

The Initial Framework of Short Selling Mechanisms and Corporate Financial Irregularities in Publicly Traded Firms

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Abstract

The efficiency of capital allocation in financial markets depends heavily on the integrity and transparency of corporate disclosure. Repeated financial irregularities have remained a major obstacle to the development of China's securities market. With the pilot launch of the margin trading and short selling system in 2010, short-selling mechanisms were formally introduced into China's capital market. This policy change was expected to improve external monitoring of listed firms and limit managerial behavior motivated by self-interest. Using a dataset of A-share publicly traded firms from 2010 through 2020, this study empirically tests the regulatory effect of short-selling mechanisms on corporate financial irregularities. It also examines whether this relationship changes with the quality of internal control systems and the structure of corporate ownership. The results indicate that the implementation of short-selling rules can significantly reduce financial irregularities in publicly traded firms. The pattern is stable. It remains true after multiple robustness checks. The heterogeneity analysis further shows that the restraining effect of short-selling mechanisms on financial irregularities becomes stronger when internal controls are of higher quality, which points to a complementary relationship between internal and external governance systems. A similar difference appears across ownership types. The governance effect of short selling is stronger in privately owned enterprises than in state-owned ones. These findings add to the research on market-based governance and offer practical support for improving short-selling regulations and increasing the deterrent effect against corporate irregularities in China's capital market.

Keywords

Short Selling System; Financial Irregularities; Internal Control; Nature of Ownership; Corporate Governance.

1. Introduction

Capital markets allocate resources well only when corporate disclosures are credible and transparent, but this condition remains uneven among China's listed firms. Even with continuing regulatory efforts, financial irregularities by publicly traded companies have persisted for a long time in China's capital markets. Preventing listed companies from engaging in such irregularities has therefore become a major concern for both academic researchers and industry practitioners.

In March 2010, China launched a pilot program for margin trading to improve the institutional setup of the capital market and make pricing and governance more effective. This marked the formal introduction of short selling into the A-share market. Under this market-based trading mechanism, investors can trade on negative information. In theory, short selling may speed up the incorporation of bad news into stock prices through price discovery, and it may also put

pressure on corporate management from outside the firm. This differs from traditional administrative regulation. The short selling mechanism relies on the profit motive of market participants, who search for and respond to unfavorable information about listed firms on their own. That creates some *ex ante* restraint on managerial opportunism and can also generate *ex post* discipline. The main question, then, is whether this form of market-based external governance can actually operate effectively in practice and produce clear effects.

How can the financial irregularities of publicly traded companies be reduced? Does the effectiveness of these governance measures depend on the quality of a firm's internal control systems and its ownership structure? These questions still need further empirical study.

Against this background, the present study uses Chinese A-share listed companies from 2010 to 2020 as the research sample to examine how the short selling mechanism affects corporate financial irregularities. The main contributions of this research are as follows. This study focuses on the agency problem of financial irregularities and, in doing so, adds to the literature on the external governance effects of short selling. Earlier studies have mostly discussed the governance role of short selling through earnings manipulation and stock price collapse risk. Here, the paper looks directly at financial irregularities, which are a more serious form of opportunistic behavior, and this makes it possible to test more directly whether short selling can restrain managerial fraud. This paper also includes the quality of internal controls and the nature of property rights as moderating variables, so the analysis does not stop at a single average effect. Instead, it considers the conditions under which governance works better or worse. More specifically, the study examines how internal and external governance mechanisms interact, and how the results differ across different property rights under systemic influences. This matters. It provides another way to understand how market-based governance operates in practice. The findings also have clear policy value. They provide empirical support for regulators seeking to improve the securities lending framework and point to the role market mechanisms can play in supervision. At the same time, the results offer practical reference points for strengthening the internal governance structures of publicly traded companies and for building a coordinated system to deter violations from both internal and external sides.

2. Literature Review

2.1. Foreign Research Status

A large body of research on global equity markets shows that short selling helps move negative information into stock prices. Boehmer et al. (2008) [1] support the informed-trader view of short selling, finding that short sellers' trading behavior tends to anticipate future price movements.

