Frontiers in Economics and Management Volume 6 Issue 10, 2025
ISSN: 2692-7608 DOI: 10.6981/FEM.202510_6(10).0005

The Impact of Short-Selling Mechanism on Corporate Information Disclosure Quality

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Abstract

In this study, we selected A-share listed companies from 2010 – 2024, empirically examining the impact of short-selling mechanism introduction on their disclosure quality. Post-introduction, disclosure quality significantly improved. For robustness, we excluded special-year samples and used year-end ETF holdings/tradable shares ratio as instrumental variable in regression. Even under stricter tests, conclusions remained: short-selling introduction positively affects disclosure quality. This study confirms allowing short-selling effectively promotes listed firms to enhance disclosure transparency and quality.

Keywords

Short-selling Mechanism; Information Disclosure; Difference-in-Differences.

1. Introduction

In modern finance, disclosure quality is key for market transparency and investor protection. Chu & Fang argued that High-quality disclosure cuts risk, aiding market health[1]. Li & Liu found Short-selling (key trading mechanism) theoretically incentivizes corporate negative info exposure, boosting disclosure transparency/quality[2]. Chen & Liu and Gu & Lu analyzed short-selling's impact on earnings management via governance and supervision, respectively[3,4]. Li & Liu provided direct evidence using China's quasi-natural experiment[5].

Despite rich foundations, limitations remain: focus on developed markets (limited emerging market research, e.g., China); literature emphasizes earnings management over disclosure quality. This study addresses gaps by exploring short-selling's impact on Chinese firms' disclosure quality (unique context), integrating provincial marketization indices to reveal its role in enhancing disclosure timeliness/accuracy.

2. Literature Review and Research Hypotheses

2.1. Literature Review

Information disclosure refers to public companies' release of corporate and related information to investors and the public via prospectuses, listing announcements, periodic and ad hoc reports. Chen & Liu and Gu & Lu found short-selling mechanisms constrain earnings management through corporate governance and market supervision channels[6,7]. Li & Liu provided direct evidence that short-selling improves disclosure quality using China's quasi-natural experiment[8]. Wang analyzed highlighted short-selling's role in enhancing disclosure timeliness and accuracy[9].

Diamond & Verrecchia argued short-selling incentivizes negative information discovery, improving transparency[10]. Karpoff & Lou emphasized short-selling strengthens regulatory oversight and increases financial misstatement detection risks[11]. Despite existing research,

ISSN: 2692-7608 DOI: 10.6981/FEM.202510_6(10).0005

gaps remain regarding emerging markets like China and comprehensive disclosure quality impacts. This study examines short-selling's effects on Chinese firms' disclosure quality, integrating provincial marketization indices to reveal its role in enhancing timeliness and accuracy within China's unique context.

2.2. Research Hypotheses

Short-selling (market oversight mechanism) lets investors short overvalued stocks, boosting market sensitivity to negative info. Jarrow found poor firm disclosure may be exploited by short-sellers to short, causing price declines[12]. This risk incentivizes firms to improve disclosure quality for self-interest.

H1: Short-selling significantly enhances corporate disclosure quality.

Large firms (abundant resources, stronger risk resistance) better withstand short-selling pressure. Small firms (limited resources, weaker resilience) more susceptible to short-selling. To address pressure/attract investors, small firms may proactively improve disclosure to boost confidence with Zhou[13]. Thus, we hypothesize differential short-selling effects on disclosure quality by firm size.

H2: Short-selling's impact on disclosure quality varies by firm size.

3. Research Design

3.1. Data Source and Sample Selection

The Shenzhen Stock Exchange (SZSE) conducts annual evaluations of listed companies' information disclosure, providing an objective measure for this research. This study examines SZSE A-share listed firms from 2010–2024, with data sourced from the CSMAR Database. Sample processing: (1) Exclude firms IPO after 2010; (2) insolvent firms; (3) financial firms; (4) ST firms and samples with missing key variables. Additionally, 1% winsorization is applied to all continuous variables to mitigate outliers.

