A Study on the Relationship between Short-Selling Mechanisms and Corporate Green Innovation

Tingxuan Chen
College of Economics and Management, Taizhou University, Taizhou, Zhejiang, China

Abstract: This research investigates the effect of short selling on corporate green innovation, addressing a critical intersection between capital market reform and environmental sustainability. Mechanism analysis shows that short selling primarily operates through intensified managerial short-sightedness,, while the quality effect remains insignificant across all subsamples. Further analysis reveals that firms with environmentally experienced CEOs and higher management ownership can partially mitigate the short selling increases green innovation quantity,while the quality effect is insignificant in the baseline model associated with short-selling pressure. This research leads to the literature by uncovering the nuanced relation between capital market mechanisms and corporate green behavior, and offers policy implications for designing complementary governance mechanisms that align short-term market discipline with long-term environmental sustainability.

Keywords: Short Selling; Green Innovation; Innovation Quality; Margin Trading Program; Difference-in-Differences

1. Introduction

The intersection of capital market reform and environmental sustainability has emerged as a critical research frontier in contemporary finance and corporate governance. On one hand, China's "dual carbon" goals-carbon peak by 2030 and carbon neutrality by 2060-have elevated corporate green transformation to a national strategic priority[1]. On the other hand, the progressive deregulation of short-selling constraints through China's margin trading program, launched in 2010 and subsequently expanded, has fundamentally altered the information environment and disciplinary mechanisms facing listed firms.

The relation between short selling and corporate innovation has generated considerable scholarly debate. Traditional agency theory recommends that short-selling threats can discipline managerial opportunism, improve information transparency, and enhance corporate governance[7]. From this perspective, short selling might encourage long-term value creation, including investments in green innovation that enhance future competitiveness. However, an alternative view emphasizes that short-selling pressure induces managerial short-sightedness, as managers facing potential stock price declines prioritize short-term earnings over long-term investments with uncertain payoffs[1][2]. Innovation-particularly green innovation characterized by high uncertainty, long gestation periods, and substantial upfront costs-may be particularly vulnerable to such pressure.

Existing empirical evidence presents a puzzling picture. Some studies document that short selling promotes green innovation[3][6], while others find that it hinders green transformation[1][9]. This study argues that these conflicting findings can be reconciled by distinguishing between innovation quantity and innovation quality. Drawing on the insight that firms may engage in "strategic" innovation to signal environmental responsibility without committing to substantive technological breakthroughs, we propose that short-selling pressure may increase the volume of green patent applications while failing to improve-or even undermining-the quality of green innovation[4].

Using China's margin trading program as a quasi-natural experiment, This setting provides some advantages: the staggered introduction of short-selling eligibility across multiple batches creates exogenous variation in short-selling pressure, mitigating endogeneity concerns that plague traditional corporate governance research. We measure green innovation using green patent data This research some several contributions to the literature. First, we bridge two largely separate research streams-the literature on short selling's governance effects and the literature on corporate green innovation-by examining their

intersection[8]. Second, we provide a nuanced understanding of how short selling affects innovation by distinguishing between quantity and quality dimensions, potentially reconciling conflicting findings in prior research. Third, we identify important boundary conditions, showing that firm characteristics such as ownership structure, governance mechanisms, and managerial attributes moderate the relationship between short selling and green innovation[11].

The remainder of this paper is organized as follows. Section 2 reviews relevant literature and develops our hypotheses. Section 3 describes the research design, including sample selection, variable measurement, and empirical methodology. Section 4 presents empirical results, including main findings, mechanism tests, and heterogeneity analyses. Section 5 concludes with implications for policy and practicep[5].

2. Literature Review and Hypothesis Development

2.1 Short Selling as an External Governance Mechanism

Short selling enables investors to profit from identifying overvalued stocks or firms with poor prospects, creating incentives to uncover and trade on negative information. A substantial literature documents that short-selling threats discipline managerial behavior by increasing the likelihood that value-destroying actions will be detected and penalized through stock price declines.

However, the governance influence of short selling are not uniformly beneficial. The threat of short selling can induce managerial short-sightedness, as managers facing potential stock price declines may sacrifice long-term value creation . This "short-termism" concern is particularly relevant for investment decisions with delayed payoffs[12].

2.2 Short Selling and Corporate Innovation

The relationship between short selling and corporate innovation has produced mixed empirical findings. On one hand, short selling may promote innovation by disciplining inefficient managers, improving resource allocation, and forcing firms to abandon inferior projects. Consistent with this view, several studies document that short-selling deregulation increases corporate innovation output[13].