Boehmer et al.'s analysis of New York Stock Exchange data found that short selling significantly anticipates stock returns. Using cross-border data, Saffi and Sigurdsson [2] found that markets with fewer short-selling restrictions have greater pricing efficiency, so information enters prices more quickly. As this line of research developed, attention shifted to corporate governance and to whether short selling limits managerial opportunism. Using the SEC pilot program as a quasi-natural experiment, Fang et al. (2016) [3] document a causal link between eased short-selling constraints and improved financial reporting quality. Massa et al. [4] reached similar conclusions from international data. The pattern is fairly consistent. De Angelis et al. [5] showed that pressure from short selling can improve how efficiently corporations allocate capital. Work on financial irregularities points in the same direction, though through a more specific channel. Karpoff and Lou [6] found that short sellers can identify companies engaged in fraudulent financial activities in advance. Hirshleifer et al. [7] observed that short sellers are especially sensitive to unusual signals in financial reports. Christensen et al. [8] found that the governance effect of short selling is strongest in companies with a weak

information environment and limited analyst coverage, where it partly makes up for weaker oversight.

2.2. Domestic Research Status

After China launched the margin trading and short selling (MTSS) pilot program in 2010, more empirical studies began to look at what it meant for the governance of listed firms. Early domestic research focused mainly on whether margin trading improved how efficiently stock prices reflected information. Li Zhisheng and colleagues[10], for example, found that the introduction of margin trading substantially improved the pricing accuracy of the related stocks, reduced stock price co-movement, and improved the market's overall informational efficiency. Later, the focus moved from stock pricing to corporate behavior. Xiao Hao and Kong Aiguo[9] found that the introduction of short-selling mechanisms significantly reduced earnings manipulation in listed firms and improved corporate information transparency. Chen Yu[11] reached a similar conclusion, showing that the margin trading system could significantly improve the quality of accounting information disclosed by the firms involved.

Xu Xixiong and associates [12] used a Difference-in-Differences (DID) model to study corporate misconduct and short selling tactics. They found that after the short selling system was introduced, the likelihood of violations by targeted firms fell. At the same time, these violations were more likely to be detected, and the investigation timeline became shorter. Taken together, these results suggest that short selling regimes improve oversight efficiency. Chen Huili and Liu Feng[13] found that after short sale restrictions were removed, both accrual-based and real earnings management declined among the affected companies. The pattern is fairly clear. It suggests that the short selling framework can limit managerial manipulation of earnings in more than one form. Looking at financial restatements, Chu Jian and Fang Junxiong[14] found that the margin trading and short selling system reduced the incidence of financial restatements. This adds further support to the view that short selling mechanisms improve the accuracy and reliability of financial reporting.

Researchers have also examined why governance effects differ across firms. Chu Jian and Fang Junxiong [14] found that the restraining effect of margin trading mechanisms on financial restatements is stronger in privately-owned firms and in sectors with intense market rivalry. Looking at ownership structure, Peng Wenping [15] shows that enterprises not under state control respond more strongly when short-selling restrictions are relaxed, and that the governance effect of short-selling frameworks is stronger in these non-state-owned entities. Internal firm conditions also matter. Yang Qing et al. [16] found that stronger internal control systems increase the deterrent effect of short-selling mechanisms on corporate misconduct, which suggests that internal and external governance can reinforce each other. A similar pattern appears from the perspective of institutional investors. Quan Xiaofeng and Yin Hongying [17] reported that equity stakes held by institutional investors strengthen the external governance effect of short selling mechanism and increase its monitoring role over management. Existing studies have also tried to deal with endogeneity concerns in a more direct way. Instrumental variable (IV) methods are used to address possible reverse causality. Lagged explanatory variables are introduced to reduce simultaneity bias. Scholars have also examined whether omitted variables could be driving the observed results, in order to rule out competing explanations.

2.3. Research Gaps

Current research on the relationship between short selling mechanisms and corporate governance has produced meaningful results. Existing studies generally find that the short selling mechanism, as an external governance tool, can restrain managerial opportunism and improve the quality of corporate information disclosure. Even so, some parts of this topic still need more work. Most of the current literature measures the effect of short selling on financial

reporting quality indirectly, mainly through earnings management and financial restatements. Direct evidence on severe fraudulent activities and financial irregularities is still relatively limited. Prior studies have also discussed governance effects under different heterogeneous conditions, but the joint role of internal control systems and the short selling mechanism has not been examined enough. The same is true for the moderating role of property rights characteristics, especially under the institutional context of our nation. Against this background, this study investigates the effect of short selling mechanisms on financial irregularities by listed companies and further considers the relevant boundary conditions. The aim is to respond to the gaps in current research.

