will be further cultivated to enhance its benchmarking role and influence within financial markets.

4.7. Enhancing Oversight of Shadow Banking

Given the potential disruption shadow banking can pose to monetary policy transmission, it is crucial to bolster the oversight of shadow banking, standardize its operational activities, and mitigate the financial risks associated with it. A robust monitoring framework for shadow banking will be established and improved to maintain timely awareness of its scale, structure, and risk profile, facilitating the formulation of targeted regulatory measures.

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