

The Impact of China's Short Selling System Regarding The Regulation of Connected Party Dealings of Companies

Zhangxinzhi Cai^a

School of Commercial, University of International Business and Economics, Beijing, 100029, China

^aczxz_2023@qq.com

Abstract

The fairness of connected party dealings is a core issue for the sound functioning of the capital market. Short selling system still needs to be further verified for its constraining effect on related party transactions. This paper selects Chinese A-share listed firms spanning 2010 to 2023 as the research sample, expands margin trading and securities lending system as a quasi natural experiment, and uses a difference in differences (DID) framework to assess the governance effectiveness of the short selling system on listed firms. The research results demonstrate that the short selling mechanism can significantly suppress the scale of unfair related party transactions of listed companies, and this governance effect is more prominent in enterprises with low information transparency and weak corporate governance level; Mechanism testing further confirms that the short selling system mainly achieves effective constraints on unfair related party transactions through two paths: increasing external supervision pressure and reducing agency costs. This article not only augments the the research findings regarding the economic impacts of the short selling mechanism and the regulation of connected party transactions, but also provides experience reference and policy inspiration for regulatory authorities to optimize short selling mechanism design, and regulate trading behavior of listed firms.

Keywords

Short Selling System; Related Party Transactions; Double Difference; Intermediary Effect; Corporate Governance.

1. Introduction

If there is a lack of regulation and transparency in related party transactions, it is easy for them to evolve from normal commercial behavior to a means of infringing on the interests of all parties. In July 2025, China Securities Regulatory Commission (CSRC) officially issued a guideline, further enhancing the supervision of connected party transactions and improving the board of directors' requirements for identifying and reviewing related party transactions; Strengthen the regulation of behaviors that may harm the interests of listed companies, such as inter industry competition and related party transactions, targeting controlling shareholders and actual controllers. However, traditional internal governance and administrative supervision suffer from lag and high costs. The short selling mechanism provides a powerful driving force for negative information mining and price discovery in the market, and theoretically can effectively deter companies from engaging in illegal related party transactions. Foreign research has shown that relaxing regulations on short selling or introducing short selling mechanisms can effectively curb earnings management of listed companies, and mitigate the risk of stock price collapse. Since 2010, domestic research has gradually followed suit, and most conclusions support that the short selling mechanism exerts a positive impact on

corporate governance. Regarding the influencing factors and governance of related party transactions, domestic and foreign literature extensively explores the causes and economic consequences of related party transactions. Research has shown that factors such as equity concentration, board characteristics, legal system environment, and audit quality are all important factors affecting the fairness of connected party transactions. In terms of governance, existing research often proposes countermeasures from the perspectives of strengthening internal checks and balances, enhancing external auditing, and judicial remedies. There is relatively little research directly linking the short selling mechanism with the governance of related party transactions, which is the direction that this study intends to break through. This study will systematically evaluate the influence of the expansion process of China's margin trading and securities lending regime on connected party transactions of the target listed companies. The research aims to confirm the firm governance effectiveness of the shorting mechanism, provide solid empirical evidence and policy implications for regulatory authorities to further optimize the short selling mechanism and build a composite governance system of "government market" coordination, thereby improving the overall governance efficiency and resource allocation efficiency of China's capital market.

2. Literature Review and Research Hypotheses

2.1. Literature Review on Related Party Transactions

Domestic and foreign research generally believes that related party transactions are a double-edged sword. Early research abroad was mostly grounded in agency theory and the "tunneling effect" theory, emphasizing controlling shareholders possess the motivation and ability to embezzle listed firms via inequitable connected party transactions, which harms the benefits of middle and little shareholders[1,2]. Chinese scholars found substantial proof of earnings manipulation and benefit transfer via connected party transactions in Chinese listed companies[3]. In terms of governance, research focuses on the constraining effects of internal and external mechanisms[4]. Domestic literature closely combined with the Chinese institutional background confirms that under the governance structure of concentrated equity and "one dominant shareholder", the problem of interest transmission in related party transactions is particularly prominent[5]. Scholars generally believe that although laws and regulations such as the Company Law and the Securities Law continue to improve, traditional internal governance and administrative supervision alone are difficult to completely curb their drawbacks, and there is an urgent need to introduce more market-oriented governance tools. Current studies have profoundly revealed the causes and harms of connected party transactions, and emphasized the limitations of relying solely on internal governance and institutional constraints. This provides theoretical necessity and practical urgency for introducing market-oriented external governance systems such as shorting mechanisms.

