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Industry and Regional Spillover Effects of Penalties for Disclosure Noncompliance among Public Firms

Cheng Wang*, Weisen Kong

School of Economics and Management, Qiqihar University, 161003 Qiqihar, China

* Correspondence: Cheng Wang (wangcheng@qqhru.edu.cn)

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Abstract: This study investigates the industry-wide and regional spillover effects of penalties for noncompliance with information disclosure regulations, focusing on publicly listed firms in China. The analysis is based on panel data from Chinese listed companies, revealing that penalties imposed by the China Securities Regulatory Commission (CSRC) on noncompliant firms lead to significant improvements in the quality of information disclosure by other firms in the same industry or geographical region that were not subject to penalties. These spillover effects are found to be contingent on factors such as the competitive dynamics within the industry and the level of regional economic development. Furthermore, the results indicate that the impact of penalties on neighbouring firms is amplified when the publication cycle for penalty announcements is shorter, though the effect diminishes over time as the information becomes less salient. These findings contribute to the understanding of regulatory enforcement mechanisms and their broader influence on corporate transparency, highlighting the role of both industry and regional contexts in shaping compliance behaviour.

Keywords: China; Industries; Information disclosure quality; Noncompliance penalties; Regions; Spillover effects

JEL Classification: M40; G32; G34

1. Introduction

The 20th National Congress of the CPC emphasized the importance of strengthening financial regulatory frameworks and improving corporate disclosure standards among public firms. However, despite the Chinese capital market's pursuit of high-quality growth, instances of non-compliant information disclosure remain prevalent, posing significant risks to the market's healthy development. In 2023, the CSRC investigated 717 cases, of which 244 involved disclosure violations, accounting for 34%—a clear indication of the severity of the issue. To address this challenge, the CSRC has intensified investigations and efforts to improve market integrity. Notably, in May 2024, Evergrande Real Estate Company was fined 4.175 billion yuan by the CSRC for severe disclosure violations. This penalty not only served as a direct deterrent to the offending firm but also conveyed the CSRC's zero-tolerance stance on such infractions to the broader market. Against this backdrop, an important question arises: Can the punishment of Evergrande Real Estate and similar cases trigger positive spillover effects, improving compliance among other firms in the same industry or region? Addressing this question is vital to understanding the self-regulation mechanisms of the capital market and holds significant implications for the development and implementation of regulatory policies. The spillover effect refers to the phenomenon where regulatory penalties, as exogenous shocks to a company, not only deter the violator's own misconduct but also impact other companies (Meng & Lu, 2024). For example, following the Evergrande Real Estate case, the CSRC further intensified its supervision of listed companies in the real estate industry, strictly cracking down on violations such as false information disclosure by listed real estate firms. This demonstrates the spillover effect of penalties at the industry level.

Deterrence Theory suggests that market entities evaluate the potential benefits and costs of penalties before

committing violations. Regulatory punishments heighten this cost-benefit consideration, motivating enterprises to proactively avoid noncompliance (Cesare, 2014). Existing literature indicates that measures such as auditor penalties and IPO on-site inspections have significant governance effects on unpunished firms within the same industry or region (Liu et al., 2019; Zhou & Zeng, 2024). However, in the domain of information disclosure regulation, prior studies have primarily focused on the direct governance effects and economic consequences of violations and their associated penalties (Huang & Wu, 2013; Liu & Chen, 2018; Wu & Zou, 2022; Yu & Yan, 2021). Research addressing the spillover effects of these penalties—particularly in terms of how they influence information disclosure quality—remains relatively scarce. Specifically, the mechanisms through which spillover effects propagate at the industry and regional levels, as well as their scope and duration, warrant further empirical investigation and discussion. To bridge this research gap, this paper undertakes an in-depth exploration of the spillover effects of penalties for information disclosure noncompliance within the same industry and region. This study aims to provide fresh insights and empirical evidence to enhance the supervision and governance of the capital market, thereby fostering its high-quality development.

The potential contributions of this paper are threefold. First, it enriches the literature on the governance effects of penalties for information disclosure violations. Unlike prior studies that predominantly focus on the direct impact of penalties on the offending firms, this research adopts a novel perspective by analyzing the spillover effects of these penalties on the information disclosure quality of unpunished firms. This approach adds a new dimension to the study of governance effects related to regulatory penalties. Second, the paper expands the scope of research on mechanisms for managing information disclosure quality. While existing studies often emphasize the direct influence of internal and external governance on disclosure quality, this study explores the positive spillover effects of regulatory penalties, providing a fresh avenue for investigation in this area. Lastly, this paper offers both academic and practical value by providing empirical evidence for policymakers and market regulators. By uncovering the spillover effects of penalties for disclosure violations, it highlights the pivotal role of enhanced supervision and law enforcement in fostering transparency and fairness in capital markets. These insights can help regulatory authorities design more precise and effective policies, ultimately contributing to the long-term stability and healthy development of the market.

2. Literature Review and Hypothesis

2.1 Spillover Effect of Punishment for Information Disclosure Violations

The transition from “managing a case” to “governing a sector” encapsulates the spillover effect of penalties for information disclosure violations. Drawing from the historical practice of “making an example” in Chinese history and the rule-of-law principles embedded in Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, both contexts underscore the rationale behind the spillover effect of such penalties. Grounded in Deterrence Theory, the spillover effect arises from the effective deterrent impact of regulatory actions. This theory emphasizes three critical components: the capacity of regulators to identify and penalize violations, the determination to enforce legal and regulatory frameworks, and the transparent communication of such actions to market participants. When regulatory authorities impose severe penalties and publicly disclose the details of these violations, the behavior of the violators is directly corrected. Moreover, the deterrent effect extends to other companies, which, motivated by the fear of facing similar penalties, become more inclined to enhance their compliance and improve their information disclosure practices.

In the field of listed company regulation, scholars have conducted extensive research on the spillover effects of regulatory penalties.

On one hand, existing literature primarily focuses on the spillover effects of regulatory penalties on firms with explicit relational ties. These ties are often built through contractual and business relationships, including audit linkages formed through audit contracts and business relationships, executive and director linkages formed through employment contracts, and lending linkages formed through loan contracts and business dealings. These social networks form the pathways for the transmission of regulatory spillover effects. For example, when an accounting firm conducting annual audits receives a regulatory inquiry, it tends to increase the similarity between the key audit matters issued to other clients and the inquiry’s content to mitigate potential regulatory risks (Jiang et al., 2024). Similarly, when IPO firms are subject to random on-site inspections by the CSRC, the regulatory effect can spill over through audit linkages to other unchecked firms, improving the audit quality of linked firms (Zhou & Zeng, 2024). Penalties imposed on banks can significantly improve the information disclosure quality of borrowing firms, indicating a significant spillover effect on information quality (Gui & Wen, 2024). Furthermore, when auditors who previously collaborated with penalized auditors move to other firms, their audit quality tends to be relatively higher, demonstrating cross-firm spillover effects of administrative penalties (Liao & Feng, 2023). The release of industry-specific information disclosure guidelines has also been shown to significantly increase audit fees for affected firms (Li et al., 2022). Additionally, when a company is penalized for information disclosure violations, analysts’ earnings forecast accuracy for firms with interlocking directors significantly declines (Ding

et al., 2022).

