The Impact of Margin Trading Mechanism on Stock Mispricing: Evidence from a Difference-in-Differences Approach

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Abstract. The margin trading and short selling mechanism, as a significant institutional innovation in China's capital market, has drawn considerable attention regarding its impact on stock mispricing. This study selects China's A-share market from 2007 to 2017 and employs the pilot implementation in 2010 and subsequent batch expansions of the margin trading system as a quasi-natural experiment. Using a Difference-in-Differences (DID) model, this paper investigates the effect of the margin trading mechanism on stock mispricing. The treatment group consists of stocks included in the margin trading list, while the control group comprises non-listed stocks. Empirical results indicate that the implementation of the margin trading mechanism significantly reduces industry-level mispricing. Robustness checks, including parallel trend tests and Propensity Score Matching (PSM), confirm the findings.

Keywords: Margin Trading and Short Selling; Stock Mispricing; Difference-in-Differences Model; Pricing Efficiency; A-Share Market

1 Introduction

The margin trading and short selling mechanism, introduced as a pilot in China's capital market in 2010, represents a crucial institutional innovation. Its effectiveness in influencing stock mispricing—a key determinant of market efficiency and resource allocation—remains a central focus for both academia and industry. Drawing on international experience, mature markets often view short-selling mechanisms as tools to curb overvaluation and enhance pricing efficiency (Fang, Huang, & Karpoff, 2016 [6]). However, China's market, characterized as "emerging and transitioning" with a dominant retail investor base and speculative tendencies, may exhibit different dynamics. Existing literature presents mixed findings: some studies suggest the mechanism improves pricing efficiency by introducing more information and disciplining managerial behavior (Chang, Luo, & Ren, 2014[4]), while others argue that constraints like high short-selling costs and a dominant margin-buying culture may limit its effectiveness or even exacerbate mispricing (Hong, Scheinkman, & Xiong, 2006[8]). This study aims to contribute

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to this debate by leveraging the phased expansion of the margin trading list as a natural experiment. Using a DID framework, it provides a more rigorous causal identification of the mechanism's impact on stock mispricing, addressing potential endogeneity concerns prevalent in prior research.

2 Literature Review and Hypothesis Development

The economic consequences of margin trading have been extensively studied. Supportive arguments emphasize its role in improving price discovery. By allowing investors to trade on negative information, short selling can expose overvaluation, reduce earnings management, and curb controlling shareholders' tunneling behavior, thereby enhancing corporate governance and pricing efficiency (Callen & Fang, 2015[5]). Conversely, skeptical views highlight the constraints in the Chinese context. High barriers to short selling, limited stock coverage, and a market structure favoring margin purchases may foster speculative bubbles rather than correct mispricing (Grullon, Michenaud, & Weston, 2015[7]). Furthermore, the pressure to maintain inflated stock prices might induce managerial myopia, distorting investment decisions away from long-term value creation (Stein, 1989[10]). Based on the theoretical tension between the price-correcting potential of short selling and the market-specific constraints in China, we propose two competing hypotheses:

H1: The implementation of the margin trading mechanism can alleviate the degree of mispricing in the financial market.

H2: The implementation of the margin trading mechanism cannot alleviate the degree of mispricing in the financial market.

3 Research Design

Our sample spans Chinese A-share listed companies from 2007 to 2017, centered around the 2010 pilot. We apply standard filters: excluding financial firms, loss-making firms (negative net profit), ST/*ST companies, firms delisted from the margin trading list, and observations with missing key variables. All continuous variables are winsorized at the 1st and 99th percentiles. The final dataset is an unbalanced panel of 22,218 firm-year observations (20,021 after regression-specific filters). Data is sourced from the CSMAR database, Wind, and official stock exchange websites.

Following Rhodes-Kropf, Robinson, and Viswanathan (2005) [9]and Baker and Wurgler (2006)[1], we decompose the market-to-book (M/B) ratio to measure mispricing. The decomposition separates firm-specific deviation, industry-level deviation, and firm growth. Our primary variable of interest is *Misp*, capturing the industry-level pricing deviation. A higher value indicates greater industry overvaluation. To assess the impact of margin trading, we estimate a multi-period DID model:

$$Misp_{i,t}=\alpha_0+\alpha_1 PostList_{i,t}+\alpha_2 List_{i,t}+\alpha_3 \mathbf{CVs}_{i,t}+\sum Year+\sum Industry+\varepsilon_{i,t} \quad (1)$$

Where:

$Misp_{i,t}$: Industry-level mispricing for industry i in year t.

$PostList_{i,t}$: A dummy variable equal to 1 for firm i in the years after it is included in the margin trading list.

$List_{i,t}$: A dummy variable equal to 1 if firm i is ever included in the margin trading list during the sample period.

