RESEARCH ARTICLE

Short-Term Impact of China's Reverse Repo Operations on the Overnight Shibor: Evidence from the Money Market

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Abstract

Based on daily data from China's money market between March and April 2025, this study investigates the short-term effects of the People's Bank of China's (PBC) reverse repo operations on the overnight interbank rate (O/N Shibor). Using Ordinary Least Squares (OLS) regression and an event-study approach, the analysis explores both the quantity-based and price-based transmission mechanisms of monetary policy. Empirical results indicate that an increase in the reverse repo amount significantly reduces the overnight rate at the 5% level, confirming the liquidity-supply channel of quantitative policy and demonstrating that liquidity injections effectively ease short-term funding costs. The reverse repo rate exerts a positive but statistically insignificant influence, suggesting that while its price signal aligns with theoretical expectations, its short-term transmission remains limited. The one-week Shibor has a strong and significant positive impact on the overnight rate, highlighting the dominant role of market expectations. Overall, the findings suggest a three-stage transmission chain—liquidity adjustment, market expectations, and rate response—where reverse repo operations mainly function as a liquidity-relief mechanism shaped by expectation dynamics rather than a direct policy shock.

Keywords: Reverse repo operations, overnight Shibor, market expectations, event study, short-term monetary policy transmission.

1 Introduction

Amid increasing volatility in global financial markets and growing complexity in policy environments, short-term liquidity-management tools have become increasingly vital for central banks. As a key instrument in open market operations, the reverse repurchase agreement (reverse repo) plays a central role in regulating market liquidity, guiding short-term interest rates, and transmitting monetary policy signals. In recent years, with the continuous improvement of China's money market system and the deepening of interest-rate liberalisation,

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reverse repo operations—particularly those with short maturities—have become an important policy lever within the interest-rate corridor framework.

In contrast to traditional quantity-based monetary tools, reverse repo operations primarily influence financial markets through the interest-rate channel. By adjusting short-term policy rates and liquidity conditions, central banks can shape market expectations and stabilise short-term funding costs. In China, the seven-day reverse repo rate has gradually emerged as a benchmark policy rate, exerting growing influence on money market rates such as the Shanghai Interbank Offered Rate (Shibor). Understanding the transmission mechanism of reverse repo operations is therefore crucial for evaluating the effectiveness of China's monetary policy framework.

While existing studies have extensively examined the macroeconomic effects of monetary policy instruments, relatively limited attention has been paid to the short-term transmission effects of reverse repo operations on money market interest rates. In particular, the immediate market response to reverse repo announcements and operations—especially under high-frequency policy adjustments—remains underexplored. Given the increasing reliance on short-term policy tools and the heightened sensitivity of financial markets to policy signals, a focused analysis of the short-term effects of reverse repo operations is both timely and necessary.

Accordingly, this study investigates the short-term impact of reverse repo operations on China's money market by employing an event-study approach, with Shibor serving as the key indicator of market interest rates. By identifying the immediate market responses to reverse repo operations, this paper aims to clarify the transmission logic of short-term monetary policy within the interest-rate corridor mechanism and to provide empirical evidence that can inform the optimisation of central bank liquidity-management practices.

2 Literature Review

2.1 Reverse Repo Operations and Monetary Policy Transmission

At the macro level, the monetary policy transmission mechanism provides the theoretical foundation for understanding the effects of reverse repo operations. Empirical evidence suggests that changes in short-term policy rates exert significant influences on real economic activity and financial markets. For instance, Fernald et al. [1] employ a factor-augmented vector autoregression (FAVAR) to show that interest-rate-based monetary policy in China exerts significant effects on domestic economic activity and inflation, with the interbank market—including Shibor—serving as a primary transmission channel, underscoring the centrality of short-term policy-rate instruments such as the reverse repo rate in China's monetary transmission chain. Similarly, Guo et al. [2] show that the PBC's standing lending facility (SLF)—a liquidity tool that forms the upper bound of China's interest-rate corridor—significantly affects Shibor across maturities, with the transmission operating through both a liquidity-supply effect and an expectation-formation channel, confirming that central bank liquidity instruments shape interbank rates through mechanisms directly analogous to those of reverse repo operations examined in this study.

