A Study of the Impact of Short-selling Mechanisms on Auditor Behavior: Evidence from China

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Abstract: This paper studies the effect of margin-trading eligibility on auditor behavior. Using the phased expansion of margin trading in China's A-share market from 2004 to 2023, and a staggered DID method, it finds that audit fees rise modestly (about 1.5%, marginally significant), but audit report lag and audit opinions do not show robust changes. After PSM-DID matching, all three dimensions become statistically significant, yet the economic magnitudes remain small. When the sample is limited to 2013–2018, the fee effect flips sign, suggesting that the effect may shift as the institution evolves. Both marketization and state ownership weaken the short-selling effect, especially in less developed regions and non-state firms. Overall, the incremental impact of margin-trading eligibility on auditors is limited and highly dependent on the institutional context.

Keywords: Margin Trading; Audit Fees; Audit Report Lag; Audit Opinions; Marketization

1. Introduction

In March 2010, a margin-trading pilot brought short selling to China's A-share market for the first time. Short sellers profit by uncovering negative corporate news, which naturally tightens outside scrutiny of listed firms. The literature has moved from market-level questions toward intermediary-level ones, spanning earnings management [1][2] and auditor behavior [3][4]. As gatekeepers of the capital market, auditors work to reduce information asymmetry while bearing "deep-pocket" liability [5]. A 2007 judicial interpretation by the Supreme People's Court clarified the path for civil claims against auditors, making their litigation exposure considerably more concrete. Once a firm becomes eligible for margin trading, the accompanying scrutiny and information mining can push managers toward more covert opportunism, raising the litigation risk that auditors face. Treating the phased expansion of margin trading as a quasi-natural experiment, this paper applies a staggered DID design to examine how margin-trading eligibility affects auditor behavior through audit fees, audit report lag, and audit opinions, and explores the contextual heterogeneity of these effects.

2. Literature Review

Short-selling research spans the market, the firm, and—more recently—the intermediary. At the market level, most studies find that short selling improves pricing efficiency and liquidity, though disagreements persist [6,7]. Firm-level evidence shows that short selling curbs earnings management [8], but it can also facilitate well-timed insider sales under certain conditions [9], complicating its governance role. A recent strand of work turns to auditors; one study finds that short selling raises the quality of key audit matter disclosures [10]. What is still lacking, however, is a multi-dimensional picture of how short selling shapes auditor behavior.

Studies on auditor behavior have long revolved around audit fees, audit report lag, and audit opinions. Simunic [11] established client size as the dominant determinant of fees, a finding later extended to business complexity [12] and auditor size [13]. Ashton [14] pioneered the empirical work on audit report lag, identifying client size and audit complexity as the main drivers; more recent evidence shows that managerial ability significantly shortens reporting delays [15]. In the audit opinion domain, Mutchler [16] identified financial distress as the core predictor of going-concern opinions, deeply shaping later work on the information content of modified opinions.

On the whole, the short-selling literature has begun to engage with auditing but has yet to offer a multi-dimensional framework. This paper attempts to close that gap by linking short selling

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to audit fees, audit report lag, and audit opinions simultaneously, and by introducing marketization and state ownership as moderators.

3. Theoretical Analysis and Research Hypotheses

3.1 Short Selling and Audit Fees

Simunic [11] separates audit fees into engagement costs and a premium for expected litigation losses. Short selling pushes fees up through both channels. On the cost side, short sellers dig up negative information about target firms [17]; this outside scrutiny pushes managers toward subtler earnings manipulation [1], forcing auditors to expand testing and add substantive work—all of which raises the direct cost of the audit [18]. On the litigation side, auditing's insurance theory casts the auditor as a deep-pocket defendant [5] from whom investors can recover losses when financial statements prove misleading. For a margin-trading investor who loses money and later finds the audit report flawed, litigation is a realistic path [3]. In 2007, China's Supreme People's Court made it easier to bring civil claims against auditors, making the threat feel more concrete. With higher expected litigation costs, auditors add a risk premium to their fees. Rising costs and greater legal exposure both push audit fees upward. Hypothesis 1 follows.