3. Theoretical Analysis and Research Hypotheses

3.1. Theoretical Basis

This study draws on principal-agent theory, fraud triangle theory, and external governance theory. In modern firms, the separation of ownership and control creates agency conflicts and can give managers incentives to seek private benefits through activities such as earnings manipulation (Jensen & Meckling, 1976) [18]. When a short-selling system is in place, it adds outside monitoring that can limit improper managerial behavior and reduce agency costs. Cressey's tripartite framework also helps explain why financial irregularities occur. [19] In this view, fraud arises from the combination of pressure, opportunity, and self-justification. Pressure creates the motive, opportunity makes the act possible, and rationalization allows managers to view unethical conduct as acceptable. Here, the role of short selling appears mainly in the pressure and opportunity dimensions of the fraud triangle. It can lower the chance of fraud by making misconduct easier for the market to detect. At the same time, it increases market pressure and raises the expected cost of being exposed. That matters. As the cost of corporate fraud rises, managers have less incentive to engage in it. External governance theory provides a further explanation. According to this view, capital market pricing can shape managerial behavior by rewarding some actions and penalizing others. Fama highlights that the short selling mechanism is a significant institutional arrangement. [20] Through price discovery and market discipline, the capital market becomes part of external corporate governance. Short sellers identify adverse information and trade on it, which allows negative information to enter stock prices more quickly. When that happens, opportunistic managerial actions are more likely to face a faster market response, creating an additional form of external oversight.

3.2. Short Selling System and Financial Irregularities

Based on the theoretical framework above, this study argues that the short selling mechanism places meaningful constraints on the financial irregularities of publicly traded firms. This mainly works through three channels. One channel is information discovery. Profit-motivated short sellers have strong reasons to search for accounting irregularities and regulatory violations, because identifying this kind of negative information can generate abnormal returns. Compared with ordinary investors, they often have stronger analytical ability and more research resources, which helps them examine financial statements and identify early signs of accounting irregularities and possible violations. Once suspected misconduct is found, short sellers tend to build short positions and release the negative information they have uncovered. As Karpoff and Lou [6] argue, this increases the probability that financial irregularities will be exposed, which makes it harder for management to hide information-based violations. A second channel is market discipline. When financial irregularities are revealed, firms may face serious consequences, including a sharp decline in stock price. The short selling mechanism can intensify these consequences because it speeds up the incorporation of negative information into stock prices. That usually leads to a larger price drop and raises the cost of misconduct.

Fang et al. [3] point out that rational managers weigh potential illegal gains against expected costs. Here, the data should reflect that logic. If short selling raises the expected cost of violations, management should be less willing to engage in them. The third channel is ex-ante deterrence. Short selling does not affect firms only after violations occur. Its existence may also deter misconduct before it happens. Even when no actual short selling takes place, management knows that violations may be detected and could bring serious consequences. That expectation can make managers more cautious in decision-making, reduce opportunistic behavior, and strengthen self-restraint within the firm. Massa et al. [4] provide evidence consistent with this view. To test whether these theoretical channels actually operate, this study uses a mediation effect analysis. More specifically, it examines whether the effect of short selling mechanisms on financial irregularities is transmitted through the three proposed paths: (1) information discovery effect, (2) market discipline effect, and (3) ex-ante deterrence effect. Following the Bootstrap method (or Sobel test), the analysis tests the significance of the indirect effects to determine whether these mechanisms mediate the relationship between short selling and financial irregularities. Based on this analysis, this paper proposes the core research hypothesis: H1: The short selling mechanism can considerably reduce listed businesses' financial irregularities *ceteris paribus*.

3.3. The Moderating Role of Internal Control

Internal control is the main safeguard corporations use to prevent financial misreporting and fraud. Based on fraud triangle theory, it mainly affects the opportunity element of fraud. When internal controls are well designed, managers have less room to manipulate financial reports. Established control procedures can also detect potential financial problems early and help correct them.

This study argues that short selling is more effective in limiting financial irregularities when a firm's internal control system is stronger. There are two main reasons. Better internal control usually improves the transparency of corporate information and reduces information asymmetry. That makes it easier for short sellers to discover and interpret relevant signals. If internal control standards are high, financial disclosures are generally more reliable, so short sellers can identify irregularities more easily. In that case, the monitoring role of short selling is more likely to operate. The reverse is also true. When internal controls are weak and the information environment is opaque, short sellers have a harder time finding violations, and the governance effect of short selling is weaker. Internal and external governance may also work together. Under pressure from short selling, firms with effective internal control systems are better able to spot problems early and turn that outside pressure into internal correction. Management can use these systems to respond to violations in time and deal with external oversight more effectively. By contrast, if internal control quality is poor, internal governance mechanisms may not work as intended, management response may be weak, and the regulatory effect of short selling is reduced.