Cross-country evidence further supports the generalisability of reverse repo transmission: Base [3] employs a VAR model for the Philippines and finds that changes in the reverse repurchase rate influence the output gap, inflation, and exchange rate, with directionally consistent results despite limited statistical significance, underscoring that the interest-rate transmission mechanism of reverse repo operations operates broadly across different central banking frameworks. From a domestic transmission perspective, Sun [4] employs an event-study approach on daily data and finds that quantitative policy announcements—such as changes in required-reserve ratios—generate significant same-day responses in market interest rates, whereas qualitative stance announcements exert little immediate effect, pointing to the primacy of concrete policy actions over verbal communication in shaping short-term rates. Collectively, these studies suggest that short-term policy-rate instruments—such as reverse repos—constitute a core component of modern monetary policy transmission frameworks.

2.2 Reverse Repo Operations as a Liquidity-Management Tool

At the policy-implementation level, reverse repo operations serve as a primary instrument for central banks to manage short-term liquidity conditions. Evidence from China indicates that the expansion of reverse repo operations does not always translate into effective liquidity easing, particularly when constrained by factors such as large-scale government bond issuance [5]. In other emerging economies,

reverse repo operations exhibit heterogeneous effectiveness. For example, in Nepal, reverse repos have been found to be less effective in absorbing liquidity compared with repos, although they remain an indispensable short-term policy tool [6].

Long-term empirical analyses further confirm that reverse repo operations significantly influence interbank interest rates and form an irreplaceable component of interest-rate regulation frameworks [7]. In China, adjustments to the reverse repo rate also function as important policy signals that shape market expectations [8]. Similarly, Qiao and Liu [9] provide direct evidence for China, showing that open market operations—including reverse repos—exert significant effects on money market rates through both a quantity path and a price path, and that operations in which quantity and price signals move in the same direction produce stronger rate impacts, a finding directly relevant to the joint quantity–price framework adopted in the present study. Overall, the literature recognises reverse repo operations as a central instrument for short-term liquidity management and interest-rate steering.

2.3 Methodological Approaches to Evaluating Short-Term Policy Effects

From a methodological perspective, event-study and vector autoregression (VAR) models have been widely applied to assess the effects of monetary policy shocks. Event-study analyses are particularly well suited for identifying immediate market reactions to policy announcements. Using an event-study design analogous to that employed in the present study, Guo et al. [10] document that open market reverse repo operations in China generate significant positive abnormal stock returns during the COVID-19 period, confirming that liquidity injections through reverse repos produce measurable and immediate financial market responses; while the transmission target differs, the event-window identification strategy validates the methodological approach adopted here for detecting short-term transmission dynamics in the money market. High-frequency identification of Chinese monetary policy surprises around PBC announcements provides valuable guidance for variable selection and event-window design [11].

In contrast, VAR models are commonly used to capture the dynamic and lagged effects of monetary policy on macroeconomic variables. Existing research suggests that combining event-study methods with VAR-type analysis can offer a more comprehensive understanding of both short-term and medium-term policy effects [3]. These methodological insights support the suitability of event-study approaches for analysing high-frequency monetary policy tools such as reverse repo operations.

2.4 Market Expectations and Short-Term Interest-Rate Dynamics

At the micro level, short-term interest-rate movements reflect the process of market-expectation formation. Empirical studies indicate that the signalling channel of monetary policy plays a crucial role in guiding expectations in China's interbank market: the seven-day repo rate (R007) transmits the policy stance to financial markets and simultaneously shapes participants' expectations about future liquidity conditions, with short-term interbank rates serving as key pass-through variables in this expectation-formation process [12]. Moreover, Shieh [13] finds that future policy expectations—a "path factor" capturing anticipated rate trajectories—play a larger role than contemporaneous surprises in driving Chinese financial market responses to monetary policy announcements, with interbank rates exhibiting persistent adjustment to policy shocks; this primacy of the expectation channel over direct rate signals corroborates the dominant role of the one-week Shibor in the present model.