2.2. Literature Review on Short Selling Mechanism

The regulatory impact of shorting mechanism has been a research hotspot in the field of corporate finance in the past decade, and its core lies in the "supervision hypothesis". Mature markets provide strong support for the exploration of the regulatory impact of shorting mechanism. A wealth of studies have demonstrated that relaxing shorting regulations or increasing short selling pressure can effectively curb earnings management of listed companies, enhance the caliber of information disclosure, and reduce the hazard of stock price crash[6-8]. Its mechanism of action lies in the willingness and ability of short sellers to mine and trade negative information, thereby forming a pre-emptive deterrence and post-emptive punishment against opportunistic behavior of management. Since the official rollout of China's margin trading and securities lending system in 2010, domestic pundits have conducted extensive tests around the Chinese context. Most studies have confirmed the positive corporate governance

effects of shorting mechanism. One research demonstrated that shorting through securities lending significantly reduced the probability of the target company violating regulations; another research demonstrated that shorting mechanisms constrain the "tunneling behavior" of controlling shareholders [9,10]. These studies provide preliminary evidence for understanding the role of shorting mechanism in China's emerging and transitioning markets. There is a basic consensus in domestic and foreign research that the shorting mechanism can act as an effective market-oriented external governance tool, which can constrain the improper behavior of internal personnel through information mining and price discovery functions.

2.3. Short Selling Mechanism and Governance of Related Party Transactions

The research that directly links the shorting mechanism with the governance of related party transactions is in its infancy and is the core of this study's intention to explore in depth. Recently, international research has begun to focus on this specific channel. For example, a study found that companies facing short selling pressure are more inclined to divest inefficient related assets to alleviate external supervision pressure [11]. This indicates that the short selling mechanism can directly affect the company's related party trading decisions. Scholars in China have also started related explorations. A study discovered that the shorting mechanism reduces the negative response of the capital market to related party transaction announcements, implying that the market believes that the existence of short sellers can better supervise such transactions, thereby reducing their information asymmetry and negative expectations [12]. However, these studies are mostly indirect evidence or only focus on one aspect.

The existing research provides a solid theoretical foundation and mature research methods for this topic, especially the idea of using Chinese short selling targets to expand in batches and construct quasi natural experiments, which provides a good path for causal identification. However, there are also some shortcomings: most studies center on the impact of shorting on the caliber of financial reports or overall agency costs, lacking systematic and targeted research on the specific behavior of connected party transactions; Current scholarship mostly centers on verifying the existence of the mean effect, and the black box of its channel of action is not fully opened. The mediating mechanism urgently needs empirical testing; The effectiveness of the short selling mechanism is likely to be heterogeneous due to elements including the attribute of corporate ownership and the degree of internal governance. Existing research has not explored these boundary conditions in depth, which is crucial for the accuracy of policy-making.

This research seeks to address the aforementioned gap by systematically empirically testing the governance effectiveness of short selling mechanism on related party transactions of Chinese listed companies, deeply analyzing its mechanism and contextual boundaries, and providing more accurate and in-depth theoretical basis and evidence support for regulatory practice. On this basis, this paper puts forward the core hypothesis:

H1: With other conditions held constant, the implementation of short selling system will significantly suppress the scale of unfair related party transactions of listed companies.

2.4. Heterogeneity Characteristics: Based on Corporate Governance and Information Transparency

(1) Corporate governance level: In companies with weaker governance levels, the power balance between controlling shareholders and management is insufficient, and the motivation for unfair related party transactions is stronger. As an external supervision mechanism, the short selling system can compensate for internal governance deficiencies and may have a more significant restraining effect on such companies.

(2) Information transparency: In companies with low information transparency, the fairness of related party transactions is more difficult for external investors to identify, and the risk of

interest transmission is higher. The information mining behavior of short sellers can reduce information asymmetry, and in this case, the suppression effect of the short selling system on unfair related party transactions may be more prominent. Based on this, a hypothesis is proposed:

H2: The inhibitory effect of the short selling system on unfair related party transactions is more significant in companies with weak corporate governance level;

H3: The inhibitory impact of shorting system on unfair related party transactions is more significant in enterprises with low information transparency.