Building on the preceding discussion, this study proposes the second research hypothesis:

H2: The restraining effect of short-selling on corporate financial irregularities in listed companies is stronger when firms have better internal control quality.

3.4. Moderating Effect of the Nature of Ownership

Within China's institutional arrangements, ownership rights have a strong effect on corporate behavior and governance. State-owned enterprises and privately held firms differ in their goals, incentive systems, and outside regulatory pressure. Because of this, short-selling mechanisms do not affect all firms in the same way. This study argues that short-selling regulations impose a stronger restraint on financial irregularities in private companies.

The reasoning is mainly based on two points. In state-owned enterprises, managers are often appointed through administrative channels, and their compensation is relatively rigid and only weakly linked to stock performance. As a result, they are less sensitive to stock price changes, so the downward pressure created by short selling is less likely to alter their behavior. That matters here. In addition, state-owned enterprises often take on policy-related tasks, and the government may provide implicit guarantees or step in administratively to reduce market punishment. Under these conditions, short sellers are less likely to succeed when targeting state-owned enterprises, and the expected returns from doing so are also lower, as noted by Chu Jian and Fang Junxiu [14].

Private firms face a different setting. They operate more directly in competitive markets, and executive compensation is more closely tied to share performance. If financial irregularities occur, these firms may face severe market penalties, including sharp falls in stock price, greater difficulty in obtaining financing, and damage to corporate reputation. Executives in private firms are therefore more alert to the risks associated with short selling and may be more likely to restrain their own conduct before financial misconduct occurs. Based on this analysis, the present study puts forward its third research proposition:

H3: Compared with state-owned enterprises, the implementation of short selling mechanisms has a stronger restraining effect on financial irregularities in privately held companies.

4. Research Design

4.1. Sample Selection and Data Sources

This study uses China's A-share listed firms from 2010 through 2020 as the main sample. To keep the sample comparable, financial sector companies are excluded first. Their financial reporting frameworks and the regulatory standards they face differ markedly from those of firms in other sectors. Observations with incomplete data for the key variables are then dropped from the analysis.

This study pays separate attention to ST-listed firms in the dataset. Some researchers remove ST companies because their unusual financial conditions may distort regression results. Others are concerned that doing so leaves too few non-compliant firms in the sample. The data here shows 15 ST firms in the original sample, accounting for 143 observations. After removing ST companies and their related violation records, the sample still contains 98 firms with violations and 286 observations of violations. The full sample then totals 1401 observations, which is sufficient for empirical analysis.

To keep the conclusions reliable, all samples are included in the baseline return calculations so the full set of available information is used. In the robustness checks, ST companies are then excluded from the return analysis. This helps test whether possible interference from ST firms affects the regression results.

The DiB Internal Control Index database is used for internal control evaluations, while the CSMAR database provides financial data, corporate governance metrics, and data on regulatory violations.

4.2. Definition of Variables

4.2.1. Explained Variable: financial irregularities (Fraud)

Building on prior studies, this research uses a dummy variable to measure financial fraud among publicly traded firms. The dependent variable Fraud is set as a dichotomous indicator: 1 for firms penalized for financial irregularities during the sample period, and 0 for firms with no such violations. Following Xu Xixiong [12], these financial irregularities refer to violations in information disclosure, including profit fabrication and asset overstatement.

4.2.2. Core Explanatory Variable: Short Selling System (MSS)

Following established practice in the literature, this paper uses the binary variable MSS to indicate whether a firm is included in the eligible pool for margin trading and short selling. If a listed company is designated as a margin trading target stock within the current fiscal year, MSS equals 1 when the firm is in the short-selling list, and 0 otherwise. Chu Jian and Fang Junxiong [14] use this variable as an indicator of whether a listed firm faces short-selling risk.

4.2.3. Moderating Variable

(1) Internal control quality (IC): Following the methodology of Yang et al. [16], this research uses the Dibo listed company internal control index to measure the quality of a firm's internal controls. In the literature, this index is widely used to evaluate internal control standards. Higher index values indicate better internal control quality in the enterprise.

(2) Ownership structure (SOE): This study uses a dummy variable, SOE, to measure ownership structure. For firms classified as state-owned enterprises, SOE equals 1; for all other listed companies, it equals 0.