3.2. Model Construction

$\sum YEAR$fixed effects,$\sum IND$fixed effects, and $\sum PROVINCE$fixed effects are controlled for, and εi,t is the error term.

3.2.1. The Ratio of Securities Lending Balance to Tradable Market Value

To examine the impact of the ratio of securities lending balance to tradable market value on information disclosure quality (high-quality score) and information disclosure (ordinal quality), this paper constructs the following regression model:

$$Y_{i,t} = \alpha + \beta_1 X_{i,t} + \gamma Controls_{i,t} + \theta \sum YEAR + \rho \sum IND + \sigma \sum PROVINCE + \varepsilon_{i,t} \quad (1)$$

Model: Yi,t = dependent variable (regression equation) – info disclosure quality (high-quality score) or info disclosure (ordinal quality); Xi,t = independent variable – securities lending balance/tradable market value ratio; Controls: leverage ratio, ROE, total asset growth rate, ln(listing years), board size, independent director ratio, largest shareholder ownership ratio, institutional ownership ratio, chairman-CEO duality, standard unqualified audit opinion.

3.2.2. Short-selling System

To verify the impact of the short-selling system on information disclosure quality (high-quality score) and information disclosure (ordinal quality), this paper constructs a multi-period DID model as follows:

$$Y_{i,t} = \alpha + \beta_1 DID_{i,t} + \gamma Controls_{i,t} + \theta \sum YEAR + \rho \sum IND + \sigma \sum PROVINCE + \varepsilon_{i,t} \quad (2)$$

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Model: Yi,t = dependent variable (regression equation) – info disclosure quality (high-quality score) or info disclosure (ordinal quality); Xi,t = independent variable – constructed DID variable (short-selling system); Controls: leverage ratio, ROE, total asset growth rate, ln(listing years), board size, independent director ratio, largest shareholder ownership ratio, institutional ownership ratio, chairman-CEO duality, standard unqualified audit opinion.

3.3. Descriptive Statistics

Table 1 presents descriptive statistics of variables. Disclosure quality has a mean of 0.875, indicating most firms have high quality, with SD 0.331 showing variability. For short-selling, mean=0.36, SD=0.48, indicating varying implementation. Other variables are in Table 1.

Table 1. Descriptive Statistical Results

Variable	Obs	Mean	Std. Dev.	Min	Max
Information Disclosure Quality (High-Quality Score)	28426	0.875	0.331	0	1
Information Disclosure (Ordered Quality)	28426	3.054	0.603	1	4
Ratio of Securities Lending Balance to Tradable Market Value	28426	0	0.001	0	0.005
Short-selling System	28426	0.36	0.48	0	1
Asset-Liability Ratio	28426	0.396	0.2	0.05	0.896
Return on Net Assets	28426	0.057	0.135	-0.743	0.354
Total Asset Growth Rate	28426	0.164	0.365	-0.522	2.177
Natural Logarithm of Listing Years	28426	2.925	0.349	1.792	3.555
Board Size	28426	2.107	0.191	1.609	2.565
Proportion of Independent Directors	28426	37.656	5.269	33.33	57.14
Shareholding Ratio of the Largest Shareholder	28426	35.719	14.749	7.64	74.46
Institutional Shareholding Ratio	28426	41.159	25.107	0.266	90.707
Chairman Concurrently Serving as General Manager	28426	0.321	0.467	0	1
Standard Unqualified Audit Opinion	28426	0.975	0.157	0	1