2.5. Intermediary Mechanism: External Supervision Pressure and Agency Costs

The short selling system may affect related party transactions through two paths: one is to increase external supervision pressure, and the threat of short selling prompts external entities such as media and analysts to pay more attention to the company's related party transactions, increasing the probability of violations being exposed; The second is to reduce agency costs. The shorting mechanism constrains the self-interest behavior of management and controlling stockholders through stock price pressure, reducing agency conflicts. Based on this, a hypothesis is proposed:

H4: External supervisory pressure plays an intermediary role in the link between short selling system and unfair connected party transactions;

H5: Agency costs play an intermediary role in the link between short selling system and unfair connected party transactions.

3. Research Methodology

3.1. Data Collection and Preparation

This paper selects Chinese A-share listed firms from 2010 to 2023 as initial sample and filters it based on the following criteria: (1) excluding financial listed companies; (2) Exclude companies with abnormal financial conditions such as ST and * ST; (3) Remove samples with missing data. Finally, a "company year" observation value was obtained. Data source: The related party transaction data comes from the "Related Party Transaction Table" in the CSMAR database of Guotai'an. The list of financing and shorting targets are sourced from the official web portals of Shanghai Stock Exchange(SSE), Shenzhen Stock Exchange(SZSE) as well as CSMAR database. The corporate governance and financial data are all retrieved from CSMAR database, and the information transparency data is derived from the information disclosure assessment results of SZSE. Partial missing data is manually supplemented through the company's annual report.

3.2. Variable Measurement and Definition

(1)Dependent variable: scale of related party transactions

This article uses $\ln(\text{related party transaction amount}/\text{total assets})$ to measure the scale of related party transactions.

(2)Core explanatory variable: measurement of short selling

Firstly, in order to observe the changes in related party transactions of the target company before and after the securities lending pilot, this article constructs a difference-in-differences (DID) framework to define the explanatory variable did: if the company has been included in the securities lending list and the observation year is the year in which the company was included in the securities lending pilot or later, then the core explanatory variable did takes a value of 1, otherwise, it is assigned a value of 0.

(3)mediating variable

External supervision pressure (Media): The logarithm value of the number of media reports on the firm in that year is obtained from the CSMAR "Media Reporting Database";

Agency cost: measured by the management expense ratio: the higher the ratio of management expenses to operating income, the higher the agency cost.

(4)control variable

Referring to existing research, control for the following variables: firm size (Size), debt-to-asset ratio (Lev), profitability (ROA), equity concentration (Top1), independent director ratio (Indep), management shareholding ratio (Mshr), and company equity nature variable (SOE).

3.3. Model Construction

This article establishes a regression model to examine the influence of short selling system on the scale of connected party transactions of enterprises. The specific model settings are as follows:

$$Related_{it} = \beta_0 + \beta_1 did_{it} + X_{it} + \delta_i + \gamma_t + \varepsilon_{it} \quad (1)$$

The main variable explanations are presented in Table 1.

Table 1. Variable Definition

variable name	variable definition
Related	Please refer to the previous text for details
did	Please refer to the previous text for details
Size	Natural logarithm of total assets
Lev	The ratio of total liabilities to total assets
ROA	Net profit to total assets ratio
Top1	Shareholding ratio of the largest shareholder
Indep	The proportion of the number of outside directors to the total number of board members
Mshare	Management shareholding ratio
SOE	State owned enterprises take 1, otherwise it is 0

4. Empirical Analysis

4.1. Descriptive Analysis

Table 2 presents the descriptive statistics of the key variables in this paper. These statistical features are basically consistent with existing research on Chinese listed companies, which ensures the reliability of the data.

Table 2. Descriptive Statistics

Var	Obs	Mean	SD	Min	Median	Max
Related	42922	-2.234	1.906	-22.623	-1.801	11.141
did	42922	0.365	0.481	0.000	0.000	1.000
Size	42922	22.206	1.503	11.348	21.971	31.317
Lev	42922	0.455	0.936	-0.195	0.423	138.378
ROA	42922	0.030	0.676	-51.947	0.036	108.366
Top1	42922	0.335	0.151	0.003	0.310	0.900
Indep	42922	0.376	0.056	0.000	0.364	1.000
Mshare	42922	0.134	0.196	0.000	0.006	0.994
SOE	42922	0.333	0.471	0.000	0.000	1.000