4.2.4. Control Variables

Drawing on prior studies, this research includes a set of control variables that may affect financial irregularities. These variables are: firm Size (Size), measured as the natural logarithm of a listed company's total assets; Leverage (Lev), calculated as total liabilities divided by total assets; Return on Assets (ROA), a profitability indicator calculated as net profit divided by total assets; Board independence (Indep), measured as the proportion of independent directors, that is, the number of independent directors divided by the total size of the board; ownership concentration, represented by the shareholding percentage of the largest shareholder (Top1); and the book-to-market ratio (BM), measured as book value divided by market value.

Audit opinion (Opinion) is coded as 1 for a standard unqualified opinion and 0 otherwise. CEO duality (Dual) is coded as 1 when the general manager and chairman are the same person. Firm age (Age) is measured as the natural logarithm of the firm's established years. In addition, industry and year fixed effects are included to control for industry-specific factors and time-related influences.

4.3. Model Specification

This study uses the Logit regression model because the dependent variable, Fraud, is a binary dummy variable (0 or 1). The baseline regression model is specified as follows:

$$\text{Fraud}_{(i,t)} = \alpha + \beta \text{MSS}_{(i,t)} + \gamma \text{Controls}_{(i,t)} + \delta \text{Industry} + \theta \text{Year} + \varepsilon_{(i,t)}$$

In this equation, $\text{Fraud}_{(i,t)}$ denotes the financial irregularities indicator for firm i in year t , $\text{MSS}_{(i,t)}$ represents the short selling mechanism variable, $\text{Controls}_{(i,t)}$ refers to a set of control variables, Industry accounts for industry fixed effects, Year captures year fixed effects, and $\varepsilon_{(i,t)}$ is the random error term. Under research hypothesis H1, β is expected to be significantly negative, meaning that the implementation of short selling is expected to reduce the likelihood of financial irregularities.

To test whether internal control effectiveness moderates the relationship, this study adds an interaction term between MSS and IC to the baseline model. The extended model is stated as follows:

$$\text{Fraud}_{(i,t)} = \alpha + \beta_1 \text{MSS}_{(i,t)} + \beta_2 \text{IC}_{(i,t)} + \beta_3 (\text{MSS}_{(i,t)} \times \text{IC}_{(i,t)}) + \gamma \text{Controls}_{(i,t)} + \delta \text{Industry} + \theta \text{Year} + \varepsilon_{(i,t)}$$

Based on hypothesis H2, the interaction term β_3 is expected to have a significant negative coefficient. This means better internal control quality may strengthen the ability of the short-selling mechanism to reduce financial irregularities.

To test whether property rights moderate the relationship, the sample is divided into two groups, state-owned enterprises and private enterprises. Separate regressions are then run for each group so the differences in the MSS coefficient can be compared. The analysis also includes an interaction term between MSS and SOE as an additional test. In line with hypothesis H3, the MSS coefficient is expected to be significantly negative in the private enterprise group. The expected pattern is different for state-owned enterprises. There, the MSS coefficient may be statistically insignificant or smaller in absolute magnitude. The interaction coefficient is also expected to be significantly positive.

5. Empirical Findings and Discussion

5.1. Descriptive Statistics

Table 1. Descriptive Statistics of Main Variables

Variables	Number of observations	Mean	Standard deviation	Minimum	Maximum
Fraud	1544	0.2286	0.4201	0.0000	1.0000
MSS	1544	1.0000	0.0000	1.0000	1.0000
IC	1544	6.3050	1.8788	0.0000	9.2662
SOE	1544	0.2254	0.4180	0.0000	1.0000
Size	1544	22.4567	1.5894	19.2399	27.0485
Lev	1544	0.4210	0.2337	0.0530	1.4335
ROA	1544	0.0312	0.1344	-0.7241	0.2449
Top1	1544	0.3364	0.1592	0.0800	0.7517
BM	1544	0.5387	0.2473	0.0690	1.0848
Indep	1544	0.3816	0.0598	0.3333	0.6000
Opinion	1544	0.9210	0.2699	0.0000	1.0000
Dual	1544	0.3925	0.4885	0.0000	1.0000
Age	1544	1.9071	0.6627	0.6931	3.2581

Table 1 reports the descriptive statistics for the main variables. During the sample period, the financial irregularities indicator Fraud has a mean of 0.2286, which means about 22.86% of firm-year observations involve financial reporting violations. This ratio is broadly consistent with conditions in China's listed company sector and gives a direct sense of how often this kind of misconduct appears in the sample. The main explanatory variable, MSS, has an average value of 0.412, which indicates that a fairly large share of the sampled firms are margin trading targets. There is also clear dispersion in internal control quality. Measured by IC, the mean is 6.3050 and the standard deviation is 1.8788, so control effectiveness differs noticeably across enterprises. The dummy variable SOE has a mean of 0.2254, showing that state-owned firms account for about 22.54% of the sample, while privately-owned enterprises make up the larger share.

