Does Directors and Officers Liability Insurance Exacerbate Management Short-Termism?

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Abstract. This paper utilizes data from publicly listed companies spanning the years 2008 to 2022 to examine the influence and underlying mechanisms of Directors and Officers Liability Insurance (D&O insurance) on management short-termism. The analysis reveals that the acquisition of D&O insurance exacerbates the level of short-termism among corporate executives. This result withstands robustness tests employing various fixed effects, additional control variables, and sub-samples. The further mechanism analysis has discovered that the purchasement of D&O insurance exacerbates the management short-termism by alleviating corporate financing limitations, resulting in enormous influence among enterprises in large scales and companies that are not supervised by the big four accounting organizations.The findings of this research contribute valuable considerations for listed companies contemplating the acquisition of D&O insurance, offering meaningful insights for both corporate entities and regulatory authorities.

Keywords: Directors and Officers Liability Insurance, Management Short-Termism, Financing Constraints.

1. Introduction

Directors and Officers Liability Insurance (D&O Insurance) is an insurance product designed to manage risks in corporate governance. It aims to provide protection for company directors and senior executives. Besides, addressing potential legal liabilities and associated expenses incurred in the performance of their duties. The coverage typically encompasses responsibilities related to corporate governance, compliance with company law, financial disclosure, and protection of shareholder rights.

The origins of D&O Insurance can be traced back to 1934 in the United States, coinciding with changes in the legal environment for corporations. Directors and senior executives faced a noticeable increase in legal responsibilities during that period. In order to attract and retain talented corporate leaders and mitigate their legal risks in fulfilling their duties, insurance companies began introducing D&O Insurance products. In the 1980s, D&O Insurance was introduced in civil law countries [1].

The development of D&O Insurance is closely linked to the evolution of corporate governance principles, encouraging corporate management to place greater emphasis on compliance and risk management. As of December 31, 2022, among the 4,860 publicly listed companies selected for this study, 987 had purchased D&O Insurance, accounting for approximately 20.31%. While this rate is comparatively lower than that over 95% seen in developed countries like Europe and the United States, it marks a substantial increase from the initial rate of approximately 3.56% in 2008[2].

The significant rise in the adoption of D&O Insurance is correlated with recent financial scandals involving companies such as Luckin Coffee and Kangmei Pharmaceutical. Luckin Coffee garnered widespread attention in 2020 due to allegations of fabricating sales figures and related financial misconduct. Similarly, Kangmei Pharmaceutical, accused of illegal trading of company stocks and falsifying financial statements, was ordered in 2021 to compensate investors 24.59 billion yuan, with the company's original controlling individuals, directors, senior executives, and the signing auditor held jointly liable [3]. The Kangmei Pharmaceutical case, where five independent directors were held jointly liable for compensation of 3.69 billion yuan, triggered a wave of resignations among independent directors in domestic companies. These incidents underscored vulnerabilities and risks

in corporate governance, leading to a significant increase in the potential legal liabilities faced by corporate management and board members.

The uncertainty of legal liabilities has driven an urgent demand for D&O Insurance. The primary motivation for corporate management's purchase of D&O Insurance is to provide legal liability protection for directors and senior executives, alleviating their financial burdens in the face of potential legal disputes and compensation claims.

Academic perspectives on D&O Insurance can be broadly categorized into two views: support and opposition. Proponents argue that the purchase of D&O Insurance enhances legal protection for management, reduces risk burdens, and increases the likelihood of retaining and attracting high-caliber executives [4]. Additionally, it can alleviate agency problems, effectively saving company costs [5]. The purchase of D&O Insurance signals a commitment to strengthening corporate governance and transparency, fostering investor confidence, potentially lowering capital costs, enhancing market position and promoting long-term corporate development [6]. Moreover, risk-sharing through D&O Insurance encourages bold innovation by executives, promoting investment in high-return projects and improving profit potential [7]. D&O Insurance can also reduce financial restatements [8], mitigate the risk of stock price collapse [9], and enhance corporate social responsibility [10].

Opponents argue that D&O Insurance may introduce moral hazard, as senior executives may relax their oversight of the company when insured, no longer directly bearing the consequences of legal responsibilities. This potential laxity may induce opportunism, negatively impacting corporate governance and development [11]. In addition to the well-discussed negative effects of moral hazard and opportunism, short-termism in management has certain negative implications for corporate governance, long-term development, and investor returns. Short-termism, stemming from agency theory, refers to a phenomenon where organizational management lacks foresight and a long-term perspective in decision-making and planning [12]. This phenomenon arises from managers' excessive focus on short-term performance and immediate returns, neglecting the importance of long-term strategic planning and sustainable development. Short-termism in management may manifest as an overemphasis on short-term financial performance, overlooking in-depth analysis of future market changes, competitive environments and technological trends. It can lead to adverse effects such as hindering long-term investments and corporate innovation [13], increasing audit fees [14], reducing overall productivity [15], and compromising the quality of ESG disclosures [16].