4.2. Baseline Regression

Table 3 presents the benchmark regression findings for the short selling system on the scale of connected party transactions of listed companies. For the sake of rigor, we adopted a regression strategy that gradually incorporated control variables and fixed effects. Column (1) only includes the core explanatory variable *did*, and its coefficient is significantly negative at 1% level. Column (2) further incorporates control variables at the company level, and the *did* coefficient remains significantly negative with an increase in absolute value, suggesting that upon accounting for relevant factors, the restraining impact of the shorting system is more pronounced. Columns (3) and (4) respectively account for individual fixed effects, time fixed effects, and both simultaneously. The most rigorous column (4) regression results demonstrate that the *did* coefficient is -0.1761 and statistically significant at 1% level. It means that after controlling for a range of company characteristics as well as unobservable individual heterogeneity and time trends, on average, becoming a target of securities lending will result in a decrease of approximately 17.61% in the scale of connected party transactions (relative to total assets) of listed companies. This finding strongly supports the core hypothesis H1 of this article, which is that the implementation of the short selling system can significantly suppress the scale of related party transactions of listed companies, preliminarily verifying its effectiveness as an external governance mechanism.

Table 3. Benchmark Regression

	(1)	(2)	(3)	(4)
	Related	Related	Related	Related
<i>did</i>	-0.1190***	-0.4027***	-0.1572***	-0.1761***
	(0.0358)	(0.0366)	(0.0350)	(0.0348)
Size		0.0808***		0.0572*
		(0.0174)		(0.0315)
Lev		0.2626***		0.1380***
		(0.0732)		(0.0251)
ROA		0.0717*		0.0264
		(0.0423)		(0.0189)
Top1		0.1350		-0.0447
		(0.1378)		(0.1886)
Indep		-0.1251		-0.4135*
		(0.3097)		(0.2481)
Mshare		-1.9372***		-1.4105***
		(0.1161)		(0.1575)
SOE		0.1395***		0.0645
		(0.0487)		(0.0772)
Individual fixed effects	No	No	Yes	Yes
Fixed time effect	No	No	Yes	Yes
_cons	-2.1858***	-3.7848***	-2.1718***	-3.1607***
	(0.0261)	(0.3880)	(0.0128)	(0.7221)
N	42922	42922	42917	42917
adj. R2	0.0009	0.0764	0.5237	0.5312

4.3. Pre-trend Testing

This article draws on the event study method for pre-trend testing, which can be expressed as:

$$Related_{it} = \beta_0 + \sum_{-5}^1 \xi_t P_{it} + X_{it} + \delta_i + \gamma_t + \varepsilon_{it} \quad (2)$$

This article conducts a pre-trend test based on the year of policy implementation summarizes the data from 8 years before the policy was issued into -8 periods, and summarizes the data from 8 years after the policy was issued into 8 periods. The test results are shown in Figure 1, and the estimated coefficients for each period before policy implementation are not significant, which does not reject the hypothesis of parallel trends before implementation.

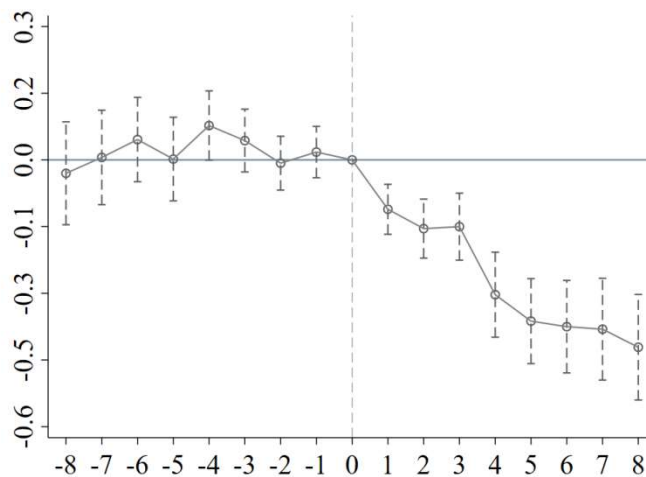


Figure 1. Pre Trend Test

Note: The hollow point represents the estimation coefficient of equation (2), and the short vertical line represents the 90% confidence interval corresponding to the standard error of clustering at the individual level.