4. Empirical Analysis

4.1. Parallel Trend Test

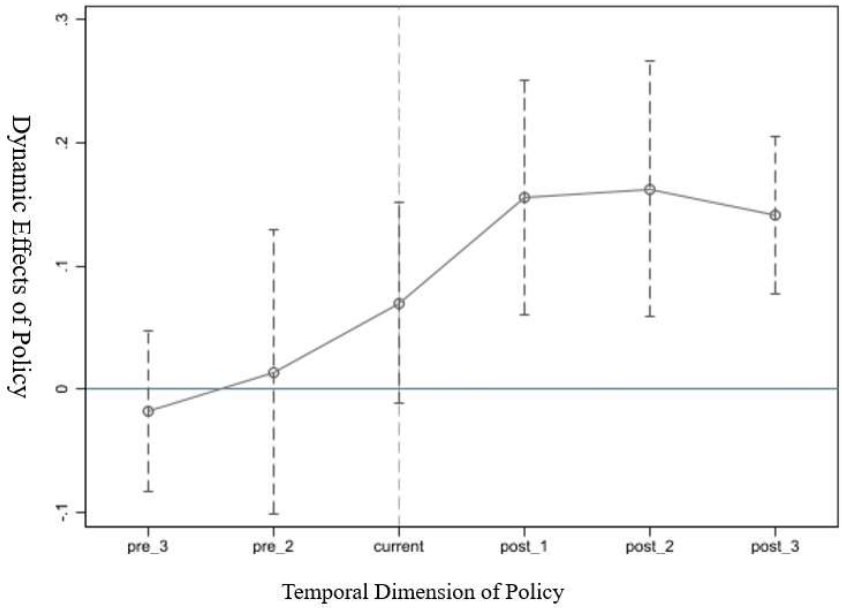

Figure 1. Information Disclosure Quality (High-Quality)

ISSN: 2692-7608 DOI: 10.6981/FEM.202510_6(10).0005

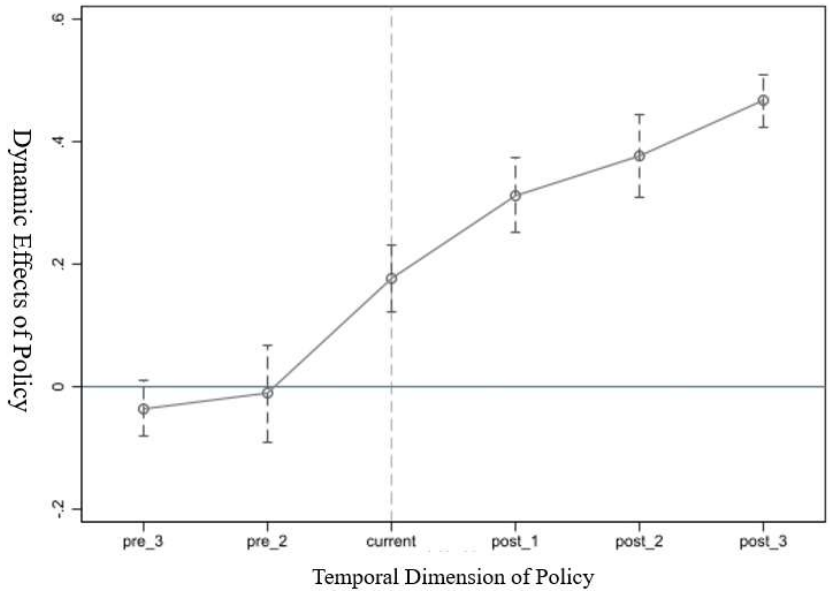

Figure 2. Information Disclosure Quality (Ordered Quality)

The validity of the DID model relies on the parallel trend assumption. Figs. 1–2 show dynamic trends of disclosure quality and its estimated coefficients. Results show pre-policy, estimated coefficients of policy dummies are insignificant, indicating no significant differences in disclosure quality between firms, satisfying the parallel trend assumption. Post-policy, coefficients are significant and increasing, indicating short-selling has a positive and strengthening effect on improving disclosure quality.

4.2. Benchmark Regression Analysis

Table 2: Regression of securities lending/tradable value ratio on disclosure quality. Significantly positive impact (coeffs 1.044, 1.669; both sig. at 1%).

Table 2: DID model of short-selling impact on disclosure quality. Significantly positive impact (coeffs 0.166, 0.415; both sig. at 1%). Short-selling enhances transparency/fairness, reduces info asymmetry, promotes efficient resource allocation/economic growth. Non-shortable markets: managers may conceal/exaggerate info. Shortable markets: negative info exposure harms managers' interests, prompting better disclosure accuracy/completeness.