$\boldsymbol{CVs}_{i,t}$: A vector of control variables, including firm size (*Size)*, leverage (*Lev)*, growth opportunity (*Growth*), annual stock return (*Ret)*, and share turnover (*OTurn*).

Year and *Industry*: *Year* and *Industry* fixed effects.

Variable definitions are summarized in Table 1.

Table 1. Variable definitions and measurement methods

Variable	Definition
Misp	Industry-level pricing deviation (absolute value used in regressions).
PostList	Dummy variable (=1 for firm-years after being listed as a margin trading stock).
List	Dummy variable (=1 if the firm is ever a margin trading stock).
Size	Natural logarithm of total assets.
Lev	Total liabilities divided by total assets.
Growth	Firm's real growth potential (residual from M/B decomposition).
Ret	Annual stock return with cash dividends reinvested.
OTurn	Annual turnover rate (trading volume / total shares outstanding × 100%).

4 Empirical Analysis

4.1 Descriptive Statistics

Table 2 presents descriptive statistics. The mean of *Misp* is 0.192, with significant variation (SD=0.349). The median (0.241) is higher than the mean, indicating a right-skewed distribution. A simple mean difference test (Table 3) shows that listed firms (List=1) have significantly lower mispricing (0.16) than non-listed firms (0.24) after 2010, providing preliminary support for H1. Fig. 1 illustrates the parallel trend before 2010 and a diverging path afterwards. *** denotes significance at the 1% level.

Table 2. Descriptive Statistics of Main Variables.

Variable	*N*	Mean	Std. Dev.	Min	Median	Max
Misp	19,851	0.192	0.349	-1.024	0.241	1.773
PostList	20,021	0.163	0.370	0.000	0.000	1.000
List	20,021	0.412	0.492	0.000	0.000	1.000
Size	20,021	21.989	1.273	18.724	21.823	26.186
Lev	20,021	0.437	0.216	0.031	0.433	2.147
Growth	20,021	0.265	0.701	-0.728	0.137	7.671
Ret	19,656	0.291	0.811	-0.828	0.057	6.465
OTurn	20,019	666.671	506.294	0.674	527.339	4911.758

Table 3. Difference in Mispricing between Listed and Non-Listed Firms (Post-2010 Sample).

Variable	Listed Firms (*List*=1)	Non-Listed Firms (*List*=0)	Mean Difference
	Mean	Mean	0.349
Misp	0.16	0.24	0.077***
Obs.	6452	10022	

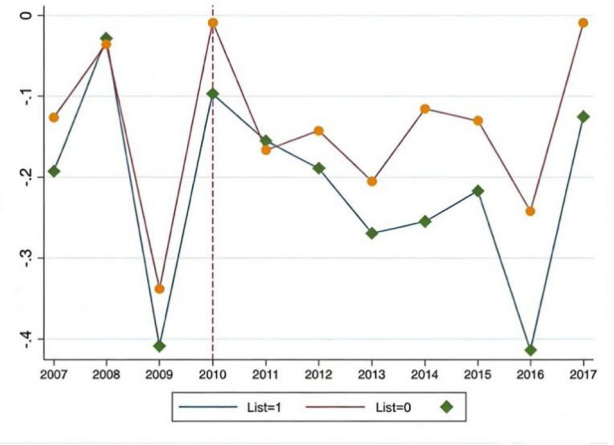

Fig. 1. Time Trend of Mispricing for Listed vs. Non-Listed Firms. Note: The dashed line indicates the 2010 policy implementation.

4.2 Regression Analysis

The baseline regression results are presented in Table 4. The coefficient on *PostList* is negative and statistically significant at the 1% level across all specifications (Columns 1-2). This indicates that being included in the margin trading list leads to a significant reduction in industry-level mispricing, supporting H1. The results remain robust in various subsamples excluding key expansion years (Columns 3-6), though the effect shows a diminishing magnitude over time.

Table 4. Impact of Margin Trading Mechanism on Stock Mispricing: Regression Results.

Variable	(1) Full Sample	(2) Full Sample	(3) Excl. 2010	(4) Excl. 2012	(5) Excl. 2013	(6) Excl. 2014
PostList	-0.080***	-0.061***	-0.038***	-0.075***	-0.036***	-0.011**
	(-15.07)	(-11.51)	(-3.43)	(-12.82)	(-6.29)	(-1.97)
List	0.013***	0.026***	0.013***	0.026***	0.016***	0.014***
	(3.89)	(7.64)	(3.44)	(7.07)	(4.00)	(2.96)
Controls	No	Yes	Yes	Yes	Yes	Yes
Year/Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
N	19851	19489	9001	13876	11467	11062
Ret	0.838	0.845	0.819	0.874	0.873	0.870
Adj. R²	19851	19489	9001	13876	11467	11062

Notes: t-statistics in parentheses. *** p<0.01, ** p<0.05. Controls include *Size*, *Lev*, *Growth*, *Ret*, *OTurn*.