4.4. Other Robustness Tests

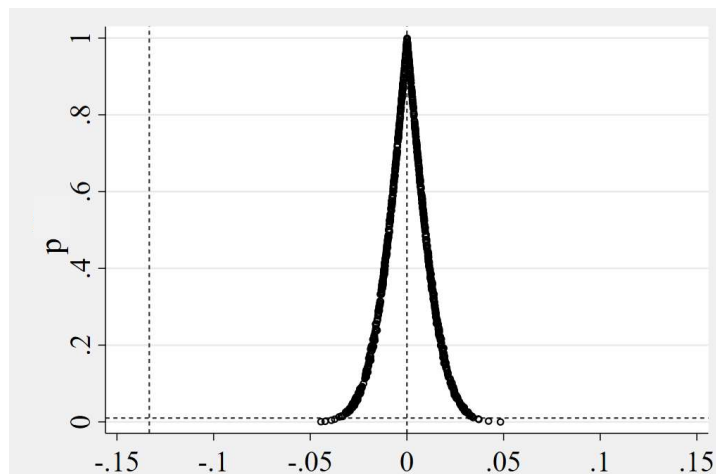


Figure 2. treatment group placebo test

Firstly, placebo test. To alleviate the bias caused by omitted variables on the results of this study, an indirect placebo test is adopted. Specifically, this paper randomly generates false estimates by randomly generating pseudo processed variables and repeating them 1000 times, resulting in 1000 instances. This variable theoretically does not affect the dependent variable. The results of pseudo regression are shown in Figure 2, both of which exhibit a normal distribution. The dashed line on the right side of the figure represents the estimated result of the baseline regression, located at the high tail position in the figure. This indicates that the estimation

results in this article are unlikely to be influenced by unobserved variables, providing stronger evidence support for the processing effects observed in the previous analysis.

Secondly, multidimensional fixed effects. On the basis of the benchmark model, we further incorporated industry fixed effects to control for the potential impact of industry level features that do not change over time on the results. As shown in Column (1) of Table 4, after controlling for industry, individual, and time fixed effects, the DID coefficient remains statistically significant and negative at the 1% level (coefficient=-0.1794).

Thirdly, change the sample interval. Considering the abnormal fluctuations in China's stock market in 2015, to avoid the special impact of extreme market conditions on related party trading behavior during this period, we excluded the sample data from 2015 and re conducted the regression. As presented in Column (2) of Table 4, the did coefficient remains significantly negative (coefficient=-0.1677), suggesting that the main conclusions of this study are not affected by the interference of samples from special periods.

Fourth, change the clustering criteria. In benchmark regression, the standard errors were clustered at the company level. Considering that related party transactions within the same industry may be related, we re estimated the standard errors by clustering them at the industry level. As presented in Column (3) of Table 4, the did coefficient remains significant at the 1% level (coefficient=-0.1761, with a slight increase in standard error), indicating that the conclusion is robust for different clustering assumptions.

Table 4. Multidimensional Fixed Effects, Changing Sample Intervals, and Changing Clustering Criteria

	(1)Multidimensional fixed effects	(2)Change sample interval	(3)Change clustering criteria
	Related	Related	Related
did	-0.1794***	-0.1677***	-0.1761***
	(0.0346)	(0.0353)	(0.0460)
N	42917	40310	42917
adj. R2	0.5324	0.5307	0.5312

5. Path Analysis

5.1. External Supervision Pressure

Firstly, this article examines whether the short selling system constrains related party trading behavior by increasing external supervisory pressure (hypothesis H4). Short sellers, driven by profit motives, have a strong drive to delve deeper and spread negative information about the company. This type of information mining behavior will generate significant externalities, attracting the attention of more market participants (such as financial media, analysts) and jointly forming a strong external supervision force.

Column (1) of Table 5 reports the regression results with external supervision pressure (Media, logarithm of media coverage) as the dependent variable. The coefficient of the core explanatory variable did is 0.0822, and it is significantly positive at the 1% level. This discovery has important economic implications: becoming a target company for securities lending significantly increases its media attention. This means that the introduction of the short selling system, as expected by theory, has indeed activated the market's information environment and directed more "searchlights" towards the target companies. As an important information intermediary and public supervisor, the increase in media attention significantly increases the exposure risk of corporate misconduct[13].