ISSN: 2692-7608 DOI: 10.6981/FEM.202510_6(10).0005

Table 2. The Ratio of Securities Lending Balance to Tradable Market Value and Information Disclosure Quality

	(1)	(2)	(3)	(4)
	Information Disclosure Quality (High-Quality)	Information Disclosure Quality (Ordered Quality)	Information Disclosure Quality (High-Quality)	Information Disclosure Quality (Ordered Quality)
Short-selling System			0.166***	0.415***
			(6.496)	(23.501)
Ratio of Securities Lending Balance to Tradable Market Value	1.044***	1.669***		
	(4.567)	(13.480)		
Asset-Liability Ratio	-0.636***	-0.387***	-0.650***	-0.439***
	(-10.379)	(-9.152)	(-10.590)	(-10.347)
Return on Net Assets	1.540***	1.824***	1.516***	1.745***
	(18.881)	(29.220)	(18.588)	(28.075)
Total Asset Growth Rate	0.004	0.002	0.016	0.035
	(0.124)	(0.100)	(0.491)	(1.541)
Listing Years	-0.166***	-0.109***	-0.176***	-0.133***
	(-4.257)	(-4.344)	(-4.521)	(-5.284)
Board Size	0.463***	0.623***	0.440***	0.558***
	(6.644)	(12.229)	(6.289)	(10.938)
Independent Director Ratio	0.001	0.011***	0.000	0.009***
	(0.384)	(6.160)	(0.184)	(5.184)
Largest Shareholder's Shareholding Ratio	0.009***	0.006***	0.009***	0.006***
	(10.765)	(10.699)	(10.963)	(11.548)
Institutional Shareholding Ratio	0.002***	0.006***	0.002***	0.005***
	(3.847)	(17.901)	(3.211)	(14.935)
Chairman Concurrently Serves as General Manager	0.012	-0.036**	0.016	-0.025
	(0.502)	(-2.281)		
Standard Unqualified Audit Opinion	1.736***	1.527***	1.731***	1.518***
	(27.705)	(30.785)	(27.646)	(30.569)
Time Effect	Yes	Yes	Yes	Yes
Province Effect	Yes	Yes	Yes	Yes
Industry Effect	Yes	Yes	Yes	Yes
N	28342	28426	28342	28426
R2	0.172	0.117	0.173	0.124
***p<0.01", "**p<0.05", "*p<0.10				

ISSN: 2692-7608 DOI: 10.6981/FEM.202510_6(10).0005

5. Robustness Tests

5.1. Variable Replacement Method

To test result robustness, this study uses variable replacement by substituting disclosure quality with KV index (Table 3). The ratio of securities lending balance to tradable market value shows a significant positive impact on disclosure quality (coeff=0.246, P<0.01). Short-selling system coefficient is 0.063 (P<0.01), also significant at 1% level. Consistent with baseline regression, confirming model robustness.

Table 3. Variable Replacement Method

	(1)	(2)
	Information Disclosure Quality (KV Index)	Information Disclosure Quality (KV Index)
Ratio of Securities Lending Balance to Tradable Market Value	0.246***	
	(9.328)	
Short-selling System		0.063***
		(14.008)
Asset-Liability Ratio	0.002	0.001
	(0.176)	(0.109)
Return on Net Assets	0.099***	0.098***
	(9.516)	(9.477)
Total Asset Growth Rate	0.021***	0.023***
	(6.080)	(6.656)
Listing Years	0.124***	0.115***
	(5.027)	(4.762)
Board Size	0.015	0.010
	(1.000)	(0.707)
Independent Director Ratio	0.001***	0.001***
	(2.928)	(2.766)
Largest Shareholder's Shareholding Ratio	-0.001***	-0.001***
	(-2.924)	(-2.789)
Institutional Shareholding Ratio	0.002***	0.002***
	(11.779)	(12.305)
Chairman Concurrently Serves as General Manager	-0.003	-0.004
	(-0.742)	(-0.943)
Standard Unqualified Audit Opinion	0.003	0.003
	(0.400)	(0.432)
Time Effect	Yes	Yes
Province Effect	Yes	Yes
Industry Effect	Yes	Yes
N	28426	28426
R^2	0.149	0.153
***p<0.01", "**p<0.05", "*p<0.10		