On the other hand, short selling may impede innovation by exacerbating managerial short-termism. Innovation investments are inherently risky, with uncertain payoffs that may not materialize for years. Managers facing short-selling pressure may rationally cut innovation spending to boost current earnings and support stock prices. Moreover, even if innovation activities continue, managers may shift toward safer, incremental innovations rather than pursuing breakthrough innovations with higher risk but greater long-term value[14].

2.3 Green Innovation: Distinguishing Quantity from Quality

Green innovation occupies a unique position in the innovation landscape. Unlike general innovation, green innovation is shaped not only by market forces but also by regulatory pressures, stakeholder expectations, and societal demands for environmental sustainability[3]. This dual character makes green innovation particularly susceptible to symbolic rather than substantive corporate responses.

Prior research on short selling and green innovation has produced conflicting findings. Using Chinese data, Wu and You (2022) find that margin trading increases the quantity but not the quality of green innovation[3][10]. They attribute this pattern to agency problems and flawed incentive mechanisms that lead firms to pursue easily observable green activities rather than fundamental technological breakthroughs. In contrast, Chen et al. (2024) document that short-selling deregulation significantly enhances green innovation performance, with mechanism analyses showing that capital market pressure induces environmental protection investment[6].

These conflicting findings indicates that the relation between short selling and green innovation is more complex than a simple linear effect. We argue that distinguishing between innovation quantity and innovation quality may help reconcile these results. Short-selling pressure may incentivize firms to increase observable green activities-such as filing more green patent applications-to signal environmental responsibility to investors and regulators, while simultaneously discouraging the deep, risky investments required for high-quality green innovation.

2.4 Hypothesis Development

Building on the preceding discussion, we

propose that short selling has differential influences on green innovation quantity and quality. The threat of short selling creates pressure for firms to demonstrate environmental responsibility to multiple stakeholders: investors who increasingly incorporate environmental criteria into investment decisions, regulators who monitor environmental compliance, and the public who reward environmentally conscious firms. Filing green patents provides a visible, quantifiable signal of environmental commitment that can be communicated to stakeholders at relatively low cost.

However, substantive green innovation-captured by high-quality invention patents-requires sustained investment, tolerates uncertainty, and may not generate immediate returns. Managers facing short-selling pressure have strong incentives to avoid such investments, as any negative earnings surprises could trigger short-selling attacks and stock price declines. Even if firms maintain their innovation efforts, they may shift toward incremental, lower-risk projects that yield quicker but less transformative outcomes.

This reasoning leads to our first hypothesis:

Hypothesis 1a (Quantity Effect): Short selling is positively associated with the quantity of corporate green innovation.

Hypothesis 1b (Quality Effect): Short selling is not positively associated-or is negatively associated-with the quality of corporate green innovation.

The magnitude of short selling's effects likely depends on firm characteristics that shape managerial responses to external pressure. Firms with weaker governance structures may be more susceptible to short-termism when facing short-selling threats, as managers have greater discretion to pursue their own interests. Conversely, firms with governance mechanisms that align managerial and shareholder interests-such as higher management ownership-may be better positioned to resist short-term pressure and maintain long-term value creation.

Additionally, managerial attributes may moderate the relation between short selling and green innovation. Managers with environmental expertise may recognize that genuine environmental commitment creates long-term competitive advantage, enabling them to withstand short-term pressure and maintain substantive green innovation efforts[1]. Similarly, firms facing stronger external monitoring-such as higher analyst coverage-may experience greater pressure to demonstrate environmental responsibility, potentially amplifying the quantity effect.

This reasoning contributes to our second hypothesis:

Hypothesis 2: The effects of short selling on green innovation are moderated by firm governance characteristics, managerial attributes, and external monitoring intensity.

3. Research Design

3.1 Sample Selection and Data Sources

We observe financial data from the China Stock Market and Accounting Research (CSMAR) database, the most comprehensive database for Chinese listed firms. Green patent data are obtained from the Chinese Research Data Services (CNRDS) platform, which provides detailed information on patent applications and grants classified by technology type. Following prior research, we identify green patents based on International Patent Classification (IPC) codes corresponding to environmentally friendly technologies as defined by the World Intellectual Property Organization's Green Inventory.

3.2 Variable Measurement

3.2.1 Green Innovation

We measure green innovation using patent-based indicators, which are widely used in innovation research because patents reflect innovation output, are publicly disclosed, and contain detailed information about technological content.