After verifying that the short selling system can increase media attention (i.e. path a is significant), we further examine the complete intermediary path. Column (2) of Table 5 shows

the findings following the inclusion of the mediator variable Media to the baseline model. The results show that, on the one hand, the mediator variable Media coefficient stands at -0.4155, which is significantly negative at 1% level, indicating that after controlling for other factors, the increase in media supervision pressure itself will lead to a reduction in the magnitude of connected party transactions (i.e., path b is significant). On the other hand, after introducing Media, the absolute value of the coefficient for the core explanatory variable did fell from -0.1761 in the baseline regression to -0.1239, but its significance level remained unchanged. This coefficient variation pattern conforms to the typical characteristics of mediation effects : the partial governance effect of the shorting system is absorbed by the media's attention to this channel. In other words, the short selling system suppresses related party transactions, partly because it leads to more intensive media supervision, thereby increasing the potential costs of related party transactions (especially the unfair part) and forcing management and controlling shareholders to restrain themselves[14].

In summary, the test results support hypothesis H4. The short selling system does not function in isolation, but through a transmission mechanism of "information mining → media attention → strengthened supervision", it enhances the company's information transparency and the probability of violations being exposed, thereby serving as a pre-event deterrent and post event constraint on potential profit transfer behaviors.

Table 5. Mechanism Inspection: External Supervision Pressure

	(1)	(2)
	External supervision pressure	Related
did	0.0822***	-0.1239***
	(0.0152)	(0.0347)
External supervision pressure		-0.4155***
		(0.0848)
N	41787	41787
adj. R2	0.8050	0.5497

5.2. Agency Cost

Secondly, this article examines whether the short selling system suppresses related party transactions by reducing agency costs for enterprises (hypothesis H5).

We use the Management Expense Rate (Mfee) as the inverse indicator of agency costs for testing. The greater the value of this indicator, the more severe the agency problems such as on-the-job consumption and slackness of management. The findings in Column (1) of Table 6 point to the fact that the parameter of did is -2.1752, which is significantly negative at 5% level. This clearly demonstrates that the introduction of the short selling system significantly reduces the management expense ratio of the target company, that is, the pressure of short selling effectively constrains the luxury on-the-job consumption and unnecessary expenses of the management, indicating that agency costs have been alleviated (path a is significant).

Subsequently, Column (2) of Table 6 presents the regression findings following the inclusion of the mediator variable Mfee. The parameter of Mfee is significantly positive at 10% level (parameter=0.0003), confirming a positive correlation between agency costs and the magnitude of connected party transactions. The more severe the agency problem, the more likely the company is to engage in more interest transfer related party transactions (path b is significant). Meanwhile, similar to the analysis of external supervision mechanisms, after controlling for Mfee, the absolute value of the coefficient of did decreased from -0.1761 to -0.1525, but remained significant. This result once again confirms the existence of some intermediary effects: a part of the governance impact of the shorting system is achieved by

suppressing the self-interest motivation of the management and reducing the overall agency conflict of the company. When agency costs decrease due to the pressure of shorting, the motivation for management and controlling shareholders to conduct "tunneling" via connected party transactions also weakens.

Therefore, assuming that H5 is empirically supported. The short selling system weakens the motivation to conduct inequitable connected party transactions from the source through the transmission path of "short selling threat → stock price pressure → constraint on management → reduction of agency costs", reflecting its positive role as an external governance mechanism in alleviating the second type of agency conflict.

Table 6. Mechanism Test: Agency Costs

	(1)	(2)
	Mfee	Related
did	-2.1752**	-0.1525***
	(0.8479)	(0.0349)
Mfee		0.0003*
		(0.0002)
N	42155	42155
adj. R2	0.3129	0.5301

6. Heterogeneity Analysis

The aforementioned benchmark regression and mechanism testing reveal the average governance effect and its path of action of the short selling system on related party transactions. However, the effectiveness of policies may vary significantly in different contexts, and identifying these differences is crucial for understanding the operational boundaries of short selling mechanisms and improving the accuracy of policy implementation. Therefore, this article further examines the heterogeneity of the governance effect of shorting system from two key dimensions: information transparency and corporate governance level. This not only helps to test theoretical hypotheses (H2 and H3), but also provides detailed empirical evidence for regulatory agencies to implement classified supervision and guide listed companies to improve internal governance.