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5.2. Excluding Special Years

To further verify result robustness, this study excludes special years. Given the 2015 Chinese stock market crash and subsequent margin trading rule adjustments, 2015 is excluded for regression (results in table). The ratio of securities lending balance to tradable market value shows significant positive impact on disclosure quality (coeff=1.049, 1.666; P<0.01, 1% significance). Short-selling system coefficient is 0.156, 0.407 (P<0.01, 1% significance). Consistent with baseline regression, confirming model robustness.

Table 4. Excluding Special Years

	(1)	(2)	(1)	(2)
	Information Disclosure Quality (High-Quality)	Information Disclosure Quality (Ordered Quality)	Information Disclosure Quality (High-Quality)	Information Disclosure Quality (Ordered Quality)
Ratio of Securities Lending Balance to Tradable Market Value	1.049***	1.666***		
	(4.575)	(13.416)		
Short-selling System			0.156***	0.407***
			(6.006)	(22.605)
Asset-Liability Ratio	-0.636***	-0.384***	-0.648***	-0.433***
	(-10.128)	(-8.886)	(-10.307)	(-9.983)
Return on Net Assets	1.551***	1.819***	1.529***	1.743***
	(18.640)	(28.659)	(18.375)	(27.562)
Total Asset Growth Rate	0.003	0.004	0.015	0.036
	(0.094)	(0.181)	(0.435)	(1.540)
Listing Years	-0.167***	-0.104***	-0.177***	-0.129***
	(-4.170)	(-4.024)	(-4.432)	(-4.989)
Board Size	0.447***	0.623***	0.427***	0.559***
	(6.279)	(11.951)	(5.970)	(10.725)
Independent Director Ratio	0.001	0.011***	0.001	0.009***
	(0.392)	(6.060)	(0.226)	(5.159)
Largest Shareholder's Shareholding Ratio	0.009***	0.006***	0.009***	0.006***
	(10.775)	(10.430)	(10.948)	(11.222)
Institutional Shareholding Ratio	0.002***	0.006***	0.002***	0.005***
	(3.776)	(17.954)	(3.221)	(15.130)
Chairman Concurrently Serves as General Manager	0.018	-0.029*	0.022	-0.018
	(0.765)	(-1.826)	(0.935)	(-1.142)
Standard Unqualified Audit Opinion	1.754***	1.538***	1.749***	1.529***
	(27.343)	(30.482)	(27.290)	(30.276)
Time Effect	Yes	Yes	Yes	Yes
Province Effect	Yes	Yes	Yes	Yes
Industry Effect	Yes	Yes	Yes	Yes
N	27015	27094	27015	27094
R^2	0.175	0.119	0.176	0.125
***p<0.01", "**p<0.05", "*p<0.10				

ISSN: 2692-7608 DOI: 10.6981/FEM.202510_6(10).0005

6. Endogeneity Tests

To address endogeneity, this study uses instrumental variable method (year-end ETF holdings as % of tradable shares) with two-stage regression: 1st stage (instrument vs. endogenous variable); 2nd stage (predicted endogenous variable vs. dependent variable). Both stages passed (good endogeneity control). Table: 1st stage coeff=0.0756 (P<0.01, strong instrument power); 2nd stage: securities lending/tradable value ratio positively impacts disclosure quality (coeffs 14.7331, 16.0578; P<0.01). Confirms model robustness, no endogeneity issues.

