

Directors and Officers Liability Insurance and Corporate ESG Performance

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Abstract. Driven by both policy initiatives and the need for corporate sustainable development, Directors and Officers Liability Insurance (D&O insurance) has emerged as a key governance tool to balance the long-term value of ESG with short-term interest conflicts. Based on data from Chinese A-share listed companies from 2009 to 2023, this paper empirically examines the impact of D&O insurance on corporate ESG performance and its underlying mechanisms. The study finds: First, purchasing D&O insurance significantly improves corporate ESG performance, and this promotion is achieved by enhancing the quality of environmental information disclosure. Second, heterogeneity analysis shows that the promoting effect of D&O insurance on ESG is more significant in non-high-tech enterprises and state-owned enterprises. The research reveals the governance path through which D&O insurance optimizes corporate ESG practices by strengthening information disclosure, providing theoretical support for ESG risk management and innovations in corporate governance mechanisms.

Keywords: Directors and Officers Liability Insurance; Corporate ESG Performance; Environmental Information Disclosure; Principal-Agent Conflict; Corporate Governance.

1. Introduction and Literature Review

The Report to the 20th National Congress of the Communist Party of China clearly states that "promoting the green and low-carbon development of the economy and society is a key link in achieving high-quality development," a policy orientation highly aligned with ESG concepts. This has driven listed companies in China to deeply integrate ESG practices into their strategic planning (Xie Tingting, Yang Bing'en, Song Cheng, 2024)[2]. ESG (Environmental, Social, and Governance) is an investment philosophy and corporate evaluation standard that focuses on a company's environmental, social, and governance performance rather than traditional financial performance. Improving ESG performance plays a significant role in the long-term stable and healthy development of enterprises (Ma Yaming et al., 2024)[1]. Studies show that ESG helps with enterprise management planning, reduces operating costs, enhances customer trust, maintains customer loyalty, and improves business performance (Li Qian, 2025)[3]. Therefore, examining the influencing factors of corporate ESG performance and exploring the underlying mechanisms are of great significance.

As a specialized insurance product, Directors and Officers Liability Insurance (D&O insurance) transfers legal risks in executives' duties, providing litigation costs and civil compensation guarantees for corporate managers. It combines risk mitigation with governance efficiency optimization. Research indicates that D&O insurance can reduce the decision-making fault-tolerance costs of management, incentivize innovative performance of duties, and improve the external supervision mechanism of capital markets (Song Cheng, 2025)[14]. Thus, the relationship between D&O insurance and corporate ESG performance has attracted significant academic attention.

Existing literature suggests that D&O insurance can enhance enterprises' willingness to implement ESG concepts by transferring the risks of ESG investment. As a type of liability insurance, D&O insurance aims to compensate directors, supervisors, and senior managers for personal liability losses caused by negligence or improper conduct in daily duties. D&O insurance promotes ESG investment by reducing a company's agency costs (Zhang Xianhua, Wang Bin, 2025)[10]. On the one hand, D&O insurance encourages ESG investment and corporate innovation by reducing executives' decision-making risks (Hu Guoliu, Zhao Yang, Hu Jun, 2019)[11]. On the other hand,

it improves corporate governance structures through external supervision and reduces information asymmetry between internal and external stakeholders (Luo Yan, Fu Qianxi, 2024)[12]. D&O insurance also enhances the quality of corporate information disclosure to some extent through external regulation (Zhou Lan, Xiao Sihui, 2024)[13].

The potential contributions of this paper are as follows: First, it explores the impact of D&O insurance on corporate ESG performance, enriching and expanding research on the governance effects of D&O insurance and establishing a research framework for D&O insurance and corporate sustainable development. Second, the theoretical analysis suggests that, based on incentive effects and opportunism, D&O insurance in China currently serves more as an incentive tool rather than a mere risk transfer mechanism under the background of environmental regulations. Third, combining China's institutional context of strengthened environmental regulations and ESG, this paper proposes a theoretical model of D&O insurance promoting ESG performance through "optimization of environmental information disclosure," providing empirical evidence for deepening the understanding of D&O insurance governance mechanisms and enterprises' approaches to strengthening stakeholder engagement.