On the other hand, beyond the strong relational ties formed through contractual and business relationships, listed companies and firms within the same industry or region also maintain latent social network relationships through industry and regional connections. These latent networks similarly facilitate the transmission and realization of spillover effects. Existing research has primarily explored the spillover effects within the same industry or region from the perspectives of corporate innovation, environmental initiatives, and technological advancement (Evans et al., 2018; Ke et al., 2023). However, studies on the spillover effects of penalties for information disclosure violations within industries and regions remain relatively scarce. Although Mei et al. (2021) examined the spillover effects of regulatory inquiries on industries and regions from the perspective of earnings management, their research did not fully reveal the specific mechanisms through which penalties for information disclosure violations influence the disclosure quality of unpenalized firms within industries and regions. Furthermore, most existing studies focus on a single dimension (e.g., industry or region) while overlooking the specific mechanisms driving the spillover effects of penalties for information disclosure violations (Dai et al., 2023). A review of the literature indicates that in-depth research exploring changes in the disclosure quality of unpenalized listed companies from both industry and regional perspectives remains insufficient. This gap provides a basis for the present study to address this issue.

Public firms within the same industry are closely connected and interdependent. Companies in the same sector often share similar business models, face the same regulatory framework, and attract comparable investor groups. As a result, the behavior of public firms is influenced by the actions of other companies in the same industry. Studies have shown that factors such as investments in research and development (Xie et al., 2023), technology upgrades (Cheng et al., 2023), patent output (Zhang et al., 2010), corporate social responsibility (Zheng & Huang, 2018), and executive compensation plans (Kieschnick & Shi, 2023) are all affected by the behavior of other firms in the industry. Similarly, the information disclosure practices of public firms are influenced by other listed companies in the same industry (Fu et al., 2023; Li et al., 2022). The industry spillover effect of penalties for information disclosure violations can be analyzed from two perspectives: information dissemination and external supervision. From the perspective of information dissemination, when a listed company is penalized for information disclosure violations, the news spreads rapidly through industry reports, professional media, seminars, and other channels, serving as a wake-up call for the industry. Other firms in the sector quickly learn about the severe consequences of such violations. From the perspective of external supervision, regulators often compare the financial indicators and operational conditions of companies within the same industry when reviewing their information disclosure. If a firm is penalized for violations, regulators may use this case to scrutinize other companies in the industry more closely, increasing the likelihood of detecting similar illegal activities. Aware of the deterrent and exposure risks associated with penalties, public firms are more likely to take proactive steps to avoid similar penalties and improve their compliance with information disclosure requirements.

Public firms in the same region are also closely connected through social networks and relationships. In specific regions, companies are interlinked via networks such as chambers of commerce and industry associations. As a result, the behavior of public firms is influenced by other companies within the same region. Studies have shown that factors such as corporate payroll plans (Cai et al., 2016), technological progress (Tang & Li, 2022), innovation activities (Wang & Wang, 2022), overseas mergers and acquisitions (Wei et al., 2023), and tax burden pressures (Dai et al., 2023) are shaped by the actions of other firms in the region. Similarly, the information disclosure practices of public firms are influenced by other companies in the same region (Mei et al., 2021). The regional spillover effect of penalties for information disclosure violations can be analyzed from the perspectives of information dissemination and external supervision. From the standpoint of information dissemination, when a firm is penalized for violating disclosure regulations, this information quickly circulates among other firms in the region through executive social events, social media discussions, and other local networks. As a result, the event and its consequences become a focal point within the social circles of regional executives, significantly raising compliance awareness among other enterprises. From the perspective of external supervision, unlike stock exchanges that regulate based on industry classification, local regulators enforce oversight based on geographic jurisdiction. When a company is penalized, local regulators (including the CSRC and local financial regulatory bureaus) often intensify their scrutiny of other firms in the region, increasing the likelihood of detecting violations. This “neighborhood effect” makes public firms more likely to enhance their compliance with information disclosure requirements to avoid similar penalties after observing other firms in the region being sanctioned.

Based on the theoretical framework and empirical evidence discussed above, the following hypotheses are proposed:

H1: When a listed company in the same industry is penalized for information disclosure violations, the quality of information disclosure among other public firms in the industry will improve in the subsequent fiscal year.

H2: When a listed company in the same region is penalized for information disclosure violations, the quality of information disclosure among other public firms in the region will improve in the subsequent fiscal year.

2.2 Factors Affecting the Spillover Effect

2.2.1 Degree of industry competition

The level of interaction and competition among listed companies within the same industry is a key factor influencing the spillover effect of penalties for information disclosure violations. According to resource dependence theory, organizations rely on critical external resources, such as investor trust, market share, and capital, which are vital for their survival and growth. This dependence becomes even more pronounced in competitive industries, where firms face heightened pressure to secure and sustain these resources to maintain their market position and competitive advantage (Shang & Wu, 2022; Yang et al., 2024). In highly competitive industries, the scarcity of resources makes listed companies more sensitive to regulatory penalties, as they seek to avoid potential trust crises or capital withdrawal. Moreover, compared to industries with lower competition, information dissemination occurs more rapidly in highly competitive industries. These industries often have well-established industry associations, forums, and diverse communication channels, which accelerate the transmission of spillover effects from penalties for information disclosure violations. As a result, these companies are more likely to improve the quality of their information disclosure. This dynamic amplifies the spillover effect of the penalty, leading to a broader improvement in the overall quality of information disclosure within the industry. Based on the above theoretical framework and empirical evidence, the following hypothesis is proposed:

H3: The higher the degree of industry competition, the more significant the industry spillover effect.

2.2.2 Level of regional development

Geographically clustered companies within the same region share similar environments and networks, enabling the spillover effects of regulatory penalties as firms learn from peers' penalties and adjust their practices. Regional development levels, however, moderate the strength of this effect. According to institutional theory, organizational behavior is strongly shaped by the external institutional environment, including formal rules, norms, and cognitive frameworks. Regions with higher levels of economic development are characterized by mature legal systems, stringent regulatory frameworks, and robust financial markets (Shen & Feng, 2012; Zhang & Jiang, 2013). These features enhance the responsiveness of firms to regulatory signals, enabling them to quickly internalize lessons from penalties and improve compliance. Furthermore, companies in developed regions often have better access to resources, such as advanced management practices and strong corporate governance systems, which further enable them to adopt effective measures for improving information disclosure quality. As a result, the positive spillover effects of penalties are more efficiently absorbed, but the extent of their impact is reduced because firms in these regions are already more compliant with disclosure standards. In contrast, less developed regions often lack strong regulatory and governance systems. Companies in these regions tend to rely more on peer learning and external signals to guide their compliance efforts. When a penalty is imposed on a firm in such regions, the event serves as a stronger wake-up call for other companies, as they are more likely to see the penalty as an opportunity to improve their practices and avoid future risks. Based on the above theoretical framework and empirical research, the following hypothesis is proposed:

H4: The higher the level of regional development, the weaker the regional spillover effect.

The spillover effect and influencing factors of the penalty for information disclosure violations are illustrated in Figure 1.