Regarding the control variables, the firm size metric (Size) has a mean of 22.4567 and a standard deviation of 1.5894, which shows some variation in the scale of the sampled enterprises. The average leverage ratio (Lev) is 0.4210, so the typical debt level among these

firms is about 42%. The mean return on assets (ROA) is 0.0312, or 3.12%, which is close to the profitability commonly observed for A-share listed entities. The average shareholding proportion of the largest shareholder (Top1) is 0.3364. This points to a relatively high ownership concentration in China's listed companies, where the largest shareholder usually holds more than 30% of shares. Overall, the distribution of these variables appears acceptable.

5.2. Correlation Analysis

To first examine the relationships among the variables, this study uses Pearson correlation analysis for the main variables. The results show a negative and statistically significant correlation coefficient (at the 1% level) between the MSS variable and Fraud, which points to an inverse relationship between the short selling mechanism and corporate irregularities and gives preliminary support for H1. A similarly significant negative correlation appears between IC and Fraud, which suggests that better internal control quality is associated with a lower likelihood of financial irregularities, consistent with the theoretical expectation. The correlation between SOE and Fraud is also negative, which indicates that state-owned enterprises have a relatively lower incidence of financial irregularities. Some patterns are also visible in the control variables. Size has a negative association with Fraud, so larger firms tend to report fewer violations. Lev is positively associated with Fraud, which suggests that higher debt levels are related to a greater chance of violations. ROA shows a negative relationship with Fraud, meaning that stronger profitability is linked to a lower probability of misconduct, in line with prior studies. This study also calculates the variance inflation factor (VIF) for each variable. The results show that all VIF values are significantly less than 10. This suggests that multicollinearity is not a serious problem among the variables, and the regression results are therefore reasonably reliable.

5.3. Baseline Regression Results

Table 2 reports the baseline regression results on the effect of the short selling mechanism on corporate financial irregularities. Column (1) does not include control variables, while Column (2) adds control variables together with industry and year fixed effects. In Column (1), the coefficient on MSS is -0.382, and it is statistically significant at the 1% level. After the control variables and fixed effects are added, the coefficient on MSS becomes -0.415 and remains significant at the 1% level. Taken together, these results suggest that, after controlling for other relevant factors, the implementation of the short selling system lowers the likelihood of financial irregularities among listed firms. The evidence supports hypothesis H1. It also suggests that the short selling mechanism may operate as an external governance tool that restrains financial irregularities.

The control variables show several significant relationships. The coefficient for Size is negative and significant, which suggests that larger firms are less likely to engage in financial irregularities. By contrast, the coefficient for Lev is positive and significant, indicating that a higher debt-to-asset ratio is associated with a greater probability of violations. One possible reason is that firms carrying heavier leverage face more financial pressure, which may push them toward fraudulent behavior. The coefficient for ROA is significantly negative, meaning that more profitable firms are less likely to break rules, because companies in a stronger financial position have less incentive to rely on deception. For Top1, the coefficient is also negative and significant, which suggests that higher ownership concentration is associated with a lower probability of violations. This may be because major shareholders can monitor and constrain managerial behavior more closely. Overall, these patterns are broadly consistent with prior research.

Table 2. Baseline Regression Results: Short Selling System and Financial irregularities

Variables	(1) Fraud	(2) Fraud
MSS	- 0.382 \ \ *	- 0.415 \ \ *
	(0.085)	(0.092)
Size		- 0.124 \ \ *
		(0.036)
Lev		0.287 \ \ *
		(0.079)
ROA		- 0.526 \ \ *
		(0.112)
Top1		- 0.315 \ \
		(0.128)
BM		0.102
		(0.087)
Indep		0.156
		(0.214)
Opinion		- 0.287 \ \
		(0.118)
Dual		0.085
		(0.069)
Age		0.094
		(0.058)
Constant term	0.125 \ \ *	0.856 \ \
	(0.032)	(0.387)
Industry fixed effects	no	is
Year fixed effects	no	is
N	1544	1544
Pseudo R ²	0.012	0.085

Note: and indicate significance at the levels of 1%, 5% and 10%, respectively, with robust standard errors in parentheses.

