

# The Impact of Short-Selling System on the Disclosure of Key Audit Matters

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## ABSTRACT

This study asks whether the introduction of short-selling changes the way auditors report Key Audit Matters. Using the phased expansion of China's margin-trading pilot after 2010 as a natural experiment, we apply a staggered difference-in-differences design to A-share listed firms from 2017 to 2021. Our results show that after a firm becomes eligible for short-selling, the textual similarity of its KAM disclosures to industry peers declines significantly. That decline suggests a move away from boilerplate language and toward more firm-specific, informative narratives. The effect survives parallel-trend checks and placebo tests. We further find that the improvement is driven by firms located in provinces with stronger market institutions and, notably, by clients of non-Big-4 auditors. The pattern points to consistent with a possible channel: external market pressure directly shapes auditors' disclosure decisions. Our evidence adds to the literature on short-selling's governance role and on what drives KAM quality. For policy, the findings argue for continuing capital-market liberalisation, tighter oversight of disclosure practices, and targeted support for smaller audit firms.

**Keywords:** Short-Selling System; Key Audit Matters (KAM); Marketisation; Non-Big-4 Audit; Staggered DID

## 1. INTRODUCTION

Short-selling—whereby investors borrow shares, sell them, and aim to repurchase at a lower price—has been a mainstay of developed equity markets for decades. In China, this tool arrived on 31 March 2010, when the securities regulator launched a margin-trading pilot that ended the A-share market's longstanding ban on short positions. By November 2011, the pilot had been made permanent.

Yet the influence of short-selling is unlikely to be confined to price movements. Once investors acquire the ability to bet against a firm, they have greater motivation to search for adverse information. That scrutiny naturally spills over into financial reporting and, by extension, into auditing. Audit firms, conscious that their outputs might draw short-sellers' attention, face incentives to bolster their disclosures. The Key Audit Matters section of the audit report—where auditors itemise the issues they judged most significant for that engagement—is a natural place to look for such changes. The usefulness of the entire audit report hinges on whether these KAMs actually convey substantive information.

What determines KAM quality, however, remains an open question. Some companies treat the KAM requirement as a routine compliance task, drafting text that closely copies what their industry counterparts are saying. Others go further, adapting the content to their own specific circumstances. Our objective is to establish which tendency prevails—and whether external forces such as short-selling push firms in one direction or the other.

The current literature offers only piecemeal answers. Studies from outside China have documented that short-selling pressure raises auditors' perceived risk and extends audit effort, but very few have trained their lens specifically on KAM disclosures. Domestic research has noted a positive correlation between short-selling activity and the richness of disclosures, yet the analysis often stops at simple correlations rather than establishing causality. Heterogeneity—namely, how the effect may differ across contexts—has attracted even less scrutiny. We tackle these gaps by exploiting the phased expansion of eligible stocks in China's margin-trading programme. This setting provides variation in treatment timing, enabling us to isolate the causal impact of making short-selling available.

We consider two sources of heterogeneity particularly worth exploring. The first is the degree of regional marketisation, which captures differences in legal enforcement, analyst coverage, and media oversight across provinces. The second is auditor size, since Big-4 firms face reputational incentives that differ from those of smaller practitioners. We investigate both dimensions.

## 2. THEORETICAL ANALYSIS AND HYPOTHESIS DEVELOPMENT

### 2.1 Short-Selling and Key Audit Matter Disclosures

Why should short-selling affect KAM disclosure quality? The reasoning operates through two layers: the corporate level and the auditor level.

At the corporate level, short-selling establishes a governance channel that incentivises transparency and penalises opacity. When a firm's shares become available for shorting, a set of investors emerges with a direct financial stake in detecting adverse information. This alters management's cost-benefit calculus: concealing unfavourable news becomes more costly because other market participants are now motivated to expose it. Prior empirical work indicates that short-selling availability curbs disclosure violations and enhances overall financial reporting reliability. These are not trivial by-products; they point to a genuine disciplinary function. With more dependable public financial data, auditors can base their work on a sounder foundation—they can verify figures with greater ease and flag inconsistencies more quickly.