H1: Other things equal, audit fees increase significantly after a company becomes eligible for margin trading.

3.2 Short Selling and Audit Report Lag

Once short selling takes hold, the pressure can push managers toward more covert earnings manipulation [2], making material misstatements harder to spot and forcing auditors to carry out additional substantive work—all of which lengthens the audit. At the same time, short selling heightens market scrutiny of audit quality [4], compelling auditors to exercise greater caution and commit extra resources to keeping audit failure risk in check [18]. Communication between auditors and their clients becomes more complex as well. Therefore, Hypothesis H2 is proposed.

H2: Ceteris paribus, audit report lag increases significantly after a listed company becomes eligible for margin trading.

3.3 Short Selling and Audit Opinions

First, short selling pressure may exacerbate earnings management by managers, increasing the risk of material misstatements. To maintain stock prices, management may adopt more aggressive accounting policies [8]. If management refuses to make adjustments, auditors must issue modified audit opinions to avoid legal liability. Second, short selling increases auditors' litigation risk, and auditors tend to adopt conservative strategies under uncertainty. Third, short selling raises market attention to audit quality [4], and under heightened monitoring pressure, auditors are more inclined to issue modified audit opinions. Taken together, Hypothesis H3 is proposed.

H3: Ceteris paribus, the probability of receiving a modified audit opinion increases significantly after a listed company becomes eligible for margin trading.

4. Method

4.1 Sample Selection and Data Sources

This paper uses A-share listed companies on the Shanghai and Shenzhen Stock Exchanges from 2004 to 2023 as the research sample. The sample excludes financial firms, ST, *ST and PT firms, observations with severe missing data, and companies previously removed from the margin trading list. The final sample consists of 38,568 firm-year observations. All data are obtained from the CSMAR database. Continuous variables are winsorized at the 1% level, and standard errors are clustered at the firm level.

4.2 Variable Selection and Measurement

Dependent Variables: Following [4], auditor behavior is measured using three indicators: audit fees (LnFee, the natural logarithm of total annual audit fees), audit report lag (LnDelay, the natural logarithm of the number of days from the balance sheet date to the audit report date), and audit opinion (Opinion, a dummy variable equal to 0 for a standard unqualified audit opinion and 1 otherwise).

Independent Variables. Following Chen and Liu [8], List is coded 1 when a firm is in the margin trading list during the sample period, and Post is coded 1 from the inclusion year onward. The interaction List×Post is the key variable and gives the DID estimate. Since List is time-invariant, firm fixed effects absorb it, leaving List×Post as the treatment variable that

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actually operates in the model.

Control Variables. Drawing on Simunic [11] and later studies, the following firm characteristics are controlled for: size (Size, natural log of total assets), leverage (Lev, total liabilities over total assets), return on assets (ROA), a loss dummy (Loss), auditor type (Big4), business complexity (Invrec, inventory plus receivables over total assets), asset growth (AssetG), book-to-market ratio (BTM), quick ratio (Quick), and the current assets ratio (Ca/Ta, current assets over total assets).

Moderating Variables. Marketization (MKT) is measured by the Fan Gang Marketization Index, a common province-level indicator. State ownership (SOE) is a dummy coded 1 for state-owned enterprises and 0 otherwise.

PSM Matching Variables. Following the four criteria used by the China Securities Regulatory Commission (CSRC) to select margin-trading eligible securities, the following covariates are used in the propensity score matching stage: shareholder base (Snum, the natural logarithm of the number of shareholders), average daily turnover rate (Turnr, annual average daily turnover rate), listing age (Age, the natural logarithm of the number of days from the listing date to the end of the sample period), and tradable market value (Mvalue, the natural logarithm of annual tradable market value).