Taken together, short-term interest rates—such as Shibor and repo rates—serve as key variables through which monetary policy signals are transmitted to financial markets. Reverse repo operations thus act as an important link between policy objectives and market responses by influencing both liquidity conditions and interest-rate expectations.

2.5 Summary and Research Gap

In summary, the existing literature has extensively examined reverse repo operations from the perspectives of macroeconomic transmission, policy implementation, empirical methodology, and market dynamics. However, most studies focus on long-term or macro-level effects, while relatively little attention is paid to the immediate and short-term transmission mechanisms of reverse repo operations on money market interest rates. In particular, empirical evidence based on event-window analysis of daily data remains limited. This study seeks to address this gap by systematically examining the short-term effects of reverse repo operations on China's money

market, thereby contributing to a more refined understanding of monetary policy transmission within the interest-rate corridor framework.

3 Research Methodology

3.1 Data Sources and Variable Description

The data used in this study are primarily derived from the official announcements of open market operations released by the Monetary Policy Department of the People's Bank of China (PBC), the PBC's official website, and the daily interest-rate data published by the Shanghai Interbank Offered Rate (Shibor) official platform. The sample period covers March to April 2025, during which the PBC conducted multiple seven-day reverse repurchase (reverse repo) operations. This period effectively captures both the central bank's short-term liquidity-management behaviour and the market's immediate interest-rate responses.

3.1.1 Sample Period and Data Collection

The core data employed in this study include:

(1) Shanghai Interbank Offered Rate (Shibor): this indicator systematically reflects the marginal cost of funds across different maturities in the interbank market and serves as an essential pricing benchmark in China's money market interest-rate system.

(2) PBC's seven-day reverse repo operation data, including the daily operation amount and bid rate, which represent the scale of liquidity injection and the policy-rate guidance, respectively.

The selection of this sample period is based on two considerations: first, during the spring of 2025, reverse repo operations were frequent, and marginal liquidity conditions fluctuated significantly, offering an ideal environment for short-term impact analysis; second, the data from this period are transparent and continuous, enabling robust event-window and regression analyses.

3.1.2 Variable Definition

Dependent variable (y_t): the overnight interbank offered rate (O/N Shibor), directly reflecting the short-term cost of interbank funding and serving as a key indicator of liquidity tightness.

Main explanatory variables (X_t):

- Reverse repo operation amount (*Amount*): the daily liquidity injected by the PBC, capturing the intensity of liquidity supply.
- Reverse repo bid rate (*Rate*): the operational interest rate representing the central bank's policy stance and signalling effect.
- One-week Shibor (*W1_Shibor*): a market-expectation variable reflecting the short-term funding outlook and interest-rate term-structure transmission.

Economically, the reverse repo operation serves as the primary instrument for the central bank to manage liquidity and guide short-term interest rates. Changes in the operation amount and bid rate can exert both direct and expectation-driven effects on market funding costs. Meanwhile, the one-week Shibor reflects market expectations of liquidity conditions, potentially influencing the formation of the overnight rate through the expectation channel.

3.1.3 Data Preprocessing

To ensure data continuity and consistency, the Shibor data and reverse repo operation data were matched on a daily basis. For dates without reverse repo operations, both the operation amount and rate were assigned a value of zero to maintain a complete time series. All data were cleaned, standardised, and structured in a Python environment, unified to a daily frequency. The final dataset includes four key variables: O/N Shibor, W1 Shibor, reverse repo operation amount, and reverse repo rate, providing a solid empirical foundation for subsequent regression and event-window analyses.