Turning to the auditor side, the pressure is more immediate. Huang and Huang (2016)<sup>[1]</sup> show that short-selling heightens auditors' exposure to litigation. When negative news drives stock prices downward, investors naturally look for a party to blame, and auditors are an obvious target. Chen and Guan (2018)<sup>[6]</sup> add that audit fees rise alongside short-selling activity, consistent with auditors devoting extra hours. There is also evidence of greater regulatory attention—sanctions against targeted firms become more probable. Confronted with these risks, auditors have both professional and financial reasons to exercise greater care. One manifestation of this heightened care is more detailed and specific KAM disclosures. Rezaee and Homaoun (2024)<sup>[2]</sup> make a complementary observation: informed traders, short-sellers included, do attend to KAMs because these disclosures carry value-relevant content. Auditors who appreciate this dynamic are unlikely to treat KAMs as a routine formality.

Synthesising these points yields our first formal hypothesis:

H1: The short-selling mechanism can enhance the quality of corporate key audit matter disclosures.

### 2.2 Heterogeneity Research on Short-Selling and Key Audit Matters

We do not expect the effect to be uniform. Two moderating factors seem particularly likely to matter.

#### 2.2.1 Short-Selling, Marketisation Differences, and KAM Disclosure Quality

The effectiveness of short-selling pressure depends critically on the surrounding institutional environment. In regions with well-functioning market institutions—effective legal systems, active analyst communities, and robust media oversight—the negative signals that short-sellers generate can be rapidly incorporated into prices and into management's decision-making. Firms in these settings have strong incentives to preempt criticism by producing KAM disclosures that are transparent and substantive. That is the favourable scenario.

The unfavourable scenario unfolds in regions where marketisation is weaker. There, relational contracting and government intervention tend to play larger roles. The very same short-selling signal that would trigger a governance response in a more developed setting may be dulled or completely disregarded. Some firms in these regions, particularly those with weak internal controls, may even choose smaller local auditors who are more accommodating—paying elevated fees in exchange for smoother opinions (Xu et al., 2014)<sup>[5]</sup>. Those auditors, in turn, have little incentive to demand better KAMs, because their clients value simplicity over substance.

This reasoning implies that the effect we examine is not context-independent. It should be amplified where institutions reinforce the pressure and attenuated where they dampen it. Accordingly:

H2: The positive effect of short-selling on KAM disclosure quality is stronger in regions with higher marketisation than in regions with lower marketisation.

#### 2.2.2 Short-Selling, Auditor Size, and KAM Disclosure Quality

Auditor size is another factor likely to produce differential responses. DeAngelo (1981)<sup>[3]</sup> articulated the classic argument: larger auditors have more reputation capital at stake and therefore invest more heavily in quality assurance. Big-4 firms are commonly perceived as delivering superior audit quality, and that perception extends to their KAM disclosures. Where the literature leaves more room for debate is how short-selling interacts with this size distinction.

Our reading of the available evidence suggests that non-Big-4 firms have greater scope for improvement once short-selling pressure arrives. Big-4 firms are already operating close to a high standard, so the marginal return from additional effort is relatively modest. Moreover, their response to litigation risk appears to be channelled through pricing rather than process—Huang and Huang (2016) <sup>[1]</sup> find that Big-4 firms raise audit fees more sharply in reaction to short-selling, which is consistent with a strategy of covering risk through compensation rather than altering procedures. Non-Big-4 firms cannot readily follow that route. They lack both the pricing power and the reputational buffer. When short-selling pressure intensifies, their only practical response is to change what they actually do and how they report it. Wang et al. (2024) <sup>[4]</sup> offer supporting evidence that the effect of short-selling on KAM quality is indeed more pronounced for non-Big-4 clients.

These considerations point to our third hypothesis:

H3: All else equal, the short-selling mechanism has a stronger positive effect on KAM disclosure quality for firms audited by non-Big-4 accounting firms.

### 3. RESEARCH DESIGN

#### 3.1 Sample Selection and Data Sources

Because the auditing standards mandating KAM disclosures came into effect in 2017, we confine our sample period to 2017–2021. Our starting sample comprises all A-share listed companies. We then impose several filters: (1) we drop ST and \*ST firms; (2) we exclude financial-sector firms; (3) we remove observations with missing values for any of the variables used in the regression; and (4) we winsorise all continuous variables at the 1st and 99th percentiles to mitigate the influence of outliers.

#### 3.2 Model Specification and Variable Definitions

Our identification relies on the staggered addition of stocks to the margin-trading eligible list. Since eligibility is based on exchange criteria rather than random assignment, we use a staggered difference-in-differences design. The regression is:

$$KAM_{i,t} = \beta_0 + \beta_1 DID_{i,t} + \beta_2 ROA_{i,t} + \beta_3 REC_{i,t} + \beta_4 INV_{i,t} + \beta_5 CurrRatio_{i,t} + \beta_6 LEV_{i,t} + \mu_i + \lambda_t + \varepsilon_{i,t} \quad (1)$$

Our dependent variable—KAM quality—is captured by textual similarity. Using the WinGo index, we compute the similarity between each firm’s KAM text and the average KAM text of other firms in the same industry and year. Higher similarity means more boilerplate and thus lower quality.