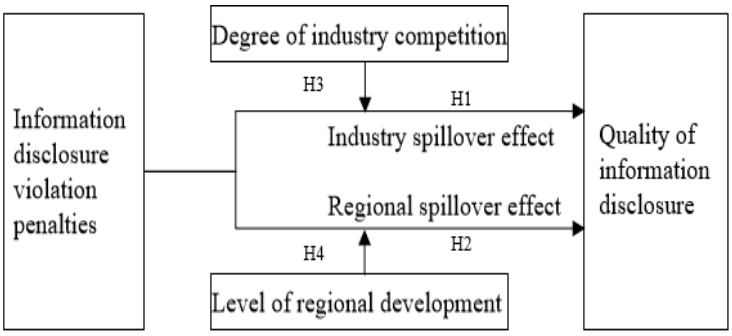

Figure 1. Spillover effect and influencing factors of punishment for information disclosure violations

3. Methods

3.1 Data Sources

This study examines A-share listed companies on the SZSE and SSE from 2003 to 2022. The data span of 2003–2022 was chosen to align with significant regulatory developments and data availability. On 31 January 2004, the

State Council issued the "Nine Opinions," elevating capital market development to a national strategic level and introducing higher standards for information disclosure, effective from the 2003 fiscal year. Including data from 2003 allows the study to capture the initial impact of these enhanced disclosure requirements. The endpoint of 2022 ensures the inclusion of recent trends while maintaining data completeness for analysis. The sample excludes companies in the financial, insurance, and banking industries, as well as any observations with missing data. Financial and insurance sectors were excluded from the sample due to their distinct regulatory frameworks and stricter disclosure requirements, which differ significantly from those of non-financial firms. Including these sectors could introduce heterogeneity and bias the results, reducing the generalizability of findings to non-financial industries. While this exclusion may limit the applicability of conclusions to financial and insurance firms, it ensures a more robust and interpretable analysis for non-financial sectors. After these exclusions, the final dataset includes 31,195 annual-individual-regional observations and 31,177 annual-individual-industry observations. The data were sourced from the CSMAR database and analyzed using Stata 18, Python 3.12, and Excel.

3.2 Variables

3.2.1 Dependent variable

(1) Quality of Information Disclosure (Qua): This study draws on the methodology of Cao & Zhang (2020) and Wang et al. (2022). They use the annual evaluation results of information disclosure by the SZSE and SSE as an index to measure the quality of disclosure among listed companies. Specifically, the SSE began publishing its annual evaluation results for information disclosure in 2018, meaning the sample period for SSE data spans from 2018 to 2022. SSE and SZSE evaluate the normative compliance, authenticity, accuracy, completeness, timeliness, fairness, and effectiveness of listed companies' information disclosure, resulting in an overall disclosure rating for each company. This rating system has been widely adopted in academic research as a reliable measure of information disclosure quality. The evaluation results of both the SSE and SZSE are categorized into four grades: A, B, C, and D, representing "excellent," "good," "pass," and "fail," respectively. In this study, these grades are assigned numerical values of 4, 3, 2, and 1, with higher values indicating higher quality of information disclosure.

3.2.2 Independent variables

The Number of Penalty Violations for Listed Companies in the Industry (IPN): This variable represents the number of times the sample listed companies were penalized by the CSRC and its local agencies in the previous year. The classification follows the 2012 industry classification standard of the CSRC.

The Number of Penalties for Listed Companies in the Region (CPN): This variable measures the number of times listed companies in the same region were penalized in the previous year. The region is determined based on the registered address of the listed company, with firms in the same city grouped into the same region.

This study follows the methodology of Ding et al. (2022) and Xin et al. (2013). Based on the CSMAR database, violations by listed companies are categorized into six types: fictitious profits, virtual assets, false records (misleading statements), delayed disclosure, major omissions, and other similar information disclosure violations. The date of violation is taken as the announcement date of the violation. Specifically, if a single announcement contains two or more violations, it is treated as one violation event. In other words, each time a listed company within an industry or region receives a violation notice of penalties, the number of penalties for the industry or region increases by one unit.

3.2.3 Moderator variables

Degree of Industry Competition: This study follows the methodology of Yang et al. (2016). The Herfindahl-Hirschman Index (HHI) is used to measure the degree of competition within an industry. Specifically, the market share of each listed company is calculated using the book value of its equity relative to the total market. The square of each company's market share is then summed to obtain the HHI. A higher HHI indicates lower competition within the industry, as it suggests greater concentration of market share.

Level of Regional Development (Area): This study refers to Ren (2024) for the regional classification. Based on the classification standards of the China National Bureau of Statistics, regions are divided into eastern, central, northeast, and western categories. Listed companies in the eastern region are assigned a value of 1, while companies in other regions are assigned a value of 0. The eastern region is characterized by a relatively high level of economic development and a more advanced degree of marketization.

3.2.4 Control variables

This study follows the methodology of Mei et al. (2021), Xu & Xue (2023), and Zhou & Zeng (2024). The following control variables are selected:

Internal governance variables: board of directors size (BOD), executive shareholding ratio (MS), proportion of independent directors (Indep), and equity concentration (Top1).

External governance variables: share ratio of institutional investors (Instit), whether the auditor is from a Big

Four accounting firm (Big4), and financing constraints (SA).

Characteristics of listed companies: total assets net profit margin (ROA), listing years (Age), whether the company incurred a loss (Loss), and company size (Size).

In total, 11 control variables are used, with the specific calculation methods outlined in Table 1.

Table 1. Variable definitions

Type of Variables	Variable Name	Variable Symbol	Variable Declaration
Dependent variable	Quality of information disclosure	Qua	The SSE and the SZSE information disclosure rating
Independent variables	Number of illegal penalties imposed for listed companies in the industry	IPN	The number of penalties for the t-1 period of peer listed companies
	Number of illegal penalties imposed for listed companies in the region	CPN	The same city listed companies t-1 penalty times
Moderator variables	Degree of industry competition	HHI	The Herfindahl-Hirschman Index
	Level of regional development	Area	The eastern region was assigned a value of 1, and the rest was assigned to 0
Control variables	The board of directors size	BOD	The natural logarithm of the sum of the number of directors
	Executive shareholding ratio	MS	The proportion of the total number of shares held by senior management to the total number of shares of the company
	The proportion of independent directors	Indep	The proportion of the number of independent directors to the total number of directors
	Equity concentration	Top1	The largest shareholder shareholding ratio
	Share ratio of institutional investors	Instit	The proportion of institutional investors holding shares in the total number of shares
	Whether the auditor is from the Big Four accounting firm	Big4	Whether the auditor is from a Big Four international accounting firm, is 1, no 0
	Financing constraints	SA	Financing constraint Index
	Total assets net profit margin	ROA	Net profit after tax / Total assets
	Listing years	Age	First listing period of listed companies
	Whether the loss	Loss	Net profit in the current period is negative =1, otherwise it is 0
	Company size	Size	Natural logarithm of the companys total assets

3.3 Empirical Model

To test hypotheses H1 and H2, Models (1) and (2) were constructed. Model (1) examines the industry spillover effect and includes regional fixed effects to control for potential regional spillover interference. Model (2) tests the regional spillover effect and includes industry fixed effects to control for potential industry spillover interference. Both Models (1) and (2) incorporate all control variables (denoted as “Control”) and include annual fixed effects.