3.2 Empirical Model Specification

To identify the effect of the PBC's reverse repo operations on short-term money market rates, this study constructs a linear regression model with the overnight interbank rate (O/N Shibor) as the dependent variable, supplemented by an event-window analysis to capture the short-term transmission mechanism of liquidity operations. The modelling framework aims to characterise the immediate market response and dynamic adjustment of short-term rates from both quantitative (liquidity volume) and price (policy rate) perspectives.

3.2.1 Model Logic and Research Framework

The reverse repo operation is a core instrument of the PBC's open market operations. By injecting or withdrawing liquidity, it directly influences the supply–demand balance of funds in the interbank market, thereby affecting market interest rates.

Theoretically, an increase in operation amount indicates liquidity expansion, easing short-term funding pressures and lowering interest rates; in contrast, an increase in the bid rate sends a tightening signal, potentially raising market rates. Meanwhile, the one-week Shibor represents market expectations regarding short-term liquidity, and its fluctuations reflect the dynamic adjustment of expectations toward central bank actions. Hence, this study incorporates the operation amount, operation rate, and one-week Shibor jointly as explanatory variables to capture the interactive dynamics between policy actions, market expectations, and funding costs.

3.2.2 *Baseline Model*

The empirical estimation adopts an Ordinary Least Squares (OLS) approach to measure the immediate impact of reverse repo operations. The model is specified as follows:

$$\begin{aligned} \text{ON_Shibor}_t = &\alpha + \beta_1 \,\text{Amount}_t + \beta_2 \,\text{Rate}_t \\ &+ \beta_3 \,\text{W1_Shibor}_t + \varepsilon_t \end{aligned} \tag{1}$$

where ON_Shibor_t denotes the overnight interbank offered rate, representing short-term market liquidity; Amount_t refers to the daily reverse repo operation amount; Rate_t represents the reverse repo bid rate; W1_Shibor_t denotes the one-week Shibor, capturing market expectations; and ε_t is the stochastic disturbance term, accounting for unobserved short-term fluctuations.

3.2.3 *Parameter Expectations and Economic Interpretation*

According to the monetary policy transmission framework, the expected signs of the parameters are as follows:

- $\beta_1 < 0$: an increase in operation amount expands liquidity supply, reducing short-term interest rates.
- $\beta_2 > 0$: a higher reverse repo rate signals policy tightening, pushing market rates upward.
- $\beta_3 > 0$: an increase in one-week Shibor reflects tighter expected liquidity conditions, exerting upward pressure on overnight rates.

3.2.4 *Event-Window Design*

To further identify the immediate and short-term effects of reverse repo operations, the study incorporates an event-study methodology. The operation day is defined as the event day (Day 0), and a three-day event window $[-1, 0, +1]$ is constructed, covering the trading day before (Day -1), the event day (Day 0), and the following trading day (Day $+1$). The study examines changes in O/N Shibor within this window by comparing mean and standard-deviation variations with non-event periods, thereby identifying the short-term transmission features and timeliness of reverse repo shocks.

3.2.5 *Model Estimation and Robustness*

The model estimation is implemented using the `statsmodels` library in Python. OLS regression results are evaluated through fitted values and residual normality tests to assess model adequacy. To verify the normality assumption formally, a Jarque–Bera test was applied to the residuals. The test statistic is 0.847 ($p = 0.655$), providing no evidence against normality at conventional significance levels, consistent with the visual diagnostics presented below. To further enhance robustness, future extensions could incorporate lagged terms or employ Vector Autoregression (VAR) and Local Projection (LP) models to explore the dynamic propagation and time-varying characteristics of reverse repo shocks.

4 Results

4.1 Regression Analysis

To examine the impact of the PBC's reverse repurchase (reverse repo) operations on short-term money market rates, this study conducts an OLS regression using daily data from March to April 2025, with the overnight interbank offered rate (O/N Shibor) as the dependent variable. The regression results are presented in Tables 1 and 2.