In this paper, the DID term is constructed as the interaction of Short and Post. Its coefficient captures the net effect of the relaxation of short-selling constraints on the disclosure quality of key audit matters, and its sign and statistical significance constitute the core focus of this study. Short is a dummy variable indicating whether a firm is eligible for short selling; it takes a value of 1 if the firm is a short-selling target stock, and 0 otherwise. Post is another dummy variable marking the timing of short-selling eligibility: it equals 1 for all years after the firm is included in the short-selling list (excluding the year of inclusion itself), and 0 for all prior years.

We include a set of controls that could independently affect KAM disclosure choices. These are defined in Table 1, which also summarises all variables used.

Table 1. Variable Definitions

| Variable Type    | Variable Name          | Symbol | Definition                                                            |
|------------------|------------------------|--------|-----------------------------------------------------------------------|
| Dependent        | KAM disclosure quality | SM     | Similarity of KAM text with same-industry peers in the same period    |
| Core explanatory | DID                    | DID    | Treat × Post, indicates whether the firm is affected by short-selling |
| Treatment        | Treat                  | Treat  | 1 if the firm is eligible for margin trading, 0 otherwise             |
| Time             | Post                   | Post   | 1 for years after inclusion, 0 otherwise                              |
| Control          | ROA                    | ROA    | Net income / total assets                                             |
| Control          | REC                    | REC    | Accounts receivable / total assets                                    |

Table 1. (continued) Variable Definitions

| Variable Type | Variable Name | Symbol      | Definition                                   |
|---------------|---------------|-------------|----------------------------------------------|
| Control       | INV           | INV         | Inventory / total assets                     |
| Control       | CurrRatio     | CurrRatio   | Current assets / current liabilities         |
| Control       | LEV           | LEV         | Total liabilities / total assets             |
| Grouping      | Big4          | Big4        | 1 if audited by a Big 4 firm, 0 otherwise    |
| Grouping      | MarketIndex   | MarketIndex | 1 if above-median marketization, 0 otherwise |

## 4. EMPIRICAL ANALYSIS

### 4.1 Descriptive Statistics

KAM similarity varies considerably across firms. The mean of *sm\_num* is 0.592, with a standard deviation of 0.119, ranging from 0.192 to 0.756. That spread shows that some firms produce KAM text that closely tracks their peers, while others deviate sharply. Table 2 gives the full summary.

Table 2. Descriptive Statistics

| VarName            | Obs    | Mean  | SD    | Min    | Median | Max    |
|--------------------|--------|-------|-------|--------|--------|--------|
| marketizationindex | 19,542 | 0.846 | 0.361 | 0.000  | 1.000  | 1.000  |
| roa                | 19,542 | 0.010 | 0.014 | -0.025 | 0.007  | 0.064  |
| rec                | 19,542 | 0.127 | 0.103 | 0.001  | 0.106  | 0.466  |
| lnv                | 19,542 | 0.127 | 0.102 | 0.001  | 0.106  | 0.460  |
| curratio           | 19,542 | 2.223 | 1.842 | 0.365  | 1.651  | 11.375 |
| lev                | 19,542 | 0.796 | 0.044 | 0.732  | 0.797  | 0.846  |
| treat              | 19,542 | 0.403 | 0.491 | 0.000  | 0.000  | 1.000  |
| did                | 19,542 | 0.237 | 0.425 | 0.000  | 0.000  | 1.000  |
| sm_num             | 19,478 | 0.592 | 0.119 | 0.192  | 0.625  | 0.756  |

### 4.2 Parallel Trends Test

Before relying on the DID estimates, we check the parallel-trend assumption. Figure 1 plots the coefficients from an event-study specification:

$$KAM_{i,t} = \beta_0 + \sum_{k=-3}^{-1} \beta_k \cdot Treat_i \times Pre_{k,i,t} + \sum_{k=0}^3 \beta_k \cdot Treat_i \times Post_{k,i,t} + \gamma \cdot Controls_{i,t} + \mu_i + \lambda_t + \varepsilon_{i,t} \quad (2)$$

The coefficients for periods -3 and -2 (pre-treatment) are small and statistically insignificant—reassuringly, there is no sign that firms on the treatment track were already diverging before short-selling became available. The post-treatment coefficients, in contrast, are negative and grow larger over time, implying a cumulative effect.