4.3 Model Specification

Following [4][19], this paper uses a staggered DID model. The baseline specification is:

$$Y_{i,t}=\beta_0+\beta_1 \text{List}\times\text{Post}_{i,t}+\beta_2 \text{Controls}_{i,t}+\Sigma \text{ Firm}+\Sigma \text{ Year}+\varepsilon \quad (1)$$

The subscripts i and t index firms and years. The dependent variable $Y_{i,t}$ is alternately LnFee, LnDelay, and Opinion. The coefficient β_1 on List×Post gives the difference-in-differences estimate. Since List is time-invariant, firm fixed effects absorb it, and List×Post effectively serves as the post-treatment indicator. The control vector $\text{Controls}_{i,t}$ includes Size, Lev, BTM, ROA, Loss, Ca/Ta, Quick, Invrec, AssetG, and Big4. Firm fixed effects (Σ Firm) and year fixed effects (Σ Year) enter all specifications, and ε denotes the error term. Standard errors are clustered at the firm level throughout.

5. Empirical Results

5.1 Descriptive Statistics and Correlation Analysis

The sample has 38,568 firm-year observations. The mean of LnFee is 13.783 (SD=0.718), LnDelay is 4.562, and Opinion is 0.015. List×Post has a mean of 0.368, so about 37% of observations come after inclusion. List×Post is positively correlated with audit fees (r=0.436, p<0.01) and audit report lag (r=0.140, p<0.01). It barely correlates with Opinion. Pairwise correlations among controls stay under 0.6. The strong ROA–Loss link follows from how the two variables are defined. Continuous variables are winsorized at the 1st and 99th percentiles.

5.2 Regression Analysis

Table 1 reports the baseline DID estimates. For audit fees (Column 1), the coefficient on List×Post is 0.015. It is marginally significant at the 10% level. This means audit fees rose about 1.5% after a firm became eligible. This offers partial support for H1. For audit report lag and audit opinions (Columns 2 and 3), the coefficients are small and insignificant. H2 and H3 are not supported. The fee increase looks more like a risk premium. It does not appear to come from a big expansion of audit effort. Firm size and Big-4 auditor are both positively linked to fees. This matches earlier work. These results are different from Zhang [19]. The longer sample window and the stricter firm-fixed-effects specification might explain the difference.

Table 1. Regression Analysis

	(1) LnFee	(2) LnDelay	(3) Opinion
List× Post	0.015* (0.009)	0.006 (0.005)	0.005 (0.003)
Size	0.347*** (0.011)	0.049*** (0.005)	-0.007** (0.003)
Lev	-0.032 (0.034)	-0.062*** (0.018)	0.058*** (0.015)
ROA	-0.159** (0.069)	-0.504*** (0.039)	-0.184*** (0.033)
Loss	0.060*** (0.008)	0.017*** (0.005)	0.031*** (0.005)
Big4	0.346*** (0.036)	-0.027** (0.013)	-0.011 (0.008)
Invrec	0.031 (0.042)	0.045* (0.023)	-0.022 (0.016)
AssetG	-0.033*** (0.007)	-0.020*** (0.004)	-0.007*** (0.002)
BTM	-0.011 (0.019)	0.035*** (0.010)	-0.004 (0.006)
Quick	-0.000 (0.002)	-0.002 (0.001)	0.000 (0.001)

Ca/Ta	-0.092*** (0.032)	-0.013 (0.018)	0.020* (0.012)
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
N	38,568	38,568	38,568
Adj. R^2	0.713	0.164	0.029

Note: Robust standard errors clustered at the firm level are in parentheses. All models include firm and year fixed effects. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

5.3 Robustness Checks

Parallel Trend. An event study uses the year before inclusion as the baseline. Pre-treatment coefficients (pre2 to pre5) are all insignificant. Their confidence intervals cross zero. The parallel-trend assumption holds for audit fees and audit report lag.

PSM-DID. A 1:1 nearest-neighbor match is run on shareholder base, turnover, listing age, and tradable market value. After matching, covariate standardized biases are all under 10%. In the matched sample, the coefficients are: audit fees 0.015 (SE=0.009), audit report lag 0.011 (SE=0.005), audit opinion 0.006 (SE=0.003). All are significant at the 10% level or better.

Shortening the Sample Window. The sample is cut to 2013–2018. This drops the financial crisis, the 2015 turmoil, the pandemic, and the new Securities Law. The audit-fee coefficient becomes −0.027 ($p<0.10$). The sign flips, compared to Zhang [19]. Short selling's effect may change direction as the institution matures.