3.2.2 Short Selling Treatment

China's margin trading program was introduced in March 2010 with an initial list of 90 eligible stocks, subsequently expanded in multiple batches. This staggered implementation provides a quasi-natural experimental setting where firms become eligible for short selling at different times.

3.2.3 Control Variables

Growth opportunities (*TobinQ*) is market value divided by book value of assets. Cash flow (*Cashflow*) is operating cash flow divided by total assets. Firm age (*Age*) is the natural logarithm of years since listing. Board size (*Board*) is the natural logarithm of the number of directors. Independent director ratio (*Indep*) is the number of independent directors divided by total directors. State ownership (*SOE*) is an

indicator variable equal to one for state-owned enterprises. Analyst coverage (*Analyst*) is the natural logarithm of one plus the number of analysts following the firm. R&D intensity (*RD*) is research and development expenditure divided by total assets. Table 1 presents detailed variable definitions.

Table 1. Variable Definitions

Variable*	**Symbol***	**Definition***
Total Green Applications	TGA	Ln(1 + total green patent applications)
Total Green Grants	TGG	Ln(1 + total green patent grants)
Green Invention Applications	GIA	Ln(1 + green invention patent applications)
Green Utility Applications	GUA	Ln(1 + green utility model patent applications)
Treatment	Treat	1 if firm ever in margin trading program
Post	Post	1 for years after program inclusion
Firm Size	Size	Ln(total assets)
Leverage	Lev	Total liabilities / total assets
Profitability	ROA	Net income / total assets
Growth	TobinQ	Market value / book value of assets
CashFlow	Cashflow	Operating cash flow / total assets
Firm Age	Age	Ln(years since listing)
Board Size	Board	Ln(number of directors)
Independent Directors	Indep	Independent directors / total directors
State Ownership	SOE	1 for state-owned enterprises
Analyst Coverage	Analyst	Ln(1 + number of analysts)
R&D Intensity	RD	R&D expenditure / total assets

4. Empirical Results

4.1 Descriptive Statistics

Table 2 presents descriptive statistics for the main variables. The mean value of total green patent applications (TGA) is 0.342, with substantial variation across firms (standard deviation 0.721). Green invention applications (GIA) average 0.218, lower than green utility applications (GUA) at 0.251, suggesting that firms engage in more incremental than breakthrough green innovation on average. Approximately 34.2% of firm-year observations are treated (i.e., firms eligible for short selling), reflecting the phased expansion of the margin trading program.

Table 2. Descriptive Statistics

Variable	N	Mean	SD	P25	Median	P75
TGA	24,873	0.342	0.721	0.000	0.000	0.693
TGG	24,873	0.298	0.652	0.000	0.000	0.693
GIA	24,873	0.218	0.542	0.000	0.000	0.000
GUA	24,873	0.251	0.586	0.000	0.000	0.693
Treat×Post	24,873	0.231	0.422	0.000	0.000	0.000
Size	24,873	22.341	1.324	21.432	22.156	23.087
Lev	24,873	0.432	0.206	0.268	0.423	0.587
ROA	24,873	0.037	0.062	0.013	0.035	0.064
TobinQ	24,873	2.013	1.342	1.184	1.623	2.341
SOE	24,873	0.356	0.479	0.000	0.000	1.000
Analyst	24,873	1.876	1.234	0.693	1.946	2.833
RD	24,873	0.018	0.023	0.002	0.012	0.026

4.2 Main Results: Short Selling and Green Innovation

Table 3 reports the baseline DID results examining the relationship between short selling and green innovation. Columns (1) and (2) present results for green innovation quantity (total applications and grants), while columns (3) and (4) distinguish between invention patents (quality) and utility patents.

The results reveal a striking pattern. The coefficient on Treat×Post is positive and statistically significant for total green patent applications (0.042, t=3.21) and total green patent grants (0.035, t=2.54), indicating that short-selling eligibility increases the quantity of

green innovation output. This finding supports Hypothesis 1a and aligns with studies documenting that short selling can stimulate observable green activities[3][6].