Overall, the model's goodness of fit is satisfactory, with an R^2 of 0.502 and an adjusted R^2 of 0.428, indicating that approximately 43–50% of the variation in overnight interest rates is explained by the selected variables. The F-statistic (6.845) is significant at the 1% level ($\text{Prob}(F) = 0.0031$), confirming that the explanatory variables jointly have a significant effect on O/N Shibor fluctuations.

Reverse Repo Amount (*Amount*). The coefficient (-7.12×10^{-5}) is statistically significant at the 5% level ($P = 0.020$) and has the expected negative sign, indicating that larger-scale reverse repo operations significantly reduce overnight interbank rates. This confirms the liquidity-supply channel of quantitative monetary policy, showing that liquidity injections effectively ease short-term funding costs.

Reverse Repo Rate (*Rate*). The coefficient (0.0499) is positive, consistent with theoretical expectations

Table 1. OLS regression results: impact of reverse repo operations on O/N Shibor.

Variable	Coef.	Std. Err.	t	$P > \|t\|$	95% CI
Constant	0.9286	0.200	4.633	0.000	$[0.510, 1.347]$
Reverse Repo Amount	-7.12×10^{-5}	2.85×10^{-5}	-2.507	0.020	$[-1.30\times10^{-4}, -1.17\times10^{-5}]$
Reverse Repo Rate	0.0499	0.041	1.207	0.242	$[-0.036, 0.136]$
1-Week Shibor	0.4414	0.116	3.795	0.001	$[0.199, 0.684]$

Table 2. Model-fit summary.

Indicator	Value
Sample size (N)	24
R^2	0.502
Adjusted R^2	0.428
F-statistic	6.845
Prob(F)	0.0031

that higher policy rates exert upward pressure on short-term market rates. Although not statistically significant ($P = 0.242$), the sign indicates that policy rates still serve as signals guiding short-term rate movements.

1-Week Shibor (*W1_Shibor*). The coefficient (0.4414) is highly significant at the 1% level ($P = 0.001$), suggesting that expectations of tighter future liquidity significantly raise the overnight rate. This underscores the role of expectations-driven market behaviour in explaining short-term interest-rate variations.

Constant term. The constant (0.9286) is significant at the 1% level, representing the baseline level of O/N Shibor after controlling for central bank operations and market expectations. This may reflect structural liquidity frictions and risk premia inherent in the interbank market.

Overall, the regression results validate the existence of a three-stage transmission chain—liquidity-quantity adjustment $\rightarrow$ market expectations $\rightarrow$ short-term interest-rate response. Both the reverse repo amount and the 1-week Shibor significantly affect overnight rates, the former via direct liquidity provision and the latter via expectations. Although the reverse repo rate is not statistically significant, its sign aligns with theoretical predictions, suggesting that the policy rate retains directional signalling power in the short term.

4.2 Event-Study Results: Immediate Market Effects of Reverse Repo Operations

To further test the robustness and dynamic characteristics of the regression results, this study applies an event-study framework to examine the immediate market reaction to reverse repo operations. Each reverse repo announcement date is defined as the event day (Day 0), and a three-day event window $[-1, 0, +1]$ is constructed. The dependent variable is the daily change in the overnight interbank rate (O/N Shibor). Figure 1 presents the average change in O/N Shibor within the event window and the associated standard-deviation range.