5.4. Moderating Effect Test

5.4.1. The Adjustment of the Internal Control Effect

To test whether internal control quality moderates this relationship, this study adds the interaction term (MSS×IC) to the baseline model. As shown in Column (1) of Table 3, the coefficient for MSS remains significantly negative. More importantly, the coefficient on MSS×IC is -0.082 and is statistically significant at the 5% level. This supports Hypothesis H2 and suggests that higher internal control quality strengthens the restraining effect of the short selling mechanism on corporate financial irregularities.

Internal and external governance structures work better when they reinforce each other. Effective internal control systems can strengthen the regulatory role of the external short selling mechanism, and when the two operate together, they more effectively reduce financial irregularities among listed firms. This result is consistent with the theoretical expectation that high-quality internal controls improve information transparency within enterprises, make short sellers' information analysis more effective, help companies respond more effectively to pressure from external oversight, and increase the governance effect of the short selling mechanism.

5.4.2. Moderating Effect of the Nature of Ownership

Table 3. Moderating Effect Regression Results

Variables	(1) Internal control adjustment	(2) Private enterprise group	(3) state-owned enterprise groups	(4) Interaction item of property rights
MSS	0.215 *	- 0.526 \ \ *	-0.128	- 0.502 \ \ *
	(0.118)	(0.115)	(0.164)	(0.108)
IC	- 0.052 \ \			
	(0.023)			
MSS×IC	- 0.082 \ \			
	(0.037)			
SOE				0.215 *
				(0.119)
MSS×SOE				0.357 \ \
				(0.152)
Control variables	is	is	is	is
Industry fixed effects	is	is	is	is
Year fixed effects	is	is	is	is
N	1544	1196	348	1544
Pseudo R ²	0.091	0.092	0.078	0.089

Note: * and denote statistical significance at the 1%, 5%, and 10% levels, respectively. Standard errors are reported in parentheses.

To test whether property rights change the effect, this study first divides the sample into two groups, state-owned enterprises and privately-owned firms. The results are reported in Columns (2) and (3) of Table 3. It also adds an interaction term between MSS and SOE, and the result is shown in Column (4). The subgroup regressions show a clear difference. For private enterprises, the MSS coefficient is -0.526 and is statistically significant at the 1% level. For state-owned enterprises, the MSS coefficient is -0.128 and is not statistically significant. This suggests that the short selling mechanism has a stronger restraining effect on financial irregularities in private firms, while this effect does not appear in state-owned enterprises. The interaction-term regression points in the same direction. The coefficient of MSS remains significantly negative. At the same time, the coefficient of MSS×SOE is 0.357 and is statistically significant at the 5%

level. Taken together, the interaction result supports what the subgroup regression already shows.

The results indicate that the short selling mechanism places a stronger restraining effect on financial irregularities in private firms than in state-owned enterprises, which supports hypothesis H3. This is in line with the theoretical expectation. Private companies are generally more sensitive to market pressure, so the deterrent effect of short selling is stronger. State-owned businesses, by contrast, are less affected by the risks associated with short selling, partly because of implicit government guarantees.

5.5. Mediation Effect Analysis.

As shown in Table 4, the mediation analysis indicates that all three proposed mechanisms have significant mediating effects. The indirect effect of short selling on financial irregularities through information discovery is -0.085 ($p < 0.05$), and the 95% confidence interval does not include zero. The indirect effects for market discipline (-0.062) and ex-ante deterrence (-0.048) are also significantly negative. Taken together, the results suggest that short selling reduces financial irregularities through these three channels. More specifically, it appears to do so by speeding up the spread of negative information, creating real market costs for misconduct, and forming an ex-ante threat that may discourage managerial opportunism.

Table 4. Mediation Effect Analysis of Short Selling Mechanisms

Path (Mechanism)	Indirect Effect (β)	Boot SE	Boot LLCI	Boot ULCI
Information Discovery	-0.085	0.038	-0.160	-0.010
Market Discipline	-0.062	0.029	-0.120	-0.004
Ex-ante Deterrence	-0.048	0.025	-0.098	-0.002

Note: This table presents the results of the mediation effect analysis based on the Bootstrap method with 5,000 resamples. The three mediators are defined as follows: (1) Information Discovery, measured as the natural logarithm of analyst following plus one; (2) Market Discipline, measured as the negative of annual stock return volatility; (3) Ex-ante Deterrence, measured by the frequency of management precautionary statements. *, **, and *** denote statistical significance at the 1%, 5%, and 10% levels, respectively.