Table 3. Short Selling and Green Innovation: Baseline Results

Variable	(1) TGA	(2) TGG	(3) GIA	(4) GUA
Treat×Post	0.042***	0.035**	0.008	0.038***
	(3.21)	(2.54)	(0.87)	(3.42)
Size	0.156***	0.143***	0.112***	0.121***
	(12.43)	(11.87)	(10.34)	(10.87)
Lev	–0.087**	–0.076*	–0.054	–0.062*
	−2.21	−1.94	−1.52	−1.78
ROA	0.234***	0.198**	0.167**	0.154**
	(2.87)	(2.43)	(2.21)	(2.09)
TobinQ	0.023***	0.019**	0.015**	0.016**
	(3.45)	(2.98)	(2.43)	(2.56)
SOE	0.031	0.028	0.035*	0.018
	(1.43)	(1.32)	(1.76)	(0.98)
Analyst	0.045***	0.041***	0.032***	0.036***
	(5.43)	(5.12)	(4.43)	(4.87)
RD	3.542***	3.213***	2.876***	2.543***
	(8.76)	(8.21)	(7.65)	(6.98)
Firm-FE	Yes	Yes	Yes	Yes
Year-FE	Yes	Yes	Yes	Yes
Observations	24,873	24,873	24,873	24,873
Adj-R^2	0.342	0.328	0.312	0.319

*Note: t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Standard errors clustered at firm level.*

However, when we distinguish between innovation types, a more nuanced picture emerges. The coefficient for green invention patents-our proxy for innovation quality-is small and statistically insignificant (0.008, t=0.87). In contrast, the coefficient for green utility patents-capturing incremental, lower-quality innovation-is positive and highly significant (0.038, t=3.42). These results support Hypothesis 1b: short selling increases the quantity but not the quality of green innovation. Firms respond to short-selling pressure by filing more green patent applications, but these additional applications are concentrated in lower-quality utility models rather than substantive invention patents.

This pattern is consistent with the interpretation that short-selling pressure induces strategic behavior: firms engage in observable green activities to signal environmental responsibility to stakeholders, but avoid committing to the risky, long-term investments required for breakthrough green innovation. The finding also helps reconcile conflicting evidence in prior literature, suggesting that studies finding positive effects may be capturing quantity increases, while those finding negative effects may be capturing quality deterioration.

4.3 Parallel Trends and Dynamic Effects

To assess this assumption and examine the dynamic evolution of treatment effects, we estimate an event study specification that replaces the single Treat×Post indicator with a series of indicators for years relative to program inclusion.

Following treatment, the coefficients become positive and grow over time, suggesting that the quantity effect strengthens as firms have more experience with short-selling pressure. For invention applications, pre-treatment coefficients are also insignificant, but post-treatment coefficients remain near zero throughout, confirming that short selling does not enhance-and does not significantly reduce-green innovation quality.

4.4 Mechanism Analysis

Our baseline results suggest that short selling increases green innovation quantity without improving quality. To understand the mechanisms driving these effects, we examine two potential channels: managerial short-sightedness and strategic signaling.

4.4.1 Managerial Short-Sightedness

If short-selling pressure induces managerial short-termism, we would expect the quantity-quality divergence to be more pronounced in firms where managers face stronger short-term incentives. We proxy for managerial short-sightedness using the proportion of short-term institutional investors (those with high portfolio turnover), following prior research. Firms with more short-term investors face greater pressure to deliver immediate results, potentially exacerbating short-termism.

Table 4 presents results stratified by the level of short-term institutional ownership. For firms with above-median short-term ownership, the Treat×Post coefficient for total applications is 0.058 (t=3.54), while the coefficient for invention applications remains insignificant (0.004, t=0.32). For firms with below-median short-term ownership, the quantity effect is smaller (0.029, t=1.98) and the quality effect remains insignificant.

4.4.2 Strategic Signaling

If firms increase green patent filings to signal environmental responsibility, we would expect the quantity effect to be stronger when stakeholder pressure for environmental performance is higher. We examine this prediction by stratifying on environmental regulatory pressure.For these firms, the coefficient for total applications is 0.067 (t=4.21), more than double that for non-heavy polluters (0.023, t=1.76). This pattern supports the strategic signaling interpretation: firms facing greater environmental scrutiny respond to short-selling pressure by increasing observable green activities.

Table 4. Mechanism Analysis: Heterogeneity in Treatment Effects

Sample	Total Applications	Invention Applications	Observations
High short-term ownership	0.058*** (3.54)	0.004 (0.32)	12,187
Low short-term ownership	0.029** (1.98)	0.011 (0.87)	12,686
Heavy polluters	0.067*** (4.21)	0.012 (0.93)	8,432
Non-heavy polluters	0.023* (1.76)	0.006 (0.54)	16,441

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

4.5 Heterogeneity Analysis

We next examine how firm characteristics moderate the relationship between short selling and green innovation, testing Hypothesis 2.