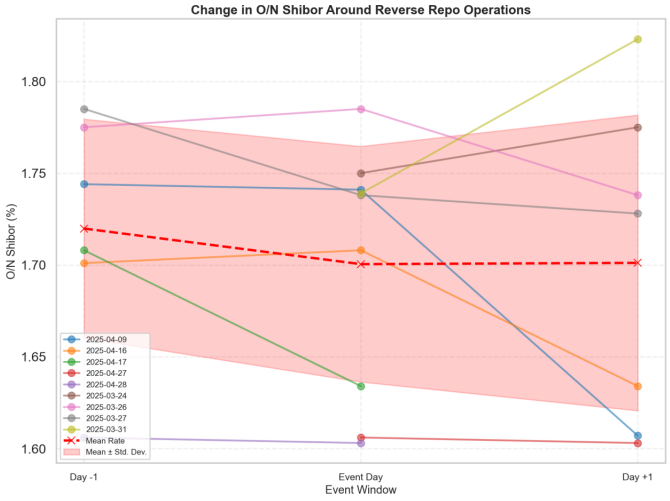

Figure 1. Average change in the overnight rate within the event window.

The average path (red dashed line) shows that the overnight rate was approximately 1.72% on Day -1, dropped slightly to 1.70% on Day 0, and remained around 1.70% on Day $+1$. This trend aligns with the theoretical expectation that reverse repo injections lower short-term rates, but the magnitude of the effect is limited and primarily concentrated on the event day. The lack of a continued decline on Day $+1$ suggests that the impact of reverse repos is short-lived.

The standard-deviation bands indicate heterogeneity across events. Some operations led to a significant drop in O/N Shibor, confirming that liquidity injections ease funding tightness, while in rare cases (e.g. 31 March 2025) the rate rose on Day $+1$, possibly due to overlapping liquidity shocks or concurrent operations such as MLF expirations. This indicates that the isolated impact of reverse repos is easily masked by

other market forces in high-frequency data.

The direction of average rate change within the event window is consistent with the negative coefficient of reverse repo amount in the regression model, reaffirming the liquidity-easing effect. Conversely, rate increases in a few events correspond with the positive sign of the reverse repo rate coefficient, suggesting that policy-rate signals may prompt temporary upward adjustments in market rates.

In summary, the event analysis corroborates the regression findings: reverse repo operations exert limited but directionally consistent effects on short-term rates; liquidity marginal effects dominate, while market expectations (1-week Shibor) play a stronger explanatory role; and heterogeneous event responses highlight the influence of seasonal factors, operation scale, and concurrent policy interventions. Overall, reverse repo operations influence overnight rates in the expected direction but with limited magnitude, reflecting the market's partial absorption and rapid equilibrium adjustment to central bank signals.

4.3 Residual Diagnostics

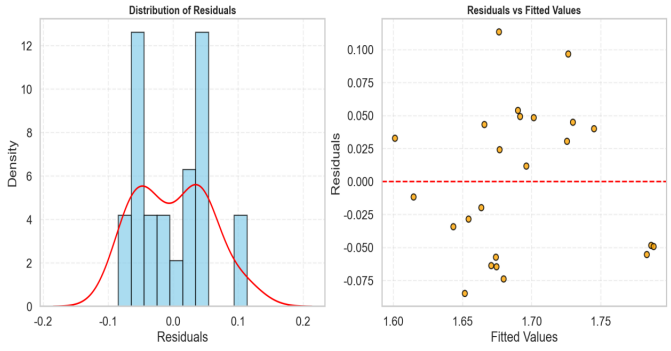

Figure 2. Residual distribution diagnostics.

To ensure the unbiasedness and validity of the OLS estimates, residual diagnostics were performed from three perspectives: distributional shape, independence from fitted values, and normality verification via quantile–quantile analysis. Figure 2 reports the residual distribution and the residual-versus-fitted plot, and Figure 3 reports the Q–Q plot.

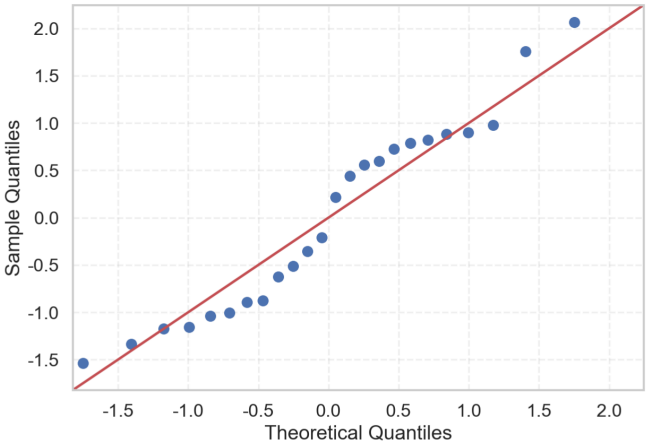

Figure 3. Residual Q–Q plot.