In particular, when information disclosure quality (Qua) is used as the dependent variable, the choice of research strategy must consider both the characteristics of the data and the applicability of the model. In this regression analysis, a high-dimensional fixed-effect model was adopted for the following reasons: First, the high-dimensional fixed-effect model effectively controls the complexity arising from a large number of fixed effects in panel data, especially the industry and city-specific effects that this paper needs to account for. This model eliminates the bias introduced by these effects, allowing for more accurate causal estimates. Second, although the quality of information disclosure is essentially an ordinal categorical variable, the high-dimensional fixed-effect model still provides valuable causal insights in the initial regression stage, especially when different quality levels are treated as continuous variables with isometric properties. Additionally, to ensure the robustness of the results, the study was reanalyzed using the generalized ordered logistic regression (Gologit) model as part of the robustness checks.

$$Qua_{i,t} = \beta_0 + \beta_1 IPN_{i,t} + \sum_j \beta_j Control_{j,i,t} + \sum_i \delta_i City + \sum_t \alpha_t Year + \varepsilon_{i,t} \quad (1)$$

$$Qua_{i,t} = \beta_0 + \beta_1 CPN_{i,t} + \sum_j \beta_j Control_{j,i,t} + \sum_i \gamma_i Industry + \sum_t \alpha_t Year + \varepsilon_{i,t} \quad (2)$$

To test hypothesis H3, Model (3) was constructed. Building on Model (1), the moderator variable (HHI) and the interaction term (HHI*IPN) between the moderator and the explanatory variable are added to Model (3), along with the control variables, annual fixed effects, and regional fixed effects.

$$Qua_{i,t} = \beta_0 + \beta_1 IPN_{i,t} + \beta_2 HHI_{i,t} + \beta_3 (IPN * HHI)_{i,t} + \sum_j \beta_j Control_{j,i,t} + \sum_i \delta_i City + \sum_t \alpha_t Year + \varepsilon_{i,t} \quad (3)$$

To test hypothesis H4, Model (4) was constructed. Based on Model (2), a group regression is conducted for the eastern region and other regions. Additionally, control variables, annual fixed effects, and industry fixed effects are included.

$$Qua_{i,t} = \beta_0 + \beta_1 CPN_{i,t} + \sum_j \beta_j Control_{j,i,t} + \sum_i \gamma_i Industry + \sum_t \alpha_t Year + \varepsilon_{i,t} \quad (4)$$
$$(\text{If } Area = 1 \text{ or } 2)$$

4. Results

4.1 Descriptive Statistics

Table 2 presents the descriptive statistics for the main variables. The average disclosure quality (Qua) is 2.969, with a median of 3.000, indicating that most companies' disclosure quality ratings are concentrated at the "good" level. The average number of violations (IPN) for listed companies in the industry is 1.091, with a median of 0 and a standard deviation of 1.822, suggesting a relatively scattered data distribution and significant variation in the number of violations across industries. The average number of violation penalties (CPN) for listed companies in the region is 0.876, with a median of 0 and a standard deviation of 2.816, indicating that while violations are relatively few in the region, there is substantial volatility and inequality in their distribution. The remaining variables are summarized in Table 2.

Table 2. Descriptive statistics

Variable	N	Mean	p50	sd	Min	Max
Qua	31195	2.969	3	0.673	1	4
IPN	31195	1.091	0	1.822	0	12
CPN	31195	0.876	0	2.816	0	24
HHI	31195	0.071	0.042	0.097	0.009	1
Indep	31195	37.461	35.71	5.763	0	100
MS	31195	0.073	0.002	0.138	0	0.843
Instit	31195	42.363	43.811	24.169	0	98.927
ROA	31195	0.711	0.034	133.645	-2146.161	23509.769
Size	31195	22.014	21.851	1.332	10.842	28.636
Big4	31195	1.955	2	0.208	1	2
Age	31195	2.239	2.286	0.69	0.693	3.499
BOD	31195	2.271	2.197	0.255	1.386	3.401
SA	31195	-3.793	-3.794	0.294	-5.69	2.131
Loss	31195	0.143	0	0.35	0	1
Top1	31195	33.071	30.208	14.746	1.844	89.991

4.2 Baseline Result

4.2.1 Industry spillover effect of the punishment for information disclosure violations

Table 3, first column, presents the regression results for Model (1), which tests whether the punishment of listed companies within the same industry affects the information disclosure quality of other listed companies, i.e., the industry spillover effect of penalties for information disclosure violations. The results indicate that the regression coefficient for the number of violation penalties (IPN) of listed companies in the industry is significantly positive at the 1% level. This finding suggests that penalties for information disclosure violations do indeed have an industry spillover effect, supporting hypothesis H1.

4.2.2 Regional spillover effect of the punishment for information disclosure violations

The second column of Table 3 presents the regression results for Model (2), which tests whether the punishment

of listed companies in the same region affects the information disclosure quality of other companies, i.e., the regional spillover effect of penalties for information disclosure violations. The results show that the regression coefficient for the number of violation penalties (CPN) of listed companies in the region is significantly positive at the 1% level. This indicates that penalties for information disclosure violations do have a regional spillover effect, supporting hypothesis H2.

Table 3. Spillovers of penalties for information disclosure violations

	Industry Spillover Effect Qua	Regional Spillover Effect Qua
IPN	0.008***	
	(3.789)	
CPN		0.010***
		(7.954)
Indep	-0.003***	-0.003***
	(-4.596)	(-4.770)
MS	0.215***	0.220***
	(6.618)	(6.852)
Instit	0.002***	0.002***
	(10.945)	(10.849)
Size	0.000	0.000
	(0.041)	(0.078)
Big4	0.116***	0.127***
	(34.453)	(37.007)
ROA	-0.129***	-0.126***
	(-7.403)	(-7.215)
Age	-0.108***	-0.110***
	(-15.992)	(-16.318)
BOD	-0.107***	-0.1116***
	(-7.172)	(-7.491)
SA	0.071***	0.0594***
	(4.542)	(3.850)
Loss	-0.509***	-0.536***
	(-50.948)	(-53.181)
Top1	0.002***	0.002***
	(8.556)	(8.367)
_cons	1.403***	1.144***
	(12.982)	(10.543)
City	Yes	No
Industry	No	Yes
Year	Yes	Yes
N	31177	31195
R^2	0.259	0.227
adj. R^2	0.249	0.224

Note: t-statistics in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

4.3 Endogenous Analysis

4.3.1 Instrumental variables method

The improvement in the quality of information disclosure among listed companies may not necessarily be due to the spillover effect of penalties for illegal information disclosure in the industry and region. It could instead result from exogenous shocks, such as strengthened supervision and policy changes, or from other unobservable individual characteristics specific to the industry or region. Both exogenous factors and individual characteristics could influence the improvement in information disclosure quality. Therefore, the instrumental variables (IV) method is employed to address potential endogeneity issues.

Firstly, this paper uses the average level of accrued earnings management for listed companies penalized for information disclosure violations in the same industry or region as the instrumental variable. The rationale is that the higher the degree of earnings management among listed companies, the more likely they are to commit information disclosure violations (Ma et al., 2014; Qu & Cai, 2007), thus satisfying the correlation requirement. At the same time, there is no evidence to suggest that the improvement in the information disclosure quality of listed companies is directly influenced by the earnings management levels of other companies in the same industry or region, thereby satisfying the exogeneity requirement. The accrued earnings management level (DJ) is calculated using the modified Jones model, with data sourced from the CSMAR database. Based on industry and regional classifications, the average earnings management level (IDJ) for firms in the industry and the average

earnings management level (CDJ) for firms in the region are calculated, respectively.

Secondly, the independent variable (IPN/CPN) was regressed using the instrumental variables (IDJ/CDJ), with control variables and fixed effects consistent with those in Model (1) and Model (2). Columns (1) and (3) of Table 4 present the regression results for the average level of earnings management of illegal enterprises in the industry (IDJ), the average level of earnings management of illegal enterprises in the region (CDJ), the number of violation penalties for listed companies in the industry (IPN), and the number of violation penalties for listed companies in the region (CPN). The regression coefficients for IDJ and CDJ on IPN and CPN were both significantly positive at the 1% level, indicating that the instrumental variables satisfy the correlation requirement.