4.5.1 State Ownership

State-owned enterprises (SOEs) face different institutional environments and incentive structures than non-SOEs. SOEs may be less responsive to market-based disciplinary mechanisms like short selling due to softer budget constraints, political objectives that temper profit maximization, and greater job security for managers. Table 5 reports results stratified by ownership type.

For non-SOEs, the quantity effect is strong and significant (0.056, t=3.87), while the quality effect remains insignificant (0.009, t=0.76). For SOEs, both quantity and quality effects are insignificant. This pattern suggests that market discipline operates more powerfully in the private sector, where managers face stronger consequences for stock price declines.

4.5.2 Analyst Coverage

we expect stronger responses to short-selling threats as any negative developments are more likely to be identified and communicated to investors.

Results in Table 5 confirm this prediction. For firms with above-median analyst coverage, the quantity effect is substantial (0.061, t=4.12). For firms with below-median coverage, the effect is smaller and only marginally significant (0.024, t=1.83). The quality effect remains insignificant in both groups.

4.5.3 Management Ownership

Higher management ownership aligns managerial interests with shareholder interests, potentially mitigating short-termism induced by short-selling pressure. Consistent with this reasoning, we find that the quantity-quality divergence is attenuated in firms with high management ownership.

Table 5. Heterogeneity Analysis: Moderating Factors

Sample	**Total Applications**	**Invention Applications**	**Observations**
Panel A:State Ownership			
Non-SOE	0.056***-(3.87)	0.009-(0.76)	16,023
SOE	0.018-(1.21)	0.006-(0.43)	8,850
Panel B:Analyst Coverage			
High coverage	0.061***-(4.12)	0.011-(0.89)	12,543
Low coverage	0.024*-(1.83)	0.005-(0.41)	12,330
Panel C:Management Ownership			
High ownership	0.032**-(2.23)	0.014-(1.08)	12,098
Low ownership	0.051***-(3.34)	0.003-(0.26)	12,775

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

4.6 CEO Environmental Experience as a Mitigating Factor

Recent research suggests that managerial attributes shape how firms respond to external pressures[1][9]. CEOs with environmental expertise may better understand that genuine environmental commitment creates long-term competitive advantage, enabling them to resist short-term pressure and maintain substantive

green innovation.

We identify CEOs with environmental experience based on biographical information indicating prior work in environmentally related industries, environmental regulation, or sustainability-focused organizations. Table 6 presents results stratified by whether the firm has an environmentally experienced CEO.

Table 6. The Role of CEO Environmental Experience

Variable	Firms with Env·CEO	Firms without Env·CEO		
	TGA	GIA	TGA	GIA
Treat×Post	0.028*	0.024*	0.048***	0.003
	(1.89)	(1.76)	(3.54)	(0.28)
Controls	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	5,432	5,432	19,441	19,441
Adj. R2	0.351	0.334	0.338	0.317

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

The results reveal striking differences. For firms without environmentally experienced CEOs, the pattern mirrors our main findings: significant quantity effect (0.048, t=3.54) but no quality effect (0.003, t=0.28). For firms with environmentally experienced CEOs, both quantity and quality effects are positive and marginally significant (0.028 and 0.024, respectively). While the quality effect is modest in magnitude, it suggests that managerial expertise can partially mitigate the tendency toward strategic rather than substantive green innovation under short-selling pressure.

This finding has important implications: the governance effects of market mechanisms like short selling are not deterministic but interact with firm-specific characteristics. Policies that encourage environmentally experienced leadership may enhance the effectiveness of market discipline in promoting genuine green transformation.

4.7 Robustness Checks

4.7.1 Alternative Measures of Green Innovation

Our main analysis uses patent applications as the primary innovation measure. As a robustness check, we re-estimate using patent grants, which may better capture successfully commercialized innovations but introduce timing uncertainty (grants may occur years after application). Results using grants are qualitatively similar to those using applications, with significant quantity effects and insignificant quality effects.

4.7.2 Placebo Tests

To ensure our results are not driven by spurious correlations, we conduct placebo tests by artificially assigning treatment years. Specifically, we shift each treated firm's inclusion year backward by two, three, and four years, then re-estimate the DID model. Placebo treatment indicators are insignificant across all specifications.

4.7.3 Propensity Score Matching

We match treated firms to control firms based on size, leverage, profitability, and industry in the year before treatment, then re-estimate our models on the matched sample. Results are consistent with the main findings.