2. Theoretical Analysis and Research Hypotheses

2.1 D&O Insurance as an Incentive Tool Influencing Corporate ESG Performance

D&O insurance serves as a critical risk management strategy, significantly impacting executives' risk tolerance and corporate risk strategies by transferring risks to external institutions. Existing research on D&O insurance primarily involves two hypotheses: the incentive effect and opportunism. The incentive effect hypothesis posits that D&O insurance, as a corporate risk-hedging tool, helps adjust managers' risk-averse behavior [15], encouraging them to actively assume risks. This enables managers to prioritize decisions that enhance long-term corporate value during decision-making, including indicators like ESG with longer payback periods and higher costs [16], thereby aligning the goals of shareholders and management [17]. Additionally, reducing information asymmetry between the enterprise and stakeholders may mitigate issues such as adverse selection and moral hazard, potentially preventing "greenwashing" [18]. Based on the above analysis, this paper proposes:

Hypothesis 1: Purchasing D&O insurance is conducive to improving corporate ESG performance.

The opportunism hypothesis, however, suggests that D&O insurance allows management to "land safely" when facing litigation risks, making them more reckless in business decisions, violating the principle of prudence, and triggering moral hazards. However, under China's current environmental regulatory framework, insurance cannot fully transfer the litigation risks faced by executives, particularly for severe environmental violations. This implies that even with D&O insurance, management must still exercise caution in ESG-related matters (e.g., environmental protection) to avoid illegal activities and severe penalties. Therefore, we argue that D&O insurance in China functions more as an incentive tool than a mere risk transfer mechanism.

2.2 The Role of Corporate Environmental Information Disclosure Quality in the Impact of D&O Insurance on ESG Performance

Corporate transparency reflects the extent and quality of information disclosure, which helps stakeholders understand key information about the enterprise's operational status, financial conditions, environmental impact, social contributions, and governance structure, thereby enhancing trust and support. Purchasing D&O insurance is equivalent to introducing professional external supervisors, which improves the quality of information disclosure.

On one hand, when an enterprise purchases D&O insurance, the insurance company, as a stakeholder, conducts pre-purchase evaluations and post-purchase supervision of the listed company. With growing environmental awareness, the environmental information disclosed by enterprises—reflecting pollution levels and potential environmental risks—has drawn attention from various

stakeholders, including governments, investors, and consumers, leading to a significant increase in litigation related to environmental pollution. If an enterprise fails to disclose environmental information accurately and timely, the insurance company must bear litigation risks and compensate for losses. Before underwriting, insurance companies conduct detailed investigations into executives' risk profiles, the enterprise's operational status, environmental protection records, the quality of environmental information disclosure, and negative environmental reports, and set premiums based on environmental risk levels. To successfully obtain insurance and secure lower premiums, enterprises will proactively adopt environmentally friendly production practices and improve the quality of environmental information disclosure [19], thereby enhancing ESG performance. After underwriting, insurance companies continue to monitor the enterprise's operations using their professional expertise [20].

On the other hand, with D&O insurance coverage, management is more willing to disclose the enterprise's environmental information. Before purchasing D&O insurance, stakeholders can only understand the enterprise through information disclosed in external markets. After purchasing insurance, a third-party insurance company is introduced, whose comprehensive analysis results are highly professional and credible. Stakeholders can also assess the enterprise's true operational status by examining the clauses in the insurance contract [23].

Based on the above analysis, this paper proposes:

Hypothesis 2: D&O insurance promotes ESG performance by improving the quality of corporate environmental information disclosure.