Finally, the estimates from the first stage were used to regress the quality of disclosure (Qua) for the following year. Columns (2) and (4) of Table 4 present the regression results for Qua. The regression coefficient of the estimated value on Qua is significant at the 1% level, indicating that penalties for information disclosure violations have both an industry spillover effect and a regional spillover effect. This finding supports hypotheses H1 and H2 and confirms the robustness of the conclusions in this paper.

Table 4. Test of instrumental variables

	(1) IPN	(2) Qua	(3) CPN	(4) Qua
IDJ	1.531***			
	(32.966)			
CDJ			3.883***	
			(75.633)	
L.V1		0.046***		
		(4.120)		
L.V2				0.017***
				(4.997)
Indep	-0.002	-0.003***	-0.001	-0.003***
	(-1.051)	(-4.147)	(-0.443)	(-4.497)
MS	-0.028	0.241***	0.120	0.242***
	(-0.307)	(6.552)	(0.924)	(6.635)
Instit	-0.002***	0.003***	-0.001*	0.002***
	(-4.163)	(10.779)	(-1.706)	(10.505)
Size	-0.000	0.000	-0.000	0.000
	(-0.971)	(0.105)	(-0.563)	(0.122)
Big4	-0.044***	0.120***	0.081***	0.128***
	(-4.703)	(32.403)	(5.867)	(34.374)
ROA	0.072	-0.136***	-0.392***	-0.125***
	(1.492)	(-7.072)	(-5.560)	(-6.502)
Age	-0.099***	-0.111***	0.034	-0.119***
	(-5.338)	(-13.172)	(1.248)	(-14.283)
BOD	-0.120***	-0.107***	-0.110*	-0.119***
	(-2.941)	(-6.649)	(-1.820)	(-7.397)
SA	0.074*	0.070***	0.377***	0.053***
	(1.712)	(4.050)	(6.027)	(3.071)
Loss	-0.046*	-0.506***	0.167***	-0.534***
	(-1.672)	(-47.825)	(4.091)	(-49.949)
Top1	-0.008***	0.003***	0.003***	0.002***
	(-10.027)	(8.892)	(2.918)	(7.774)
_cons	2.977***	1.268***	1.092**	1.124***
	(10.023)	(10.261)	(2.483)	(9.465)
City	Yes	Yes	No	No
Industry	No	No	Yes	Yes
Year	Yes	Yes	Yes	Yes
N	31177	26694	31195	26708
R^2	0.235	0.266	0.276	0.232
adj. R^2	0.224	0.254	0.273	0.228

Note: t-statistics in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

4.3.2 Propensity Score Matching (PSM)

This study may also suffer from endogeneity issues arising from sample self-selection, meaning that the improvement in the quality of information disclosure among listed companies may not be due to the spillover effect of penalties for information disclosure violations, but rather driven by factors inherent to the companies themselves. To address this issue, this paper employs the Propensity Score Matching (PSM) method to mitigate the endogeneity problem.

Firstly, based on whether a listed company in the industry or region has been penalized by the CSRC and its

local offices for information disclosure violations, the sample is divided into a treatment group and a control group. Using the control variables from Models (1) and (2), a 1:1 nearest neighbor matching is performed between the treatment group and the control group, excluding observations with a propensity score below 1%. Subsequently, Models (1) and (2) are re-estimated using the matched samples. Table 5 presents the regression results after PSM matching. The regression coefficients for IPN and CPN on Qua are both significant at the 1% level, which verifies hypotheses H1 and H2 and demonstrates that the conclusions of this paper are robust to endogeneity concerns.

Table 5. The PSM test

	Industry Spillover Effect Qua	**Regional Spillover Effect Qua**
IPN	0.009***	
	(3.997)	
CPN		0.009***
		(6.301)
Indep	-0.002***	-0.002***
	(-3.366)	(-2.582)
MS	0.202***	0.201***
	(5.740)	(4.705)
Instit	0.002***	0.002***
	(9.650)	(6.507)
Size	0.042***	0.104***
	(4.330)	(5.784)
Big4	0.116***	0.128***
	(30.345)	(26.971)
ROA	-0.145***	-0.123***
	(-7.569)	(-6.212)
Age	-0.110***	-0.104***
	(-14.523)	(-10.968)
BOD	-0.116***	-0.113***
	(-7.040)	(-5.502)
SA	0.040**	0.076***
	(2.156)	(3.634)
Loss	-0.505***	-0.501***
	(-45.297)	(-36.128)
Top1	0.003***	0.003***
	(8.622)	(7.082)
_cons	-0.002***	1.128***
	(-3.366)	(7.374)
City	Yes	No
Industry	No	Yes
Year	Yes	Yes
N	25688	15997
R^2	0.260	0.242
adj. R^2	0.248	0.237

Note: t-statistics in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

4.4 Robustness Check

4.4.1 Change the calculation method of the explanatory variables

Considering that the same listed company may be penalized multiple times in the same year for the same or different information disclosure violations, the original method of calculating the explanatory variables may either underestimate or overestimate the actual frequency of violations and their impact on the information disclosure quality of other companies. Therefore, this paper modifies the explanatory variables by measuring the number of listed companies (IPC/CPC) in the same city and industry that were penalized for information disclosure violations in the previous year. As shown in Table 6, the revised explanatory variables were substituted into Models (1) and (2), and the results remain consistent, confirming the robustness of the conclusions in this paper.

4.4.2 Reduce the sample range

To account for the potential impact of exogenous shocks during the COVID-19 pandemic, data from the 2020-2022 period were excluded from the regression analysis. Table 7 presents the regression results after narrowing the sample range. The number of violations by industry-listed companies (IPN) and by listed companies in the region (CPN) are significant at the 1%-5% level, verifying hypotheses H1 and H2. These results further confirm the robustness of the conclusions in this paper.

Table 6. The calculation of explanatory variables

	Industry Spillover Effect Qua	Regional Spillover Effect Qua
IPC	0.008***	
	(3.671)	
CPC		0.012***
		(8.234)
Indep	-0.003***	-0.003***
	(-4.594)	(-4.777)
MS	0.215***	0.220***
	(6.619)	(6.835)
Instit	0.002***	0.002***
	(10.944)	(10.857)
Size	0.000	0.000
	(0.040)	(0.077)
Big4	0.116***	0.127***
	(34.440)	(37.005)
ROA	-0.129***	-0.125***
	(-7.403)	(-7.172)
Age	-0.108***	-0.110***
	(-15.999)	(-16.324)
BOD	-0.107***	-0.112***
	(-7.167)	(-7.490)
SA	0.071***	0.059***
	(4.538)	(3.838)
Loss	-0.509***	-0.536***
	(-50.942)	(-53.191)
Top1	0.002***	0.002***
	(8.544)	(8.357)
_cons	1.404***	1.142***
	(12.993)	(10.523)
City	Yes	No
Industry	No	Yes
Year	Yes	Yes
N	31177	31195
R^2	0.259	0.227
adj. R^2	0.249	0.225

Note: t-statistics in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 7. Narrowed down the sample range

	Industry Spillover Effect Qua	Regional Spillover Effect Qua
IPN	0.009**	
	(2.343)	
CPN		0.018***
		(3.034)
Indep	-0.003***	-0.003***
	(-4.215)	(-3.877)
MS	0.176***	0.190***
	(4.400)	(4.818)
Instit	0.002***	0.002***
	(8.136)	(8.698)
Size	-0.000	-0.000
	(-0.200)	(-0.288)
Big4	0.111***	0.117***
	(25.453)	(26.971)
ROA	-0.115***	-0.113***
	(-4.900)	(-4.828)
Age	-0.113***	-0.120***
	(-13.282)	(-14.111)
BOD	-0.090***	-0.097***
	(-4.809)	(-5.181)
SA	0.089***	0.076***
	(4.349)	(3.795)