Table 5. Endogeneity Test Results

	(1)	(2)	(3)
	Ratio of Securities Lending Balance to Tradable Market Value	Information Disclosure Quality (High-Quality)	Information Disclosure Quality (Ordered Quality)
Ratio of Year-end ETF Holdings to Tradable Shares	0.0756***		
	(14.115)		
Ratio of Securities Lending Balance to Tradable Market Value		14.7331***	16.0578***
		(7.642)	(15.667)
Asset-Liability Ratio	0.0059***	-0.7004***	-0.4514***
	(2.813)	(-11.226)	(-10.617)
Return on Net Assets	0.0138***	1.2673***	1.5115***
	(4.531)	(14.119)	(23.030)
Total Asset Growth Rate	0.0015	-0.0452	-0.0584**
	(1.206)	(-1.347)	(-2.556)
Listing Years	-0.0020	-0.1066***	-0.0446*
	(-1.386)	(-2.698)	(-1.746)
Board Size	0.0186***	0.2019***	0.3568***
	(7.217)	(2.582)	(6.564)
Independent Director Ratio	0.0003***	-0.0036	0.0060***
	(3.518)	(-1.418)	(3.337)
Largest Shareholder's Shareholding Ratio	-0.0002***	0.0122***	0.0092***
	(-6.771)	(12.787)	(15.496)
Institutional Shareholding Ratio	0.0002***	-0.0016**	0.0022***
	(13.470)	(-2.362)	(5.501)
Chairman Concurrently Serves as General Manager	-0.0004	0.0038	-0.0470***
	(-0.518)	(0.162)	(-2.977)
Standard Unqualified Audit Opinion	0.0049***	1.6514***	1.4489***
	(3.398)	(25.929)	(29.246)
Time Effect	Yes	Yes	Yes
Province Effect	Yes	Yes	Yes
Industry Effect	Yes	Yes	Yes
N	28426	28342	28426
R^2	0.132	0.174	0.118
***p<0.01", "**p<0.05", "*p<0.10			

ISSN: 2692-7608 DOI: 10.6981/FEM.202510_6(10).0005

7. Heterogeneity Analysis

To examine impacts of securities lending balance, tradable market value, and short-selling system on disclosure quality based on differing development philosophies across firm sizes, samples are split into large/small firms by mean size, analyzing specific factor impacts (results in table).

7.1. Impact of Securities Lending Balance Ratio on Information Disclosure Quality

In small firms, securities lending/tradable value ratio coeff=0.578 (insignificant), but significant positive impact at 5% level (coeff=0.503, P<0.05). In large firms, ratio shows significant positive impact at 1% level (coeff=1.018, 1.330; both P<0.01). Fisher's combined test and 1000 bootstrap empirical P-value <0.01 for ratio coefficient, indicating significant group differences. Small firms: limited resources, lower disclosure quality, simple governance, poor internal controls/risk management. Large firms: abundant resources, higher disclosure quality, complex governance, robust internal controls/risk management.

Table 6. Heterogeneity Results by Enterprise Size 1

	Small-Scale		Large-Scale	
	Information Disclosure Quality (High-Quality)	Information Disclosure Quality (Ordered Quality)	Information Disclosure Quality (High-Quality)	Information Disclosure Quality (Ordered Quality)
Ratio of Securities Lending Balance to Tradable Market Value	0.578	0.503**	1.018***	1.330***
	(1.102)	(2.273)	(3.964)	(9.569)
Asset-Liability Ratio	-0.868***	-0.835***	-0.522***	-0.523***
	(-9.750)	(-12.504)	(-5.208)	(-8.110)
Return on Net Assets	1.580***	1.522***	1.404***	1.819***
	(13.455)	(17.404)	(11.761)	(20.304)
Total Asset Growth Rate	-0.080*	0.037	0.096*	-0.022
	(-1.753)	(1.034)	(1.900)	(-0.752)
Listing Years	-0.277***	-0.184***	-0.049	-0.094**
	(-5.309)	(-5.106)	(-0.819)	(-2.491)
Board Size	0.307***	0.397***	0.461***	0.585***
	(2.983)	(5.157)	(4.522)	(8.337)
Independent Director Ratio	-0.006*	0.000	0.002	0.013***
	(-1.695)	(0.144)	(0.643)	(5.499)
Largest Shareholder's Shareholding Ratio	0.011***	0.007***	0.007***	0.005***
	(8.885)	(8.938)	(5.638)	(6.371)
Institutional Shareholding Ratio	-0.000	0.002***	0.004***	0.007***
	(-0.525)	(3.934)	(5.028)	(14.155)
Chairman Concurrently Serves as General Manager	0.021	-0.024	0.031	0.003
	(0.668)	(-1.063)	(0.837)	(0.135)
Standard Unqualified Audit Opinion	1.676***	1.422***	1.782***	1.550***
Ratio of Securities Lending Balance to Tradable Market Value	(19.176)	(21.566)	(18.824)	(20.331)
Empirical P-value		0.01		
Time Effect	Yes	Yes	Yes	Yes
Province Effect	Yes	Yes	Yes	Yes
Industry Effect	Yes	Yes	Yes	Yes
N	14227	14227	14199	14199
R^2	0.202	0.127	0.166	0.117
***p<0.01", "**p<0.05", "*p<0.10				