3. Research Design

3.1 Model Construction

To examine the relationship between corporate D&O insurance purchases and ESG performance, this paper constructs the following regression model with reference to the approach of Ma Yaming and Xu Huijie (2025):

$$ESG = \beta_0 + \beta_1 DO_i + Controls_i + \delta_i$$

The model uses ordinary least squares (OLS) regression. Here, the explained variable ESG represents the corporate ESG performance, and the main explanatory variable DO_i indicates whether the company has purchased directors and officers liability insurance. $Controls_i$ represents all control variables, and ε is the random disturbance term. Referring to Shi Xinzhen et al. (2019) and Wu Cen (2022), the control variables include company size (Size), firm age (Age), management shareholding ratio (Mshare), asset-liability ratio (Lev), return on assets (Roa), growth (Growthth), board size (Board), proportion of independent directors (Indep), and equity nature (SOE). Table 1 presents the definitions of the main variables in this paper.

3.2 Variable Definitions

3.2.1 Explained Variable: ESG Performance

To comprehensively consider corporate ESG performance and measure it objectively from environmental, social, and governance aspects, this paper refers to the research of Ma Lingyuan and You Hang and selects Huazheng ESG rating data as the measure of corporate ESG performance. The Huazheng ESG rating system, combining international mainstream methods and practical experience and based on China's actual situation, divides corporate ESG performance into nine levels, from lowest to highest: C, CC, CCC, B, BB, BBB, A, AA, and AAA. In this paper, these levels are assigned values from 1 to 9 in ascending order of quality.

3.2.2 Explanatory Variable

Directors and Officers Liability Insurance (DO). Chinese laws and regulations do not explicitly require enterprises to disclose information on D&O insurance purchases. The main methods to

determine whether an enterprise has purchased D&O insurance are as follows: first, based on the insurance-purchase information released by the listed company; second, based on whether the annual or semi-annual financial statements of the enterprise disclose expenses related to D&O insurance; third, by checking whether the enterprise's articles of association mention clauses for purchasing liability insurance for directors, supervisors, and senior management. Referring to the research of Yu Lianchao et al. (2024) [28], this paper uses a dummy variable to measure it. If an enterprise purchases D&O insurance in a given year, the value is 1; otherwise, it is 0.

3.2.3 Mediating Variable

Corporate Environmental Information Disclosure Quality (EIDQ). Referring to the research of Kong Dongmin et al. (2021) [29], this paper obtains environmental information disclosure data of sample enterprises from the CSMAR environmental research database and classifies environmental information disclosure by enterprises according to whether it is monetized: indicators in environmental liability disclosure, environmental performance and governance disclosure belong to monetized information, while indicators in environmental management disclosure, environmental certification disclosure, and environmental information disclosure carriers belong to non-monetized information. For monetized information, if it is disclosed by combining quantitative and qualitative methods, the value is 2; if it is qualitative, the value is 1; if not disclosed, the value is 0. For non-monetized information, if disclosed, the value is 2; if not disclosed, the value is 0. After scoring all 25 items, the scores are summed up and logarithmically transformed. The resulting data is EIDQ. The higher the EIDQ value, the more complete the environmental information disclosed by the enterprise, and the higher the quality of the enterprise's environmental information disclosure.

3.2.4 Control Variables

Referring to previous research, the control variables in this paper are as follows: company size (Size), firm age (Age), management shareholding ratio (Mshare), asset-liability ratio (Lev), return on assets (Roa), growth (Growth), board size (Board), proportion of independent directors (Indep), and equity nature (SOE). The definitions and indicator selections of the variables are shown in Table 1.

Table 1 Definitions and Indicator Selections of Variables

Variable Type	Variable Name	Variable Code	Indicator Selection
Explained Variable	Corporate ESG Performance	ESG	Assigned values from 1-9 according to Huazheng ESG ratings from low to high
Explanatory Variable	Directors and Officers Liability Insurance	DO	1 if the enterprise purchases D&O insurance, 0 otherwise
Mediating Variable	Corporate Environmental Information Disclosure Quality	EIDQ	Composed of 25 indicators in five aspects: environmental management disclosure, environmental certification disclosure, environmental information disclosure carriers, environmental liability disclosure, and environmental performance and governance disclosure. For non-monetized information, if one item is disclosed, it is 2, otherwise 0; for monetized information, if it has both quantitative and qualitative descriptions, it is 2, if only qualitative description, it is 1, if no description, it is 0. Sum the scores of 25 indicators and take the logarithm to obtain this variable
Control Variables	Company Size	Size	Natural logarithm of the enterprise's total assets