Loss	-0.552***	-0.580***
	(-41.497)	(-43.256)
Top1	0.002***	0.002***
	(5.284)	(5.053)
_cons	1.561***	1.392***
	(11.803)	(10.517)
City	Yes	No
Industry	No	Yes
Year	Yes	Yes
N	20430	20470
R^2	0.259	0.218
adj. R^2	0.246	0.214

Note: t-statistics in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 8. Change of the regression models

	(1) Qua	**(2) Qua**	**(3) Qua**	**(4) Qua**	**(5) Qua**	**(6) Qua**
	mleq1		mleq2		m leq3	
IPN	0.041*		0.020**		0.035***	
	(1.889)		(1.996)		(3.464)	
CPN		0.076***		0.042***		0.030***
		(4.287)		(5.667)		(5.175)
Indep	-0.023***	-0.020***	-0.015***	-0.016***	-0.001	-0.003
	(-3.784)	(-3.420)	(-4.661)	(-5.343)	(-0.461)	(-0.973)
MS	0.901*	1.381***	0.887***	0.907***	0.887***	0.840***
	(1.851)	(2.949)	(4.750)	(5.038)	(5.756)	(5.666)
Instit	0.004*	0.005**	0.006***	0.006***	0.012***	0.011***
	(1.681)	(2.041)	(5.555)	(5.603)	(11.436)	(11.034)
ROA	0.024	0.000	-0.000	-0.000	0.034***	0.038***
	(0.757)	(0.042)	(-0.182)	(-0.221)	(3.369)	(3.852)
Size	0.272***	0.269***	0.243***	0.272***	0.556***	0.634***
	(7.653)	(7.967)	(14.593)	(16.899)	(30.442)	(33.928)
Big4	-0.752**	-0.820**	-0.399***	-0.440***	-0.398***	-0.354***
	(-2.311)	(-2.522)	(-3.707)	(-4.134)	(-5.664)	(-5.160)
Age	-0.659***	-0.561***	-0.510***	-0.528***	-0.369***	-0.375***
	(-7.306)	(-6.786)	(-14.100)	(-15.195)	(-10.694)	(-11.080)
BOD	-1.164***	-1.012***	-0.337***	-0.384***	-0.182**	-0.235***
	(-8.267)	(-7.499)	(-4.663)	(-5.517)	(-2.456)	(-3.261)
SA	0.155	0.122	-0.098	-0.084	0.219***	0.142*
	(0.883)	(0.795)	(-1.166)	(-1.048)	(2.659)	(1.802)
Loss	-1.906***	-1.950***	-1.594***	-1.620***	-2.161***	-2.279***
	(-24.719)	(-26.402)	(-39.759)	(-41.783)	(-19.663)	(-20.356)
Top1	0.021***	0.017***	0.013***	0.012***	0.004***	0.005***
	(5.633)	(4.977)	(8.695)	(8.445)	(2.778)	(3.818)
_cons	4.426***	3.382***	-2.239***	-2.951***	-12.027***	-14.291***
	(3.866)	(2.850)	(-4.322)	(-5.454)	(-20.498)	(-22.174)
Industry	No	Yes	No	Yes	No	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
City	Yes	No	Yes	No	Yes	No
N	31165	31196	31165	31196	31165	31196

Note: t-statistics in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

4.4.3 Change the regression model

To enhance the robustness and interpretability of the results, this section uses the generalized ordered logistic regression (Gologit) model for the robustness test. The Gologit model is designed to handle ordered categorical data, particularly when the proportional odds assumption of the ordered logit model does not hold. Unlike the ordered logit model, the Gologit model allows for independent transition probabilities between each category, providing a more accurate representation of the true conversion process between levels of information disclosure quality. Table 8 presents the results of the regression using the Gologit model, where mlep1, mlep2, and mlep3 represent the transitions of information disclosure quality levels from “fail” to “pass”, “pass” to “good”, and “good” to “excellent”, respectively. The results show that the coefficient of the number of violation penalties (IPN) on information disclosure quality is positive and significant. In mlep1, the coefficient of IPN is 0.041, significant at the 10% level, indicating that the marginal probability of improving information disclosure quality in the industry from “fail” to “pass” increases by approximately 0.041 (or 4.1%). A similar pattern is observed in mlep2

and mlep3. Similarly, the number of violation penalties (CPN) for listed companies in the region also shows a significant positive effect. In mlep2, the coefficient of CPN is 0.076 and significant at the 1% level, indicating that each penalty for information disclosure violations in the region increases the likelihood that the information disclosure quality of other companies in the region will improve from "pass" to "good". This effect is also observed in mlep1 and mlep3. Based on the above analysis, the results from the Gologit model support the spillover effect of penalties for information disclosure violations observed in the basic regression. Whether at the industry or regional level, the positive spillover effect of penalties on improving the quality of unpenalized companies is robust.

4.5 Moderating Effect Results

4.5.1 Degree of industry competition

The first column of Table 9 presents the regression results for Model (3), testing the impact of industry competition on the spillover effect of information disclosure violations. The results show that after including the moderator variable and interaction term, the regression coefficient for the number of violations by industry-listed companies (IPN) is significantly positive at the 1% level. At the same time, the interaction term (IPN*HHI) is significantly negative at the 1% level, indicating that the higher the degree of industry competition, the stronger the spillover effect of penalties for information disclosure violations. This finding supports hypothesis H3.

Table 9. Influencing actors of spillover effects

	Industry Spillover Effect	**Regional Spillover Effect (East)**	**Regional Spillover Effect (Other Areas)**
	Qua	**Qua**	**Qua**
IPN	0.011***		
	(4.177)		
CPN		0.010***	0.021*
		(7.500)	(1.661)
HHI	-0.080**		
	(-2.126)		
IPN* HHI	-0.237***		
	(-2.778)		
Indep	-0.003***	-0.004***	-0.001
	(-4.572)	(-4.541)	(-1.192)
MS	0.214***	0.170***	0.379***
	(6.572)	(4.717)	(5.186)
Instit	0.002***	0.002***	0.004***
	(11.049)	(6.961)	(9.193)
Size	0.000	0.013***	-0.000
	(0.123)	(2.877)	(-0.152)
Big4	0.116***	0.135***	0.111***
	(34.510)	(32.209)	(17.840)
ROA	-0.130***	-0.118***	-0.145***
	(-7.460)	(-5.956)	(-3.887)
Age	-0.107***	-0.104***	-0.132***
	(-15.809)	(-12.669)	(-10.300)
BOD	-0.106***	-0.127***	-0.075***
	(-7.102)	(-7.046)	(-2.813)
SA	0.074***	0.053***	0.057*
	(4.692)	(2.900)	(1.883)
Loss	-0.509***	-0.534***	-0.516***
	(-50.857)	(-43.481)	(-28.913)
Top1	0.003***	0.003***	0.001*
	(8.600)	(8.903)	(1.739)
_cons	1.409***	0.988***	1.362***
	(13.033)	(7.370)	(7.128)
City	Yes	No	No
Industry	No	Yes	Yes
Year	Yes	Yes	Yes
N	31177	21780	9413
R^2	0.259	0.228	0.241
adj. R^2	0.249	0.224	0.233

Note: t-statistics in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

4.5.2 Level of regional development

The second and third columns of Table 9 present the regression results for Model (4), testing the impact of

regional development on the spillover effect of information disclosure violations. The results show that the regional spillover effect of penalties for information disclosure violations is significantly positive at the 1%-10% level, with the coefficient in other regions being 0.021, which is higher than 0.010 in the eastern region. This indicates that the spillover effect is more pronounced in other regions compared to the eastern region, suggesting that the level of regional development has a negative impact on regional spillover. This finding supports hypothesis H4.