ISSN: 2692-7608 DOI: 10.6981/FEM.202510_6(10).0005

7.2. Short-selling System and Information Disclosure Quality

Small firms: securities lending/tradable value ratio coeff=0.578 (insignificant), but sig. positive at 5% (0.503, P<0.05). Large firms: ratio sig. positive at 1% (1.018, 1.330; both P<0.01). Fisher test & 1000 bootstrap: ratio coeff P<0.01 (significant group differences). Small firms: limited resources, lower disclosure quality, simple governance, poor internal controls/risk management. Large firms: abundant resources, higher disclosure quality, complex governance, robust internal controls/risk management.

Table 7. Heterogeneity Results by Enterprise Size 2

	Small-Scale		Large-Scale	
	Information Disclosure Quality (High-Quality)	Information Disclosure Quality (Ordered Quality)	Information Disclosure Quality (High-Quality)	Information Disclosure Quality (Ordered Quality)
Short-selling System	0.128***	0.125***	0.146***	0.395***
	(2.662)	(3.901)	(4.270)	(17.485)
Asset-Liability Ratio	-0.853***	-0.818***	-0.516***	-0.516***
	(-9.525)	(-12.180)	(-5.146)	(-7.951)
Return on Net Assets	1.576***	1.515***	1.390***	1.754***
	(13.443)	(17.336)	(11.655)	(19.642)
Total Asset Growth Rate	-0.079*	0.039	0.116**	0.026
	(-1.715)	(1.100)	(2.296)	(0.908)
Listing Years	-0.275***	-0.181***	-0.071	-0.144***
	(-5.271)	(-5.004)	(-1.188)	(-3.816)
Board Size	0.309***	0.401***	0.445***	0.522***
	(3.011)	(5.205)	(4.357)	(7.449)
Independent Director Ratio	-0.006	0.001	0.002	0.010***
	(-1.623)	(0.251)	(0.451)	(4.357)
Largest Shareholder's Shareholding Ratio	0.011***	0.007***	0.007***	0.005***
	(8.957)	(9.053)	(5.721)	(7.046)
Institutional Shareholding Ratio	-0.000	0.002***	0.004***	0.006***
	(-0.590)	(3.819)	(4.755)	(12.339)
Chairman Concurrently Serves as General Manager	0.020	-0.024	0.036	0.014
	(0.645)	(-1.071)	(0.991)	(0.590)
Standard Unqualified Audit Opinion	1.679***	1.426***	1.777***	1.544***
	(19.219)	(21.592)	(18.846)	(20.442)
Empirical P-value	0.05	0.01		
Time Effect	Yes	Yes	Yes	Yes
Province Effect	Yes	Yes	Yes	Yes
Industry Effect	Yes	Yes	Yes	Yes
N	14227	14227	14199	14199
R^2	0.202	0.127	0.166	0.124
***p<0.01", "**p<0.05", "*p<0.10				

ISSN: 2692-7608 DOI: 10.6981/FEM.202510_6(10).0005

8. Conclusion

Empirical analysis concludes short-selling system has a significantly positive impact on disclosure quality, with significant differences across firm sizes. For small firms, despite challenges of limited resources and simpler governance, short-selling introduction still effectively improves disclosure quality. However, compared to large firms, small firms show a smaller improvement magnitude. This may be because large firms have more resources and robust governance, better responding to market pressures and investor scrutiny.

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