5 Empirical Analysis

To ensure the reliability of the Difference-in-Differences (DID) model estimation results, this study first tests the parallel trend assumption between the treatment and control groups prior to the policy intervention. Following the methodology outlined in classic literature (Bertrand & Mullainathan, 2003[3]; Beck et al., 2010[2]), a cross-period dynamic effects model is constructed to test the parallel trend assumption for the multi-period DID model, focusing on whether systematic differences existed before stocks were included in the margin trading list.

$$Misp_{i,t}=\alpha_0+\sum\alpha_k PostList_{i,t}^{\pm k}+\alpha_8 \mathbf{CVs}_{i,t}+\sum Year+\sum Industry+\varepsilon_{i,t} \quad (2)$$

Here, $PostList^{-k}$ and $PostList^{+k}$ are dummy variables indicating the k-th year before (or after) a stock's inclusion in the margin trading list (k=1,2,3), taking a value of 1 in the corresponding year and 0 otherwise. It is important to note that $PostList^{-3}$ ($PostList^{+3}$) represents the period three years or more before (after) inclusion. For the research results to be robust, the confidence intervals for $PostList^{-2}$ and $PostList^{-3}$ in the regression results of the above model should encompass 0, meaning their coefficients should be statistically insignificant.

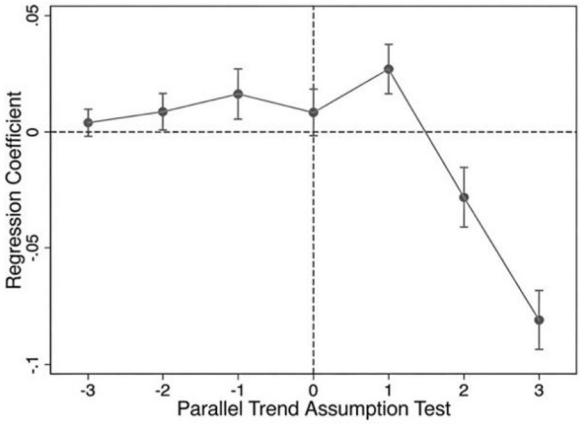

Fig. 2. Parallel Trend Test: Dynamic Effects of Margin Trading Listing.

Figure 2 presents the estimation results of the dynamic effects model, with solid lines representing the 95% confidence intervals. Two key features can be observed: First, in the pre-policy implementation periods, the mispricing levels of the treatment and control groups maintained a highly consistent trend of change. Although the coefficients for the leading terms are positive, their confidence intervals all encompass 0 and are statistically insignificant ($p>0.1$), satisfying the parallel trend assumption. Second, after policy implementation, the coefficient for $PostList^{+1}$ is positive but not significant, possibly reflecting a market adaptation period to the new system. In contrast, the coefficients for $PostList^{+2}$ and $PostList^{+3}$ are both significantly negative at the 5% level, with confidence intervals not encompassing 0. This indicates that the inhibitory effect of the

margin trading mechanism on mispricing is persistent and progressively strengthens over time.

This test result not only validates the prerequisite assumption of the DID model but also reveals the dynamic evolution pattern of the policy effect: the corrective effect of the margin trading system on stock mispricing requires time to fully materialize, which is consistent with theoretical expectations regarding market learning effects and information digestion processes.

To address potential sample selection bias, we use PSM (1:1 nearest neighbor) based on pre-listing characteristics (*Size*, *Lev*, *Growth*, *Ret*, *OTurn*, *Industry*). The DID regression on the matched sample (Table 5) yields a significantly negative coefficient for *PostList*, confirming the robustness of our main conclusion.

Table 5. Robustness Check using Propensity Score Matched Sample.

Variable	(1) *Misp*	(2) *Misp*
PostList	-0.031***	-0.009*
	(-6.77)	(-1.90)
List	-0.004	0.009***
	(-1.14)	(2.78)
Controls	No	Yes
Year/Industry FE	Yes	Yes
N	12,841	12,841
Adj. R²	0.837	0.849

Notes: t-statistics in parentheses. *** p<0.01, * p<0.1.

6 Conclusion and Implications

This study provides robust causal evidence that China's margin trading mechanism reduces industry-level stock mispricing. The findings suggest that the mechanism, particularly through the short-selling channel, enhances informational efficiency and disciplines market valuations, even within China's unique market context. The implications are threefold:

1.For Regulators: The results support further liberalization of the mechanism, such as expanding the list of eligible stocks and reducing short-selling costs, to amplify its price-correcting benefits.

2.For Investors: Understanding this pricing effect can inform investment strategies, particularly regarding stocks newly added to the margin trading list.

3.For Corporate Governance: The threat of short selling may indirectly discipline managers and controlling shareholders, aligning their actions more closely with long-term firm value.

Future research could explore heterogeneous effects across different firm types and market conditions.

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