4.6 Further Analysis

4.6.1 Publication period and spillover effect of penalty documents

Table 10. Publication of the cycle group regression

	The Announcement Cycle is Normal Qua	The Publication Cycle is Longer Qua	The Announcement Cycle is Normal Qua	The Publication Cycle is Longer Qua
IPN	0.019***	0.013***		
	(3.343)	(2.831)		
CPN			0.014***	0.007***
			(3.519)	(2.878)
Indep	-0.004***	-0.004*	-0.003**	-0.004
	(-3.401)	(-1.907)	(-2.425)	(-1.263)
MS	0.151***	0.242**	0.218***	0.212
	(2.732)	(2.534)	(3.340)	(1.517)
Instit	0.002***	0.002***	0.002***	0.004***
	(4.899)	(2.956)	(4.836)	(3.930)
Size	0.025**	0.791***	-0.000	0.532***
	(2.307)	(8.330)	(-0.016)	(3.643)
Big4	0.123***	0.123***	0.122***	0.124***
	(21.527)	(10.614)	(17.268)	(8.168)
ROA	-0.165***	-0.019	-0.127***	-0.254***
	(-5.716)	(-0.310)	(-3.940)	(-4.574)
Age	-0.129***	-0.066***	-0.090***	-0.072**
	(-11.303)	(-2.908)	(-6.288)	(-2.386)
BOD	-0.127***	-0.165***	-0.128***	-0.059
	(-5.059)	(-3.486)	(-3.951)	(-0.959)
SA	0.066**	0.094*	0.117***	0.066
	(2.412)	(1.797)	(3.563)	(1.056)
Loss	-0.521***	-0.334***	-0.534***	-0.340***
	(-30.844)	(-9.346)	(-24.592)	(-7.875)
Top1	0.003***	0.003***	0.003***	0.001
	(5.803)	(2.688)	(5.696)	(1.023)
_cons	1.399***	1.168***	1.426***	1.252**
	(7.377)	(3.038)	(6.188)	(2.481)
City	Yes	Yes	No	No
Industry	No	No	Yes	Yes
Year	Yes	Yes	Yes	Yes
N	11112	2907	6507	1515
R^2	0.292	0.350	0.256	0.350
adj. R^2	0.268	0.295	0.244	0.314

Note: t-statistics in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Does the publication period of penalty documents affect the spillover effect of penalties for information disclosure violations? To explore this, this paper constructs a publication cycle index for penalty documents and tests the impact of the publication period on the spillover effect using group analysis. First, following the approach of Firth et al. (2009), this study measures the publication period of penalty documents by the interval between the "date of the penalty document" and the "date of punishment." The shorter the number of days in this interval, the shorter the publication period. Second, the publication periods of penalty documents from the previous year within the industry/region are summed, and the median is calculated. The samples are then divided into two groups based on the median publication cycle: the group with a normal publication cycle and the group with a long publication cycle. Model (1) and Model (2) are then applied to group regression. In particular, for samples where there are no information disclosure violations in the previous year, there will be no publication cycle for penalty documents. Therefore, these samples are excluded from the analysis to avoid interfering with the results. Table 10 reports the impact of the spillover effect, with the publication cycle in the normal group, the number of violations by industry-listed companies (IPN), and the number of violations by listed companies in the region (CPN) on information

disclosure quality (Qua). The results show that a shorter publication period is associated with a stronger spillover effect of penalties for information disclosure violations.

4.6.2 Continuous influence of the punishment for information disclosure violations

Table 11. Continuous influence of spillover effects

	Event Within One Year Qua	Three Years after the Incident Qua	Event Within One Year Qua	Three Years after the Incident Qua
IPN	0.008***			
	(3.789)			
L3.IPN		0.006		
		(1.400)		
CPN			0.010***	
			(7.954)	
L3.CPN				0.010*
				(1.704)
Indep	-0.003***	-0.003***	-0.003***	-0.004***
	(-4.596)	(-3.938)	(-4.770)	(-4.735)
MS	0.215***	0.268***	0.220***	0.267***
	(6.618)	(5.589)	(6.852)	(5.634)
Instit	0.002***	0.002***	0.002***	0.003***
	(10.945)	(8.305)	(10.849)	(8.681)
Size	0.000	0.000	0.000	0.000
	(0.041)	(0.051)	(0.078)	(0.188)
Big4	0.116***	0.126***	0.127***	0.136***
	(34.453)	(29.233)	(37.007)	(31.397)
ROA	-0.129***	-0.106***	-0.126***	-0.102***
	(-7.403)	(-4.518)	(-7.215)	(-4.362)
Age	-0.108***	-0.105***	-0.110***	-0.101***
	(-15.992)	(-8.836)	(-16.318)	(-8.482)
BOD	-0.107***	-0.123***	-0.112***	-0.139***
	(-7.172)	(-6.572)	(-7.491)	(-7.387)
SA	0.071***	0.082***	0.059***	0.070***
	(4.542)	(3.950)	(3.849)	(3.457)
Loss	-0.509***	-0.502***	-0.536***	-0.533***
	(-50.948)	(-41.675)	(-53.181)	(-43.862)
Top1	0.002***	0.003***	0.002***	0.003***
	(8.556)	(7.386)	(8.367)	(7.273)
_cons	1.403***	1.216***	1.144***	1.011***
	(12.982)	(8.696)	(10.543)	(7.256)
City	Yes	Yes	No	No
Industry	No	No	Yes	Yes
Year	Yes	Yes	Yes	Yes
N	31177	19467	31195	19508
R^2	0.259	0.278	0.227	0.238
adj. R^2	0.249	0.265	0.224	0.234

Note: t-statistics in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Do the spillover effects of penalties for information disclosure violations diminish over time? To investigate this, this paper follows the approach of Liao & Feng (2023). The window period for the information disclosure violation penalty event was adjusted to t-3 years, comparing the difference in spillover effects within one year and three years after the event. Table 11 presents the regression results after adjusting the window period. Within one year of the event, the number of violation penalties (IPN) in the industry had a significant positive impact on the information disclosure quality (Qua) of other listed companies, with a regression coefficient of 0.008, significant at the 1% level. However, when the time span was extended to three years, the regression coefficient for IPN remained positive but decreased to 0.006 and was no longer statistically significant. This indicates that the spillover effect weakened or even disappeared after three years, suggesting that the positive impact of penalties for information disclosure violations on the industry gradually declined over time. A similar trend was observed for regional spillover effects. Within one year of the event, the impact of the number of violation penalties (CPN) for listed companies in the region on the information disclosure quality of other companies was significant at the 1% level. However, after three years, the regression coefficient for CPN, while still positive, was only significant at the 10% level, indicating that the

influence of regional spillover effects decreased over time.

5. Discussion

5.1 Theoretical Implications

This study reveals the spillover effects of penalties for disclosure noncompliance on the information disclosure quality of unpenalized listed companies within the same industry and region through regression analysis. Theoretically, this research has three main implications.