### 4.3 Baseline Regression Results

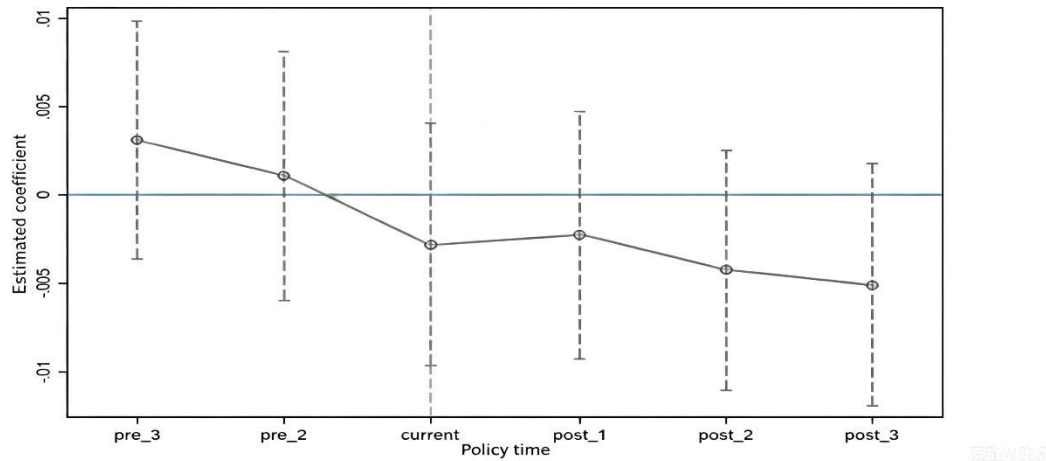


Figure 1. Parallel Trends Test

Table 3 presents the main findings. Column (1) includes only the DID term with firm and year fixed effects; column (2) adds all controls. The DID coefficient is -0.005 in both columns, significant at the 5% level. Because a higher *sm\_num* signals greater similarity—i.e., lower quality—the negative coefficient means that short-selling reduces similarity and thus improves KAM quality. This supports H1.

The magnitude is modest but non-negligible: about 0.005 standard deviations, or 0.8% of the sample mean. Given that roughly 23.7% of observations are treated, the effect translates into a meaningful improvement for the affected firms.

Among controls, inventory ratio (*lnv*) shows a positive association with similarity (0.071,  $p < 0.01$ ). One plausible interpretation is that inventory audits follow fairly standard procedures, so firms with larger inventories tend to write KAMs that look like those of their peers. Leverage (*lev*) has the opposite sign (-0.053,  $p < 0.01$ ), suggesting that riskier firms provide more differentiated disclosures—perhaps to reassure stakeholders about their solvency. Other controls are not significant at conventional levels, but their signs are in line with expectations. The model explains about 69% of within-firm variation, which is acceptable for this kind of analysis.

Table 3. Baseline Regression Results: Short-Selling and KAM Quality

| VARIABLES | (1) Model 1 | (2) Model 2 |
|-----------|-------------|-------------|
| Did       | -0.005**    | -0.005**    |
| (-2.36)   | (-2.10)     |             |
| Roa       |             | -0.075      |
| (-1.21)   |             |             |
| Rec       |             | -0.020      |
| (-1.30)   |             |             |
| Lnv       |             | 0.071***    |
| (3.66)    |             |             |
| Curratio  |             | -0.001      |
| (-1.19)   |             |             |

Table 3. (continued) Baseline Regression Results: Short-Selling and KAM Quality

| VARIABLES             | (1) Model 1 | (2) Model 2 |
|-----------------------|-------------|-------------|
| Lev                   |             | -0.053***   |
| (-2.67)               |             |             |
| Constant              | 0.593***    | 0.631***    |
| (805.48)              | (39.78)     |             |
| Observations          | 19,477      | 19,477      |
| R <sup>2</sup>        | 0.686       | 0.686       |
| Firm fe               | yes         | yes         |
| Year fe               | yes         | yes         |
| Within R <sup>2</sup> | 0.000346    | 0.00196     |

Note: t-statistics in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

#### 4.3.1 Heterogeneity Analysis: Marketisation

We argued earlier that the baseline effect should be stronger in more marketised regions. To test that, we split the sample at the median marketisation index. Table 4 shows the results.