6.1. Information Openness

The information environment serves as the foundation for the efficient functioning of market constraint mechanisms. According to the supervision hypothesis, short sellers, as active information miners in the market, their supervisory effectiveness is inevitably deeply influenced by the inherent information environment quality of the company. This article proposes hypothesis H3: The regulatory impact of shorting system is more prominent in companies with lower information transparency. The theoretical logic is that for companies with highly opaque information, the unfairness of their related party transactions is more difficult for external investors to detect, and the problem of information asymmetry is particularly serious. At this point, allowing short selling is equivalent to introducing a group of professional information detectives (short sellers) who possess the willingness and capability to uncover hidden negative information. This deep information mining behavior can generate huge marginal information increments, thereby forming a strong deterrent to insiders, so the expected governance effect should be more significant.

To test this hypothesis, we used the sum of absolute values of the firm's manipulative accruals during the last three-year period as a proxy variable for information opacity (an increase in the

value is associated with reduced information openness of the firm), and divided entire sample into the "high opacity group" and the "low opacity group" based on the median of this variable for group regression. Table 7 reports the corresponding estimation results. The empirical results strongly support the theoretical expectation of this article (hypothesis H3). Column (1) of Table 7 shows that in the sample group with high information opacity (i.e. low transparency), the coefficient of the short selling regime (did) is -0.1985, and it is highly significant at the 1% level. This indicates that for companies with poor information environments, introducing a short selling system can significantly decrease the magnitude of their connected party transactions. In contrast, column (2) shows that in the sample group with lower information opacity, the did coefficient is -0.0895, significant only at the 10% level, and its economic significance is much smaller than that of the low transparency group.

This result confirms the law of diminishing marginal effects in short selling supervision. In companies with high information transparency, their related party transactions themselves receive relatively sufficient market attention and supervision, and the additional supervision benefits that short sellers can bring from information mining are relatively limited. On the contrary, in companies with high information barriers and low transparency, conventional market supervision mechanisms are difficult to operate effectively, making it the "main battlefield" for professional supervisors such as short sellers to leverage their comparative advantages in information. The implementation of the shorting system can most effectively fill the supervision vacuum of such companies and have a strong constraint effect on potential profit transfer behavior, like sending charcoal in snow. This discovery has clear policy implications: when promoting short selling mechanisms, regulatory authorities can more targetedly include companies with poor information transparency and more serious potential agency problems in the scope of targets, thereby maximizing the marginal benefits of this external governance tool and accurately cracking down on improper related party transactions hidden behind opaque information.

Table 7. Information Transparency

	(1)Low information transparency	(2)High information transparency
	Related	Related
did	-0.1985***	-0.0895*
	(0.0460)	(0.0523)
N	28448	13978
adj. R2	0.5341	0.6035

6.2. Corporate Governance Level

The degree of corporate governance is a key factor that constrains the behavior of insiders. Based on hypothesis H2, we predict that the short selling system, as an external governance mechanism, can complement or replace internal governance mechanisms. Especially in companies with weak internal governance and a lack of shareholder checks and balances, the external market pressure brought by the short selling system should be able to more effectively compensate for the lack of internal supervision, thereby exerting stronger constraints on unfair related party transactions. We use the size of the board of directors (taking the natural logarithm of the number of directors plus one) as a proxy variable for the internal governance level of the company, and divide the sample into two groups based on the median: "high governance level" and "low governance level". The grouped regression results in Table 8 provide us with strong support.

The results clearly demonstrate a notable asymmetry in the governance effect of the shorting system. In column (2), in the subgroup with weaker corporate governance, the coefficient of did

is -0.1851, which is highly significant at the 1% level, indicating that the short selling system has a strong inhibitory effect on the related party trading behavior of such companies. In contrast, in column (1), for the group with higher levels of corporate governance, the did coefficient is -0.0886, which is not statistically significant.

This result strongly confirms hypothesis H2, that the governance effect of the shorting system is more pronounced in companies with deficient corporate governance. This is consistent the "substitution effect" hypothesis in corporate governance theory. For companies with sound internal governance mechanisms, internal supervision systems such as the board of directors and independent directors can effectively constrain related party transactions. Therefore, the marginal gain effect that external short selling mechanisms can play is relatively limited. However, for companies with internal governance disorder and prominent "one dominant shareholder" issues, the internal checks and balances mechanism is virtually non-existent, and the risk of unfair related party transactions is already higher. At this point, the introduction of the short selling system is like introducing an external "supervisor" who constantly pays attention to negative information about the company. Its potential short selling pressure directly increases the cost and risk of interest transmission between controlling shareholders and management, effectively filling the gap in internal governance. The conclusion of this study indicates that the shorting system performs a key governance function in the Chinese capital market, especially for listed companies with weak governance foundations and serious agency problems. Its value as an external supervision tool is particularly prominent. In the subsequent policy design, the regulatory authorities may consider more consciously including such companies in the scope of short selling targets to strengthen market constraints.