(1) Emphasizing the Positive Impact of Penalties for Disclosure Noncompliance

This study confirms the positive spillover effects of penalties for disclosure noncompliance, aligning with prior findings in the domains of environmental regulation (Evans et al., 2018) and audit quality improvement (Liu et al., 2019). However, unlike prior studies that primarily focused on the direct effects, such as the improved compliance of penalized firms and those with explicit relational ties (Gui & Wen, 2024; Jiang et al., 2024; Zhou & Zeng, 2024), this research explores the broader industry-wide and region-wide impacts of penalties, an area that has been less explored in the context of information disclosure. This contribution deepens our understanding of how penalties extend beyond the penalized firms to promote market-wide compliance and transparency, offering insights into regulatory enforcement's indirect effects.

(2) Identifying the Influence of Industry Competition and Regional Development

The finding that industry competition amplifies the spillover effect of penalties supports prior research suggesting that competitive industries are more sensitive to external regulatory signals (Shang & Wu, 2022; Yang et al., 2024). In competitive industries, firms face greater pressure to maintain their market position and reputation, which may lead to heightened responsiveness to regulatory penalties. This heightened sensitivity could encourage firms to improve their compliance behaviors to safeguard their competitive edge. Additionally, industries with intense competition often have more developed communication channels, such as industry associations and forums, which can accelerate the spread of regulatory penalties' effects, thereby magnifying their impact across the sector.

Similarly, this study contributes to the understanding of regional development's role in moderating spillover effects, building on institutional theory. While previous research highlights the advantages of developed regions, such as stronger governance and regulatory systems (Shen & Feng, 2012; Zhang & Jiang, 2013), this study provides a nuanced perspective. In less developed regions, where firms rely more heavily on external cues and peer learning, penalties serve as a stronger wake-up call, leading to a more pronounced spillover effect. These findings highlight the importance of tailoring regulatory strategies to the characteristics of both industries and regions.

(3) Revealing the Timeliness of Penalty Announcement Cycles

The study also finds that the publication cycle of penalty announcements significantly affects the strength of the spillover effect. The shorter the publication cycle, the more pronounced the spillover effect. This suggests that timely penalty information quickly reaches market participants, prompting them to take action to improve their information disclosure quality (Chen & Meng, 2020).

However, the lasting impact of the spillover effect diminishes over time. This implies that regulatory authorities should adopt more frequent and timely penalty measures to sustain market vigilance regarding disclosure noncompliance.

5.2 Practical Implications

Based on the above analysis, this paper offers the following policy implications:

(1) Strengthening Law Enforcement and Supervision

Penalties for information disclosure violations have demonstrated positive spillover effects by improving the disclosure quality of other listed companies within the same industry and region. To enhance these effects, regulatory bodies such as the CSRC should intensify law enforcement and supervision efforts. This can be achieved by expanding the scope of disclosure inspections to target industries prone to information asymmetry and frequent violations. Increasing the frequency and depth of inspections, particularly through random checks, would ensure that potential violators are identified early. Additionally, adopting advanced technologies, such as big data analytics and artificial intelligence, can improve the ability to detect anomalies in financial and non-financial disclosures. These measures would not only curb violations more effectively but also create a culture of compliance and transparency across the capital market, thereby fostering trust among investors and stakeholders (Duan et al., 2022).

(2) Implementing Differentiated Regulatory Strategies

The effectiveness of regulatory penalties varies depending on industry competition and regional development levels, necessitating tailored strategies. For industries with intense competition and regions with lower development levels, regulatory agencies should enhance the visibility of enforcement actions through targeted

public education and media campaigns. Organising industry-specific seminars and publicising regulatory cases can help firms better understand the consequences of noncompliance and the benefits of robust disclosure practices. Moreover, incentives such as certifications or awards for companies excelling in disclosure practices could motivate others to follow suit. In contrast, for industries with lower competition and in more developed regions like eastern China, regulators can be achieved through ongoing training sessions for senior management, as well as incorporating disclosure requirements into broader corporate governance standards. By adopting such differentiated approaches, regulatory agencies can ensure the effectiveness of penalties across diverse industries and regions (Zhao et al., 2024).

(3) Optimising the Mechanism of Penalty Disclosure and Continuous Education

The timeliness of penalty disclosures plays a crucial role in amplifying their spillover effects. To maximise their impact, the CSRC and related agencies should streamline the penalty disclosure process by establishing clear timelines for publicising decisions. Using multiple communication channels, including official websites, press releases, and social media, can enhance the reach and credibility of penalty information. Furthermore, monitoring the impact of these disclosures by evaluating changes in corporate disclosure practices before and after penalties can provide insights for refining regulatory strategies. Continuous education is equally critical in sustaining the long-term deterrent effects of penalties. This can involve regular workshops, webinars, and case studies highlighting exemplary compliance practices. Such efforts would not only maintain market vigilance but also foster a culture of transparency and accountability, strengthening the overall integrity of the capital market (Ma et al., 2024).

6. Conclusions and Limitations

6.1 Conclusions

The spillover effect of penalties for information disclosure violations—from "managing a case" to "governing a sector"—is of great significance for strengthening information disclosure and improving the supervision and governance of listed companies in China, as well as for the CSRC. Focusing on the quality of information disclosure, this paper examines the spillover effect of penalties for information disclosure violations on unpenalized listed companies within the same industry and region. The study finds the following:

(1) The Punishment of Information Disclosure Violations Realizes the Shift from "Managing a Case" to "Governing a Sector"

Penalties for information disclosure violations produce both industry and regional spillover effects. Within one year of the penalty event, other listed companies in the same industry or region show significant improvements in their information disclosure quality. This indicates that regulatory penalties can prompt companies to self-examine and improve, thus enhancing market transparency and compliance overall.

(2) The Impact of Industry Competition and Regional Development on the Spillover Effect

The degree of industry competition and regional development level influence the spillover effect of penalties for information disclosure violations. In highly competitive industries and in non-eastern regions, the spillover effect is more pronounced. This suggests that in more competitive market environments and regions with lower levels of economic development, listed companies are more sensitive to external pressures and regulatory signals, prompting them to improve their information disclosure practices.

(3) The Heterogeneous Impact of the Publication Period of Penalty Documents

The timeliness of the publication of penalty decisions significantly affects the spillover effect. The shorter the publication period, the stronger the positive spillover effect on other listed companies in the industry and region. Furthermore, the spillover effect diminishes over time, suggesting that market participants' sensitivity to past punishment events decreases over time, leading to reduced responsiveness to regulatory measures.

6.2 Limitations

Despite the important findings, this study has several limitations.

First, the sample is limited to listed companies in China, which may restrict the generalizability of the results to other countries or regions with different regulatory environments and market characteristics. Future research could conduct cross-country comparisons to explore whether the spillover effects of penalties for information disclosure violations are consistent across different regulatory contexts and cultural environments. For instance, comparing the spillover effects in markets with varying levels of development, such as developed versus emerging markets, could provide valuable insights into the role of regulatory maturity in shaping the effectiveness of penalties.

Second, this study excludes financial and insurance industries, which operate under distinct regulatory frameworks and disclosure requirements. As a result, the conclusions drawn from this study may not be directly applicable to these sectors. Future research could explore how penalties for information disclosure violations affect companies in the financial and insurance industries, where regulatory dynamics and market characteristics differ

significantly from other industries. Such research would help broaden the applicability of the findings and provide a more comprehensive understanding of spillover effects in diverse contexts.

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Data Availability

The data used to support the research findings are available from the corresponding author upon request.

Conflicts of Interest

The authors declare no conflict of interest.

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