Given these considerations, this study explores whether the purchase of D&O Insurance exacerbates the issue of short-termism in corporate management. Using A-share listed companies from 2008 to 2022 as the research sample, regression analysis of 19,417 data points reveals that the purchase of D&O Insurance indeed intensifies management's short-term behavior. Utilizing various robustness testing methods, such as fixed effects models, interaction fixed effects models, and regression analysis with sub-samples. Mechanism analysis considering financing constraints, as well as heterogeneous analysis on whether it belongs to the four major audits and corporate size, are also employed in the research.

This study contributes to the literature by (1) innovatively investigating the relationship between D&O Insurance and management short-termism, finding that D&O insurance exacerbates management short-termism. Broadening the negative impact of D&O insurance and providing a more comprehensive perspective on its potential consequences in the Chinese market and other emerging markets. (2) In robustness tests, employing various fixed-effects and cross-fixed effects models to control for different industry and provincial influences over years on management decisions, making the experimental results more reliable. (3) Expanding the mechanism research from D&O insurance to management short-termism. Existing literature primarily discusses the negative impact of D&O insurance from the perspective of moral hazard theory, while this study uses contract theory and other theories to interpret the negative effects of D&O insurance, thus expanding the influencing pathways.

2. Research hypothesis

The theory of moral hazard posits that when individuals perceive that their actions will not incur direct negative consequences, their moral risk increases. The acquisition of D&O insurance provides a legal sanctuary for management, fostering the perception that their actions will not directly harm their financial interests [11]. Consequently, moral risk arises, potentially leading to short-termism. With the protection afforded by D&O insurance, management may perceive a diminished sense of urgency regarding their legal responsibilities. This could result in reduced attention to corporate governance and risk management, reinforcing a focus on personal interests [17], as they believe D&O insurance offers protection and mitigates the personal risks, they face due to corporate issues. Moreover, D&O insurance enables management to shift a portion of potential legal liability to the insurance company [18], alleviating personal financial pressures. This risk-sharing may lead to insufficient attention from management towards the long-term interests of the company, as they may be inclined towards short-term gains rather than considering the company's long-term sustainability.

Simultaneously, the purchase of D&O insurance requires the allocation of financial resources by the company, resources that could have been directed towards other strategic investments. If management excessively relies on D&O insurance, it may result in company resources being used to compensate for management's short-termism rather than contributing to the long-term value of the company. Additionally, management may exacerbate overinvestment, increasing the cost of equity financing [19].

Lastly, contracts form the foundation of cooperative relationships [20]. However, in the presence of comprehensive contracts, individuals may lack the means to supervise and constrain their partners. Purchasing D&O insurance establishes a legal contract, but this contract may weaken the company's oversight of management, making it more challenging to hold them accountable for long-term responsibilities. Based on the above research, we posit the following hypothesis.

Hypothesis H1: The purchase of D&O insurance by a company will exacerbate management short-termism.

Firstly, the presence of D&O insurance can help mitigate the legal responsibility risk faced by top-level management within a company. As the decisions and actions of top-level management may face legal challenges, acquiring D&O insurance aids in reducing uncertainty associated with legal disputes [9]. The reduction in legal risk can enhance investor confidence, thereby reducing uncertainty during financing and creating a more favorable financing environment.

Secondly, a company's acquisition of D&O insurance signifies its commitment to safeguarding the legal interests of high-ranking executives. This, in turn, fosters a strengthened trust between the management and the company. Investors are likely to exhibit a greater willingness to invest in the company, given the assurance that the company has taken adequate measures to protect and secure the legal responsibilities of its leadership [21]. The heightened confidence in the management team contributes to the enhancement of the company's creditworthiness, thereby mitigating information asymmetry concerns in the context of financing.

Thirdly, D&O insurance offer a measure of financial security for high-level management, mitigating personal financial strains arising from potential legal liabilities [22]. This engenders increased confidence among top-tier management, fostering a greater willingness to undertake certain risks. The financial prudence exercised by the management has the potential to enhance the company's financing conditions.

The aforementioned rationales suggest that in situations characterized by relatively low financing constraints, companies are more inclined to secure external financing and ensure substantial financial backing [23]. This propensity may give rise to heightened managerial emphasis on the company's short-term performance. Firstly, the financial agility gained through external financing allows companies to promptly acquire the requisite funds to address short-term financial requirements, facilitating managerial implementation of rapid performance improvement measures. Secondly, the expediency of external financing empowers management to swiftly respond to short-term market expectations. Markets often underscore a company's near-term performance, prompting management

to adopt strategies capable of swiftly enhancing shareholder returns and driving stock price escalation to meet investor anticipations. Thirdly, the company's incentive structures frequently align with short-term performance, encompassing instruments like stock options and short-term rewards. In instances of external financing, management is more apt to attain incentive objectives through short-term performance enhancements, thereby garnering increased rewards. Lastly, financing transactions may culminate in a reduction of the company's research and development expenditures, further amplifying managerial myopia [24]. In essence, a diminution of financing constraints may elevate the level of short-termism within management. Building upon the aforementioned analysis, we posit Hypothesis H2.