In the left panel, the blue histogram depicts the empirical residual density, while the red curve represents the theoretical normal distribution. The residuals are broadly centred around zero, with peak and tail behaviour reasonably matching the normal distribution. This supports the normality assumption of the disturbance term (ε_t), underpinning the validity of t-tests and confidence intervals for coefficient inference.

The right panel examines the relationship between residuals and fitted values. Residuals are scattered around the zero baseline (red dashed line) with no obvious systematic trend, and no strong sign of heteroskedasticity. This is consistent with the independence and homoscedasticity assumptions.

The Q–Q plot compares sample residual quantiles with theoretical normal quantiles. Most points align closely with the reference line, with minor deviations in the upper tail attributable to the small sample size—an acceptable deviation in such settings. The overall pattern confirms that the residuals follow an approximately normal distribution.

Therefore, the OLS regression model in this study broadly satisfies the key assumptions of normality, homoscedasticity, and independence, supporting the statistical reliability of the estimated coefficients and providing a methodological foundation for the economic interpretations and event-study findings presented above.

5 Discussion and Conclusions

5.1 Integrated Discussion of Empirical Findings

Building on the regression and event-study evidence, this study provides a more nuanced understanding of the short-term transmission mechanism of the PBC's

reverse repo operations. Rather than acting as a uniformly powerful policy lever, reverse repos operate through a multi-layered and temporally asymmetric transmission process.

First, the results confirm the existence of a liquidity-driven quantity channel, whereby increases in reverse repo operations significantly reduce overnight funding costs. However, the event-study evidence shows that this effect is highly front-loaded and short-lived, largely dissipating within one trading day. This suggests that the interbank market rapidly absorbs central bank liquidity injections, reaching a new equilibrium with minimal persistence. In this sense, reverse repos function less as a tool for sustained rate control and more as an instrument for fine-tuning transient liquidity imbalances.

Second, the price-based signalling channel—proxied by the reverse repo rate—appears to be directionally valid but statistically weak in this daily setting. This finding reflects an important institutional feature of China's monetary policy framework: the coexistence of multiple policy instruments and segmented market structures may dilute the immediate impact of policy-rate adjustments. As a result, the signalling function of policy rates operates more through expectation formation over time than through instantaneous market repricing.

Third, and most importantly, the results highlight the dominant role of the expectations channel. The strong and significant relationship between the 1-week Shibor and the overnight rate indicates that market participants form forward-looking assessments of liquidity conditions, which in turn shape current pricing. This implies that short-term interest-rate dynamics are not purely reactive to contemporaneous policy actions but are instead embedded in a broader anticipatory framework of market expectations.

Finally, the observed event heterogeneity underscores the conditional nature of policy effectiveness. The impact of reverse repo operations varies depending on concurrent liquidity shocks, overlapping policy tools (e.g. MLF operations), and seasonal factors such as quarter-end regulatory pressures. This reinforces the view that monetary policy transmission in high-frequency money markets is inherently state-dependent and context-sensitive.

Taken together, these findings suggest that the short-term interest-rate formation mechanism in China's interbank market can be characterised as a three-stage transmission chain: *liquidity injection → expectation adjustment → short-term rate realisation*. However, the relative strength of each stage is uneven, with the expectations channel playing a structurally dominant role.

5.2 Policy Implications: From Liquidity Management to Expectation Governance

The empirical findings carry several important implications for both monetary policy design and broader socio-economic governance.