	Firm Age	Age	Natural number of the years since the company's establishment
	Management Shareholding Ratio	Mshare	Number of shares held by management / total number of shares at the end of the period
	Asset-Liability Ratio	Lev	Total liabilities at the end of the year / total assets at the end of the year
	Return on Assets	Roa	Net profit / total assets
	Growth	Growth	Revenue growth rate
	Board Size	Board	Logarithm of the number of board members
	Proportion of Independent Directors	Indep	Number of independent directors / total number of board members
	Equity Nature	SOE	1 for state-owned enterprises, 0 for others

3.3 Sample Selection and Data Sources

This paper selects Chinese A-share listed companies from 2009-2023 as the initial sample and processes them according to the following principles: first, delete samples of ST-type and financial companies; second, delete samples with an asset-liability ratio less than 0 or greater than 1; third, to avoid the influence of extreme values, perform 1% bilateral winsorization on continuous data. Finally, 33,879 observation samples of [number of enterprises] enterprises are obtained.

4. Empirical Results and Analysis

4.1 Descriptive Statistics and Correlation Tests

Table 1 reports the descriptive statistics of the main variables in this paper. The mean value of the explained variable ESG is 73.49, the standard deviation is 5.112, the maximum value is 92.93, and the minimum value is 36.62, indicating that there are significant differences in ESG performance among different enterprises, and very few enterprises can obtain the highest ESG rating of AAA. The mean value of the explanatory variable DO is approximately 0.0960, indicating that about 9.6% of the enterprises in the sample have purchased directors and officers liability insurance.

Table 2 Descriptive Statistics of Main Variables

Variable Name	Sample Size	Mean	Median	Standard Deviation	Minimum Value	Maximum Value
DO	33879	0.0960	0	0.295	0	1
ESG	33879	73.49	73.74	5.112	36.62	92.93
EIDQ	5724	1.116e+06	100	4.979e+07	-1717	3.662e+09
Size	33879	2.056e+10	3.973e+09	9.494e+10	3.698e+07	2.733e+12
Age	33879	30.41	31	3.868	23	36
Mshare	33879	13.99	0.769	20.00	0	89.72
Lev	33879	0.423	0.417	0.208	0.00700	2.529
Roa	33879	0.0400	0.0400	0.0750	-1.856	0.644
Growth	33879	1.292	0.126	57.59	-41.58	8413
Board	33879	8.612	9	1.754	0	18
Indep	33879	37.54	36.36	5.577	0	80

4.2 Regression Results and Analysis

The Relationship between D&O Insurance and ESG. To test the impact of purchasing D&O insurance on corporate ESG performance, this paper conducts a regression on the full sample according to Model (1) based on whether the enterprise has purchased D&O insurance. The specific regression results are shown in Table 1. The results show that the coefficient of the D&O insurance indicator (DO) is significantly positive at the 1% level, indicating that after purchasing D&O insurance, the corporate ESG performance will improve. In terms of economic significance, the regression coefficient of whether to purchase D&O insurance is 0.584. The above results show that purchasing D&O insurance can significantly improve corporate ESG performance, which confirms Hypothesis 1 of this paper.

Corporate investment in ESG will affect short-term profits and bring certain risks. The short-sightedness of corporate management and the tendency to avoid risks have inhibited corporate investment in ESG. After purchasing D&O insurance, the risks brought by corporate ESG investment are transferred to the insurance company through D&O insurance. On the one hand, D&O insurance reduces the agency cost of the enterprise and increases its willingness to invest in ESG. On the other hand, the external supervision of D&O insurance on the enterprise improves the quality of corporate information disclosure. Under the dual effects of cost reduction and external supervision, enterprises will inevitably increase their investment in ESG, thereby enhancing ESG performance.