4.7.4 Excluding Other Policies

Our sample period includes other policy changes that might affect green innovation, including environmental regulations and green credit policies. To ensure our results are not confounded, we sequentially exclude years surrounding major environmental policy implementations and include policy interaction terms. The main results remain robust.

5. Conclusion and Implications

5.1 Summary of Findings

This study may not significantly affect-innovation quality. Firms respond to short-selling pressure by filing more green patent applications, particularly lower-quality utility models, while failing to increase substantive invention patents that capture breakthrough innovation.

5.2 Theoretical Contributions

This study leads to multiple literature streams. we advance understanding of short selling's governance effects by distinguishing between innovation quantity and quality, revealing that market discipline can have heterogeneous effects on different dimensions of corporate behavior. This nuanced perspective helps reconcile conflicting findings in prior research and suggests that simple linear characterizations of short selling as uniformly beneficial or harmful are inadequate.

5.3 Policy Implications

First, policymakers should recognize that market-based mechanisms like short selling are

not panaceas but tools whose effects depend on implementation context. The finding that short selling increases green innovation quantity without improving quality suggests that additional policy interventions may be needed to channel market discipline toward substantive environmental outcomes.

Second, policies that enhance firms' capacity for genuine green innovation-such as supporting environmentally experienced leadership and aligning managerial incentives through ownership-can complement market discipline. The finding that environmentally experienced CEOs mitigate the quality deficit suggests that human capital development should accompany capital market reform.

Third, environmental regulators and securities regulators should coordinate their efforts. The stronger quantity effects in heavily polluting industries suggest that environmental scrutiny and market discipline can work synergistically, but coordination is needed to ensure that this synergy produces substantive rather than symbolic outcomes.

5.4 Limitations and Future Research

This study has several limitations that suggest directions for future research. First, we focus on China's institutional context, which may limit generalizability to other settings with different governance structures and environmental regulations. Future research could examine whether similar patterns emerge in other emerging markets or developed economies.

References

[1] Wu, G.Z., & You, D.M. (2022). Can margin trading promote corporate green innovation? A quasi-natural experiment based on Chinese listed companies. China Soft Science, (4), 172-183.

[2] Hou, D.S., Dong, M.R., & Zhou, T.T. (2025). Does short selling affect corporate green transformation? Evidence from China. Research in International Business and Finance, 72, 102-118.

[3] Chen, X.Y., Zhu, J.H., & Liu, S. (2024). Deregulation of short-selling and green innovation of enterprises: Quasi-natural experiment of margin trading policy. Nankai Business Review International, 15(3), 502-541.

[4] Liu, C. (2022). Does green credit policy induce strategic information disclosure behavior of heavily polluting enterprises? A quasi-natural experiment based on the Green Credit Guidelines. Wuhan Finance, (10), 3-13.

[5] Shi, S.P., Li, Z.Y., & Zhang, C.Y. (2025). Does short-selling threat affect corporate environmental information disclosure? From the perspective of stakeholder theory. Friends of Accounting, (7), 78-86.

[6] He, J., & Tian, X. (2013). The dark side of analyst coverage: The case of innovation. Journal of Financial Economics, 109(3), 856-878.

[7] Fama, E.F., & French, K.R. (1993). Common risk factors in the returns on stocks and bonds. Journal of Financial Economics, 33(1), 3-56.

[8] Hou, K., Xue, C., & Zhang, L. (2015). Digesting anomalies: An investment approach. Review of Financial Studies, 28(3), 650-705.

[9] Chen, C., Doukas, J.A., & Zhang, R.G. (2025). Are CSR incidents truly bad news? Journal of Financial Research, 48(4), 1-34.

[10] Flammer, C. (2013). Corporate social responsibility and shareholder reaction: The environmental awareness of investors. Academy of Management Journal, 56(3), 758-781.

[11] Krüger, P. (2015). Corporate goodness and shareholder wealth. Journal of Financial Economics, 115(2), 304-329.

[12] Albuquerque, R., Koskinen, Y., & Zhang, C. (2019). Corporate social responsibility and firm risk: Theory and empirical evidence. Management Science, 65(10), 4451-4469.

[13] Baron, D.P. (2008). Managerial contracting and corporate social responsibility. Journal of Public Economics, 92(1-2), 268-288.

[14] Gillan, S.L., Koch, A., & Starks, L.T. (2021). Firms and social responsibility: A review of ESG and CSR research in corporate finance. Journal of Corporate Finance, 66, 101889.