In the high-marketisation subsample, the DID coefficient is -0.012 and significant at the 10% level. In the low-marketisation subsample, it is -0.003 and insignificant. The contrast is economically meaningful and consistent with H2. The pattern confirms that short-selling pressure works better as a governance device when institutional support is strong.

Table 4. Heterogeneity by Marketisation

| Variables      | (1) High Marketization<br>(1) | (2) Low Marketization<br>(2) |
|----------------|-------------------------------|------------------------------|
| Did            | -0.012*<br>(-1.85)            | -0.003<br>(-1.37)            |
| Roa            | 0.331*<br>(1.95)              | -0.173***<br>(-2.63)         |
| Rec            | -0.179**<br>(-2.46)           | -0.007<br>(-0.48)            |
| Lnv            | 0.262***<br>(3.29)            | 0.050**<br>(2.51)            |
| Curratio       | -0.002<br>(-1.01)             | -0.000<br>(-0.21)            |
| Lev            | -0.106*<br>(-1.72)            | -0.041**<br>(-1.99)          |
| Constant       | 0.648***<br>(13.11)           | 0.626***<br>(37.67)          |
| Observations   | 2,990                         | 16,483                       |
| R <sup>2</sup> | 0.657                         | 0.692                        |
| Firm FE        | YES                           | YES                          |

Table 4. (continued) Heterogeneity by Marketisation

| Variables             | (1) High Marketization | (2) Low Marketization |
|-----------------------|------------------------|-----------------------|
|                       | (1)                    | (2)                   |
| Year FE               | YES                    | YES                   |
| Within R <sup>2</sup> | 0.0106                 | 0.00163               |

### 4.3.2 Heterogeneity Analysis: Big4 Audit

The second heterogeneity dimension is auditor size. Table 5 reveals a clear split. For non-Big-4 clients, the DID coefficient is -0.005 and significant at the 5% level. For Big-4 clients, the coefficient is 0.001 and not significant. This divergence supports H3.

Why the difference? Big-4 firms start from a higher baseline, leaving little room for improvement. Also, when short-selling pressure rises, Big-4 firms appear to respond mainly by raising audit fees, not by rewriting KAMs—a strategy that smaller auditors cannot easily adopt. Non-Big-4 firms, lacking fee-setting power and a reputational buffer, have no choice but to adjust their procedures and disclosure content. This interpretation aligns with Wang et al. (2024) <sup>[4]</sup>.

Table 5. Heterogeneity by Big4 Audit

| VARIABLES             | (1) Non-Big 4       | (2) Big 4          |
|-----------------------|---------------------|--------------------|
| Did                   | -0.005**<br>(-2.41) | 0.001<br>(0.10)    |
| Roa                   | -0.122*<br>(-1.94)  | 0.407<br>(1.59)    |
| Rec                   | -0.024<br>(-1.52)   | 0.077<br>(1.11)    |
| Lnv                   | 0.079***<br>(4.08)  | -0.003<br>(-0.02)  |
| Curratio              | -0.001<br>(-1.23)   | 0.007<br>(1.52)    |
| Lev                   | -0.050**<br>(-2.49) | -0.091<br>(-1.09)  |
| Constant              | 0.632***<br>(38.83) | 0.587***<br>(8.75) |
| Observations          | 18,375              | 1,069              |
| R <sup>2</sup>        | 0.686               | 0.803              |
| Firm FE               | YES                 | YES                |
| Year FE               | YES                 | YES                |
| Within R <sup>2</sup> | 0.00253             | 0.0102             |

### 4.4 Robustness: Placebo Test

To rule out the concern that our findings might be driven by unobserved confounding factors rather than short-selling itself, we implement a placebo test. Following La Ferrara et al. (2012) and Chetty et al. (2009) <sup>[7] [8]</sup>, we randomly reassign treatment status—assigning each firm a pseudo-eligibility date—and re-estimate the model. We repeat this procedure 500 times.

Table 6 presents the distribution of false DID coefficients derived from the placebo test. The results show that the median of false DID coefficients from random treatment assignments is 0.000, with a mean close to zero (0.0005) and a standard deviation of 0.0019. In terms of percentiles, the 25th percentile equals -0.001, the 75th percentile equals 0.001, and the 90th percentile is approximately 0.002, indicating that the false coefficients are symmetrically distributed around zero. The true DID estimate from the baseline regression is -0.005, which lies in the lower tail of the distribution of false coefficients (roughly at the 2nd percentile) and deviates substantially from the randomly estimated coefficients. This evidence suggests that the positive effect of short selling mechanisms on the disclosure quality of key audit matters identified in the baseline regression is not driven by random noise or omitted variables, and the baseline findings for Hypothesis H1 are robust.