Table 3 Directors and Officers Liability Insurance and Corporate ESG Performance: Basic Regression

Variables	(1) ESG
DO	0.584*** (0.0930)
Age	-0.0189 (0.0561)
Mshare	0.0118*** (0.00146)
Lev	-1.575*** (0.165)
Roa	15.10*** (0.555)
Growth	-0.0541 (0.0398)
Board	0.213*** (0.0186)
Indep	0.0883*** (0.00572)
Constant	66.19*** (2.084)
Observations	29,967
R-squared	0.151

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

4.3 Mechanism Tests

The previous regression results have confirmed the promoting effect of D&O insurance on corporate ESG performance. In the theoretical analysis, this paper pointed out that this promoting effect is because D&O insurance can increase external supervision and reduce agency costs, thereby promoting corporate ESG performance. Specifically, the external supervision of D&O insurance on enterprises improves the quality of corporate environmental information disclosure. Since "environment" is the first assessment criterion in ESG, the ESG performance of enterprises will also increase accordingly. Meanwhile, the quality of corporate information disclosure directly affects investors' willingness and efficiency of investment. With the popularization and development of the ESG concept, all sectors of society are paying more and more attention to corporate ESG performance, which in turn increases the motivation for enterprises to improve the quality of environmental information disclosure, forming a virtuous cycle [31]. To provide more reliable evidence for the conclusions of this paper, we further test whether D&O insurance can increase external supervision.

The external supervision of D&O insurance on enterprises improves the quality of corporate environmental information disclosure. To test this mechanism, referring to the approach of Kong Dongmin et al. (2021), this paper classifies enterprises' environmental information disclosure according to whether it is monetized. Among them, environmental liability disclosure, etc. belong to monetized information, and environmental management disclosure, etc. belong to non-monetized information. After summing up the scores of these items and taking the logarithm, we obtain EIDQ, an indicator that comprehensively reflects the quality of corporate environmental information disclosure [32]. Table 4 shows the results of the mechanism test. Column (1) shows the results of the mechanism test for corporate environmental information disclosure. The regression results show that the coefficient of DO is significantly positive, indicating that enterprises purchasing D&O insurance can improve the degree of environmental information disclosure.

Table 4 Mechanism Tests

Variables	(1) EIDQ
DO	0.247*** (0.0162)
Age	0.114*** (0.0106)
Mshare	-0.00446*** (0.000254)
Lev	0.504*** (0.0275)
Roa	1.142*** (0.0641)
Growth	-0.000130* (7.88e-05)
Board	0.0642*** (0.00314)
Indep	0.00646*** (0.000926)
Constant	-2.978*** (0.389)
Observations	33,878
R-squared	0.370

4.4 Heterogeneity Analysis

(1) Grouping Test Based on Whether an Enterprise Is a High-Tech Enterprise

Table 5 shows the promoting effect of purchasing D&O insurance on corporate ESG performance when an enterprise is or is not a high-tech enterprise. As shown in Table 3, under different grouping conditions, the coefficient of the D&O insurance indicator (DO) is significantly positive, indicating that D&O insurance can promote ESG performance regardless of whether an enterprise is a high-tech enterprise. When an enterprise is not a high-tech enterprise, the coefficient value of the D&O insurance indicator is larger, meaning that when an enterprise is not a high-tech enterprise, the promoting effect of D&O insurance on ESG performance is more significant. The results in Table 3 imply that when an enterprise is not a high-tech enterprise, D&O insurance generates a stronger willingness to invest in ESG and a more pronounced promoting effect on ESG performance.

(2) Grouping Test Based on Whether an Enterprise Has State-Owned Equity

Table 5 reports the varying degrees of the effect of D&O insurance on promoting ESG performance in enterprises with state-owned equity and those without. The coefficient value of the D&O insurance indicator in column (3) is 1.140 and is significant at the 1% level; the coefficient value of the D&O insurance indicator in column (4) is 0.445, which is lower than that in column (3). The results show that the improvement of ESG performance by D&O insurance in enterprises with state-owned equity is significantly higher than that in enterprises without state-owned equity.