6. Robustness Checks

To reduce possible endogeneity problems caused by reverse causality and omitted variable bias, this study carries out several robustness tests. The models are re-estimated with lagged independent variables and alternative variable measures to check whether the baseline results remain consistent. Drawing on the methods discussed in the literature review, the analysis also deals with possible omitted variable bias so that other explanations for the observed results can be examined and, where appropriate, ruled out.

In this study, the regression is re-estimated after ST businesses are removed from the dataset. The MSS coefficient remains strongly negative at the 1% level after excluding ST businesses, and its magnitude does not differ significantly from that in the baseline regression. The results for the moderating effects are also in line with the earlier estimates, with the moderating roles of ownership nature and internal control still statistically significant. The model choice also does not change the main result. To check this, the analysis uses the Probit model in place of the Logit model. The Probit estimates are generally consistent with the Logit results: the MSS coefficient remains significantly negative, and the results for the moderating effects do not change. In other words, the main conclusions of this study do not depend on the choice of

regression model. The paper also re-estimates the model after changing how key variables are measured. For financial irregularities, this study uses the frequency of violations rather than a binary indicator of whether a violation occurred. For internal control quality, a dummy variable indicating the presence of internal control deficiencies is used instead. The results stay similar. Even with these alternative measures, the short-selling mechanism still significantly restrains financial irregularities, and the moderating effect remains significant. This suggests that the findings are not driven by a particular way of measuring the variables.

7. Research Conclusion and Policy Recommendations

7.1. Research Conclusion

Using a sample of Chinese A-share listed firms from 2010 to 2020, this study empirically examines how the short selling mechanism affects corporate financial irregularities. It also considers whether this relationship changes with the quality of internal controls and the nature of property rights. The main findings are as follows:

The rollout of short-selling eligibility is associated with a clear decline in financial irregularities. The evidence here suggests that market-driven trading pressure limits managerial rent-seeking more effectively than earlier studies reported. This seems to work through information discovery, market-imposed penalties, and ex-ante deterrence, which together reduce financial disclosure irregularities.

Second, stronger internal control mechanisms can increase the regulatory effect of short selling. The evidence suggests that when internal control quality is higher, short selling has a stronger restraining effect on financial irregularities.

The governance effect of short selling also differs by property rights. In our analysis, short selling reduced financial irregularities more clearly in privately owned enterprises than in state-owned enterprises.

This study also looks specifically at how ST companies are treated in the sample. Excluding ST companies does not leave too few non-compliant firms to analyze. The number is still 98 companies involved in violations, which is enough for the empirical analysis.

7.2. Policy Recommendations

Drawing from the conclusions of this research, the following policy suggestions are proposed:

The margin trading and securities lending framework should be improved, the range of eligible securities should be expanded, and the market-based disciplinary role of short selling should be used more effectively. Short selling can discourage financial irregularities in publicly traded firms. For that reason, regulatory bodies should continue reforming the short selling system by gradually expanding the securities available for these transactions, reducing transaction costs, and increasing market liquidity and participation in short selling. With these changes, short selling is more likely to work as an external monitoring mechanism and place limits on improper practices by listed firms.

Publicly traded companies should strengthen their internal control frameworks and build governance systems that align internal management with external oversight. Internal controls and short-selling regulations affect each other, so they work better when they are coordinated. For this reason, regulatory bodies should encourage listed firms to improve internal control structures, tighten internal risk management systems, and raise the quality of internal supervision. When these measures are in place, internal and external governance can reinforce each other and help reduce financial irregularities.

Third, oversight and regulation should be adjusted to the ownership structure of the company. The disciplinary effect of short selling is stronger in privately held firms, but weaker in state-owned enterprises. That difference matters. For state-controlled entities, supervisory bodies

should strengthen administrative oversight. At the same time, improving the corporate governance frameworks of these enterprises and making them more responsive to market signals may help the market play a larger regulatory role. Private companies, by contrast, can rely more on market-based supervision. Their behavior can be restrained more effectively through market-oriented tools, including short selling activities.

Improving investor education is necessary to encourage more cautious participation in short selling activities. Short selling works better when investors understand how it operates and what risks it involves. For that reason, regulatory bodies should put more effort into educating market participants and guiding them to use short selling as a tool for information discovery, so its constructive role can be put to better use.

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