The distribution of the resulting pseudo DID coefficients is centred around zero, with a mean of 0.0005 and a standard deviation of 0.0019. Our actual estimate of -0.005 falls near the 2nd percentile of this distribution. Figure 2 displays the kernel density plot: the pseudo coefficients cluster tightly around zero, whereas the true estimate sits well to the left. Not a single one of the 500 random assignments produces a coefficient as negative as ours. This outcome gives us strong confidence that our main result is not a statistical artefact.

Table 6. Placebo Test: Distribution of False DID Coefficients

| Statistic       | False DID Coefficient |
|-----------------|-----------------------|
| Mean            | 0.0005                |
| Std. Dev.       | 0.0019                |
| Minimum         | -0.004                |
| 10th Percentile | -0.002                |
| 25th Percentile | -0.001                |
| Median          | 0.000                 |
| 75th Percentile | 0.001                 |
| 90th Percentile | 0.002                 |
| Maximum         | 0.004                 |
| True Estimate   | -0.005                |

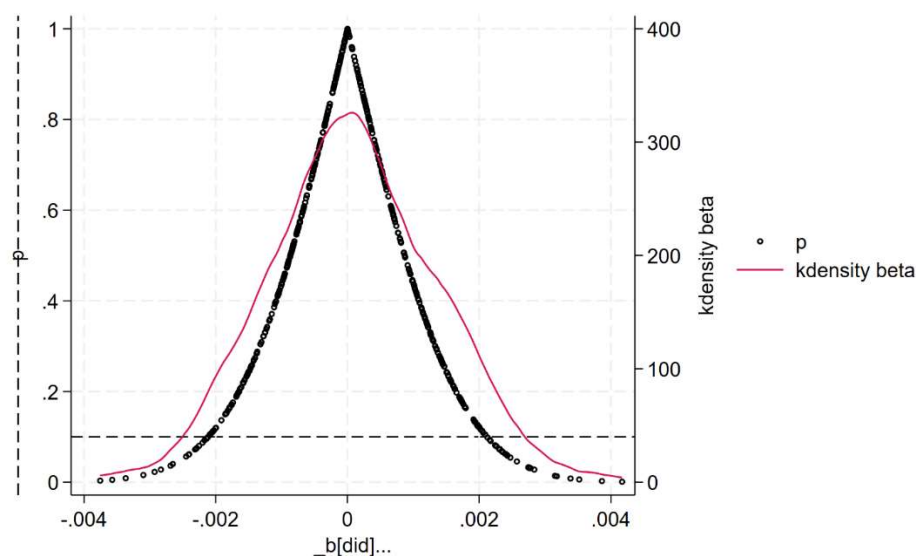


Figure 2. Placebo Test (500 Randomizations)

## 5. CONCLUSION AND POLICY IMPLICATIONS

To summarise our findings: by exploiting the staggered expansion of China's margin-trading programme as an identification device, and applying a staggered DID framework to A-share data from 2017 to 2021, we have demonstrated that making short-selling available improves the quality of KAM disclosures. The effect is not large in absolute magnitude, but it is robust and it grows stronger over time. We have also shown that the effect is heterogeneous: it is concentrated in provinces with higher levels of marketisation and among clients of non-Big-4 auditors.

These results carry implications for both scholarship and policymaking.

On the research front, they add to the accumulating evidence that short-selling has real consequences beyond the realm of price discovery. The transmission mechanism we have uncovered—linking external market pressure through auditor behaviour to disclosure outcomes—suggests that short-selling's governance function extends into the audit arena. This is a channel that the existing literature has largely overlooked.

On the policy side, several lessons stand out. First, regulators would do well to view the margin-trading eligible list not solely as a financial-market instrument, but also as a governance tool with spill-over benefits for disclosure quality. Expanding the list of eligible stocks may yield advantages that go beyond improving price efficiency. Second, the regional heterogeneity we observe underscores the importance of complementary institutional development—stronger legal enforcement, more active market monitoring—for the success of market-based governance mechanisms. Third, the fact that non-Big-4 clients drive our main results suggests that these firms and their auditors are particularly sensitive to external pressure. This group might deserve policy attention not as a problem to be remedied, but as an opportunity—a market segment where governance interventions can generate especially high returns.

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