Table 8. Corporate Governance Level

	(1)High level of governance	(2)Low level of governance
	Related	Related
did	-0.0886	-0.1851***
	(0.0833)	(0.0387)
N	5732	36899
adj. R2	0.6149	0.5280

7. Conclusion and Policy Recommendations

This article uses the series of securities lending pilot programs, securities lending transfers, and refinancing implemented in China since 2010 as external shocks to construct a difference in differences model. It is found that the short selling system significantly suppresses unfair related party transactions of listed companies, verifying the external regulatory impact of the shorting mechanism; Findings from heterogeneity analysis reveal that this inhibitory effect is more prominent in companies with weak corporate governance and low information transparency, indicating that the short selling system can compensate for internal governance deficiencies; The intermediary mechanism test found that the short selling system reduces unfair related party transactions through two paths: increasing external supervision pressure and reducing agency costs, with the intermediary role of external supervision pressure being more significant.

Drawing on the findings of this paper, the following policy recommendations are proposed:

(1)Expand the scope of short selling targets, gradually include more small and medium-sized companies in margin trading targets, make the short selling mechanism cover a wider range of enterprises, and fully leverage its external supervision function;

(2) Improve the supporting system for short selling, strengthen the standardization of information disclosure for short sellers, encourage analysts, media and other entities to participate in supervision, and prevent malicious short selling behavior;

(3) Strengthen internal governance of the company, combine external constraints of the short selling system, promote the optimization of the company's equity structure, improve the efficiency of independent directors' performance, and reduce the motivation for unfair related party transactions from within;

(4) To improve the quality of information disclosure, regulatory authorities should strengthen the disclosure requirements for related party transactions, reduce information asymmetry, and assist short selling mechanisms in playing a role.

References

- [1] Jensen, M.C., Meckling, W.H. (1976) Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3: 305-360.
- [2] Johnson, S., La Porta, R., Lopez-de-Silanes, F., Shleifer, A. (2000) Tunneling. *American Economic Review*, 90: 22-27.
- [3] Jian, M., Wong, T.J. (2010) Earnings management and tunneling through related party transactions: Evidence from Chinese listed companies. *Journal of Corporate Finance*, 16: 445-461.
- [4] La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R.W. (2000) Investor protection and corporate governance. *Journal of Financial Economics*, 58: 3-27.
- [5] Liu, H. (2020) Related party transactions and interest transmission under concentrated equity structure: Evidence from China. *China Journal of Accounting Research*, 13: 289-310.
- [6] Massa, M., Zhang, H., Zhang, L. (2015) Short selling and earnings management: A natural experiment. *Journal of Financial Economics*, 118: 191-210.
- [7] Fang, V.W., Huang, J., Karpoff, J.M. (2016) Short sellers, information, and price efficiency. *Journal of Financial Economics*, 120: 22-40.
- [8] Callen, J.L., Fang, X. (2015) Short interest, institutional ownership, and stock price crash risk. *Journal of Financial Economics*, 117: 431-448.
- [9] Li, Z., Zhang, Y. (2018) Short selling and corporate misconduct: Evidence from China's margin trading program. *China Journal of Accounting Research*, 11: 107-130.
- [10] Jin, Q., Chen, G., Zhang, C. (2018) Short selling and tunneling: Evidence from China's securities lending and borrowing market. *Journal of Corporate Finance*, 51: 226-245.
- [11] Chen, G., Jin, Q., & Zhang, C. (2021). Short selling and related party transactions: Evidence from China's margin trading program. *China Journal of Accounting Research*, 14(2): 189-216.
- [12] Li, X.R., Wang, Y., Chen, G. (2021) Short selling mechanism and capital market response to related party transaction announcements: Evidence from China. *China Journal of Accounting Studies*, 9(3): 389-412.
- [13] Dyck, A., Zingales, L. (2008) Private benefits of control: An international comparison. *Journal of Finance*, 63(3): 537-600.
- [14] Baron, R.M., Kenny, D.A. (1986) The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6): 1173-1182.