5.2.1 From quantity control to precision liquidity management

Given the significant but short-lived impact of reverse repo operations, the PBC should position them as a high-frequency liquidity-management tool rather than a mechanism for persistent rate control. This implies a shift toward more granular and state-contingent operations, where timing, scale, and frequency are calibrated to micro-level liquidity conditions.

5.2.2 Reinforcing the institutional credibility of policy-rate signals

The weak statistical significance of the reverse repo rate does not imply irrelevance; rather, it points to the need to strengthen its institutional transmission environment. Enhancing the clarity and consistency of the interest-rate corridor, improving transparency in policy communication, and reducing ambiguity across multiple instruments can help transform the policy rate into a more credible anchor for market expectations.

5.2.3 Elevating expectation management as a core policy dimension

The prominence of the expectations channel suggests that monetary policy increasingly operates not only through liquidity provision but also through information and communication mechanisms. Clear forward guidance, consistent signalling, and timely disclosure of policy intentions can reduce uncertainty, stabilise market sentiment, and improve transmission efficiency. From a broader social perspective, stable short-term interest rates contribute to predictable financing conditions, which are crucial for financial institutions, firms, and ultimately households.

5.2.4 Coordinating multiple policy instruments within an integrated framework

The heterogeneity observed in event responses highlights the importance of policy coordination. Reverse repos do not operate in isolation; their effectiveness depends on interactions with

other instruments such as MLF operations and reserve-requirement adjustments. A fragmented policy approach may weaken transmission, whereas an integrated framework can generate complementary and reinforcing effects.

5.2.5 *Strengthening data-driven policy monitoring and feedback loops*

Given the sensitivity of short-term rates to expectations and high-frequency shocks, there is a strong case for developing real-time monitoring and forecasting systems. By incorporating high-frequency data analytics and scenario simulations, the central bank can better anticipate liquidity conditions and adjust operations proactively.

5.3 Broader Implications for Social and Policy Analysis

Beyond the technical domain of monetary operations, this study contributes to the understanding of how central bank governance mechanisms—specifically, the design and communication of liquidity-management tools—propagate policy signals through financial systems and influence broader socio-economic behaviour, themes that lie at the heart of social systems and policy analysis. First, the findings suggest that modern monetary policy increasingly resembles a process of expectation coordination, in which credibility, transparency, and communication are as important as traditional liquidity tools. Second, the short-lived nature of liquidity effects implies that financial markets are highly efficient in absorbing policy interventions, but also potentially more sensitive to information shocks and uncertainty. Finally, by linking high-frequency monetary operations to expectation dynamics, this study provides a micro-level perspective on how policy actions translate into macro-level financial stability.

5.4 Limitations and Directions for Future Research

This study has several limitations that open avenues for further research. First, the sample period is relatively short ($N = 24$) and confined to a specific policy environment, which may limit the external validity of the findings. Future research could extend the dataset across different monetary policy regimes to examine the stability of the identified transmission mechanisms. Second, the analysis focuses on short-term effects and does not capture the dynamic persistence of policy impacts; incorporating time-series models such as VAR, SVAR, or time-varying-parameter frameworks would allow a more comprehensive assessment of dynamic transmission and lag structures. Third, the study relies on a single market indicator (O/N Shibor); future work could expand the analysis to include repo rates across maturities, bond yields, and asset prices. Finally, future research could explore the interaction between policy communication and market expectations, potentially integrating textual analysis of central bank announcements or market-sentiment indicators.

Data Availability Statement

All data analysed during this study are derived from publicly available sources. Reverse repo operation data are available from the Monetary Policy Department of the People's Bank of China (https://www.pbc.gov.cn), and Shibor data are available from the official Shibor platform (https://www.shibor.org).

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Conflicts of Interest

The authors declare no conflicts of interest.

AI Use Statement

The authors declare that no generative AI was used in the preparation of this manuscript.

Ethical Approval and Consent to Participate

Not applicable.

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