Placebo. 500 random permutations are run. The true coefficient (0.015) sits right in the middle of the pseudo distribution. This fits the modest significance in the baseline.

Alternative Independent Variable. The baseline regressor List×Post captures the effect of margin-trading eligibility rather than actual short-selling pressure. To further examine whether real short-selling activity affects auditor behavior, this paper replaces List×Post with ShortBal—defined as ln(1 + short-selling balance), with data sourced from the CSMAR Margin Trading Transaction Details (Annual) table—and reruns the baseline specification. Among treatment-group observations with non-missing short-selling data, approximately 86% have positive short-selling balances. The coefficient on ShortBal is positive but statistically insignificant ($p > 0.1$). This finding indicates that auditors' response to margin-trading eligibility is not driven by the actual volume of short-selling transactions but rather by the ex ante risk expectations embedded in the eligibility status itself. Even when a firm has not yet experienced substantial short-selling activity after being included in the designated list, auditors still demand a risk premium based on the perceived threat of potential short selling.

6. Further Analysis

Impact of Marketization. Marketization lags, governance is weaker, litigation risk runs higher—so margin trading's effect on auditors shows up more clearly. Table 2 shows that the coefficient of List×Post×MKT in the audit fee equation is -0.015 ($p<0.01$), indicating that higher marketization weakens the positive effect of margin trading on audit fees-that is, the effect is concentrated in low-marketization regions. The interaction term in the audit report lag equation is insignificant, suggesting the moderating effect primarily operates through the pricing dimension. These results are consistent with Liu [20].

Impact of State Ownership. SOEs face stronger soft budget constraints, while non-SOEs suffer from greater information asymmetry; thus, the impact of margin trading is expected to be more pronounced in non-SOEs. Table 2 shows that the coefficients of List×Post×SOE are -0.054 in the audit fee equation and -0.031 in the audit report lag equation, both highly significant at the 1% level, indicating that the positive effects are concentrated in non-SOEs. For SOEs, the transmission of short selling pressure to auditor behavior is partially blocked by political connections and soft budget constraints.

Table 2. Further Analysis

	(1) LnFee	(2) LnFee	(3) LnDelay	(4) LnDelay
List×Post	0.018** (0.009)	0.037*** (0.010)	0.007 (0.005)	0.019*** (0.005)
List×Post×MKT	-0.015*** (0.005)		-0.003 (0.002)	
List×Post×SOE		-0.054*** (0.017)		-0.031*** (0.008)
Size	0.347*** (0.011)	0.344*** (0.011)	0.049*** (0.005)	0.047*** (0.005)
Lev	-0.033 (0.034)	-0.032 (0.033)	-0.062*** (0.018)	-0.060*** (0.018)
ROA	-0.160** (0.069)	-0.151** (0.069)	-0.504*** (0.039)	-0.503*** (0.039)
Loss	0.059*** (0.008)	0.060*** (0.008)	0.017*** (0.005)	0.017*** (0.005)

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Big4	0.347*** (0.036)	0.346*** (0.036)	-0.027** (0.013)	-0.027** (0.013)
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
N	38,568	38,568	38,568	38,568
Adj. R^2	0.713	0.713	0.164	0.165

7. Conclusions and Implications

Using the phased expansion of China's margin-trading program, this paper looks at how short-selling pressure affects three auditor decisions. Audit fees rise slightly—about 1.5%, marginally significant. Audit report lag and audit opinions show no robust changes. PSM-DID matching is done. All three outcomes become significant afterward, but the economic magnitudes stay small. The sample window is shortened. The fee effect turns negative. This suggests that its direction may shift with the institutional stage. Marketization and state ownership both weaken the short-selling effect. The pattern is clearer in less developed regions and non-state firms. These results suggest something straightforward: institutional context matters. Governance structure matters. They shape how margin-trading eligibility affects auditor behavior. The evidence points toward a few policy priorities. A stronger legal framework for margin trading. Lower short-selling costs. Sharper auditor risk sensitivity. Further market-oriented reforms.

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