Table 5 Heterogeneity Tests

Variable Name	(1)	(2)	(3)	(4)
	High-tech Enterprises	Non-high-tech Enterprises	Enterprises with State-owned Equity	Enterprises without State-owned Equity
DO	0.597*** (0.151)	1.267*** (0.168)	1.140*** (0.126)	0.445*** (0.141)
Size	0*** (0)	0*** (0)	0*** (0)	0*** (0)
Age	-0.164 (0.357)	-0.0904 (0.125)	-0.309** (0.128)	-0.00577 (0.0710)
Mshare	0.0149*** (0.00198)	0.0136*** (0.00324)	-0.0225 (0.0140)	0.0197*** (0.00163)
Lev	-2.216*** (0.230)	-1.896*** (0.299)	-0.795*** (0.280)	-2.791*** (0.201)
Roa	10.98*** (0.511)	10.11*** (0.689)	13.71*** (0.855)	10.49*** (0.415)
Growth	-0.000541 (0.000503)	-0.00445*** (0.00144)	0.00104 (0.00151)	-0.000967** (0.000483)
Board	0.301*** (0.0276)	0.267*** (0.0333)	0.216*** (0.0251)	0.215*** (0.0271)
Indep	0.0806*** (0.00802)	0.118*** (0.00964)	0.114*** (0.00797)	0.0695*** (0.00747)
Constant	72.08*** (12.89)	65.42*** (4.522)	73.63*** (4.643)	66.49*** (2.663)
Observations	15,878	10,217	11,858	22,021
R-squared	0.121	0.216	0.228	0.149

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

5. Conclusions

Based on data from Shanghai and Shenzhen A-share listed companies from 2009 to 2023, this paper empirically examines the impact of directors and officers liability insurance on corporate ESG performance. The main research conclusions are as follows: (1) Purchasing directors and officers liability insurance is conducive to promoting corporate ESG performance. (2) Directors and officers liability insurance is equivalent to introducing professional external supervisors and third-party risk assessors to enterprises. In an environment where the ESG concept is continuously popularized and developed, it encourages enterprises to be more willing to disclose environmental information and improve their own ESG performance. (3) The promoting effect of directors and officers liability insurance on corporate ESG performance is stronger in non-high-tech enterprises and state-owned enterprises.

Based on the research conclusions of this paper, the following suggestions are put forward:

First, promoting the popularization of directors and officers liability insurance is an important means to optimize the incentive mechanism and enhance corporate governance efficiency. Enterprises should recognize the role of D&O insurance in improving corporate ESG performance and incorporate purchasing D&O insurance into their management strategies. By using D&O insurance to adjust managers' risk-averse characteristics, managers can be encouraged to actively assume risks and consider more in decision-making whether the decision can enhance the long-term value of the enterprise. Insurance companies should continuously innovate D&O insurance that integrates with the ESG concept. For example, add ESG performance clauses to insurance contracts, where enterprises with higher ESG ratings can enjoy premium discounts, while those with lower ratings need to pay higher premiums, so as to incentivize enterprises to improve ESG performance. Another example is to include losses caused by executives' mistakes in carbon quota management, non-compliant issuance of green bonds, etc. within the scope of protection.

Second, give full play to the external supervision and risk assessment capabilities of directors and officers liability insurance, improve the quality of corporate environmental information disclosure, and prompt enterprises to enhance ESG performance. Relevant departments should establish a sound ESG information disclosure system, strengthen punishment for false ESG disclosure, increase the cost of corporate violations, and thus improve the information environment in the capital market. Enterprises should comply with environmental information disclosure rules in accordance with relevant laws, regulations, and standards, improve the quality and integrity of information disclosure, and alleviate information asymmetry between internal and external parties. Insurance companies can conduct ESG assessments on companies that purchase D&O insurance, establish a unified assessment framework for different types of industries, and regularly disclose the ESG performance of insured companies externally.

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