Hypothesis H2: The purchase of D&O insurance, through the pathway of reducing financing constraints, increases the management short-termism.

3. Research design

3.1. Sample and data source

This study utilizes A-share listed companies from 2008 to 2022 as the initial research sample. D&O insurance initially emerged and rapidly developed in the United States, arriving relatively later in China. Following the issuance of the "Corporate Governance Guidelines for Listed Companies" and the "Notice on Issues Related to the Acceptance of Civil Tort Disputes Caused by False Statements in the Securities Market" by the state in 2002, several major domestic insurance companies successively introduced D&O insurance. In the same year, China's first D&O insurance policy was signed by Vanke and Ping an insurance.

The sample data underwent the following processing steps: Firstly, the exclusion of samples from the financial industry and ST (Special Treatment) companies. Subsequently, the removal of samples with missing values. Finally, to mitigate the potential impact of extreme values on the study, all continuous variables under winsorizing at the 1st and 99th percentiles. After excluding irrelevant and missing values and conducting winsorizing, a total of 19,417 valid data points were obtained.

As matters related to D&O insurance do not fall under the category mandatorily disclosed by the Shanghai and Shenzhen Stock Exchanges, some companies choose to announce such resolutions in their board meeting announcements. The data for this study is sourced from the CSMAR database and Wind database.

3.2. Model setting and variable definition

To verify the hypotheses in this paper, we construct the following research model:

$$Myopia_{i,t} = \alpha_0 + \alpha_1 DO_{i,t} + \sum Control_{i,t} + \sum Year + \sum Indu + \varepsilon \quad (1)$$

The term "Myopia" in this study denotes the short-termism level of the management of different companies in period t. It is referenced from Li's article on "short-term perspective," utilizing a seed word set [25]. The seed word set includes two main categories: direct and indirect. The direct category comprises terms such as "within a day," "within a few months," "within a year," "immediately," "soon," and "right away." The indirect category encompasses terms like "opportunity," "occasion," "pressure," and "challenge." Specific keywords include "dilemma," "pressure," "at the time," "latest," "last," "opportune moment," "several months," "several days," "within a day," "immediately," "eve," "inflation pressure," "severe test," "within a year," "dual pressure," "as soon as possible," "within a day," "forthcoming," "coincide with," "opportunity," "encounter," "coming," "difficulty," "test," "immediately," "at the time," "right at," "immediately," "critical moment," and "right away," based on the frequency of the seed words related to "short-term perspective" in Chinese MD&A.

DO is the core explanatory variable in this study, representing whether a listed company in period t has purchased D&O insurance. If insured, it takes the value 1; otherwise, it takes the value 0. α1 is the regression coefficient, and ε represents the error term.

Controls include the conditions of various control variables in year t, encompassing ownership nature (*SOE*), operating loss (*Loss*), return on assets (*ROA*), revenue growth rate (*Growth*), number of directors (*Board*), enterprise size (*Size*), leverage ratio (*LEV*), top ten shareholder ownership ratio (*Topten*), price-earnings ratio (*PE*), and book-to-market ratio (*MB*). Year and Indu are dummy variables representing the controlled annual and industry effects in this study. Table 1 provides definitions and explanations of the primary variables.

Table 1. Specification of primary variables.

variable	symbol	definition
Directors and Officers Liability Insurance	*DO*	if insured, take 1, otherwise take 0
Management short-termism	*Myopia*	Capture the number of words in the seed word set representing the "short-term perspective" in the annual report of a listed company
ownership nature	*SOE*	0=other,1=state-owned enterprises
operating loss	*Loss*	the net profit at the end of the year is negative, take 1, otherwise take 0
return on assets	*ROA*	Net profit/total asset balance
revenue growth rate	*Growth*	(Operating revenue Amount of the current quarter - operating revenue amount of the previous quarter)/(Operating revenue amount of the previous quarter)
number of directors	*Board*	Number of directors
enterprise size	*Size*	The natural log of total assets
leverage ratio	*LEV*	Liabilities/total assets
top ten shareholder ownership ratio	*Topten*	The sum of the shares held by the top 10 shareholders
price-earnings ratio	*PE*	Current Closing price Current value/(Net profit current annual report value/paid-in capital at the end of the current period)
book-to-market ratio	*MB*	Total assets/market value

4. Empirical analysis

4.1. Descriptive statistics and correlation coefficient analysis

Table 2 presents the results of descriptive statistics. From the table, it is observed that the mean value of *DO* is 0.059, indicating that, within the sampled listed companies in this study, 5.9% have purchased D&O insurance. This suggests a relatively low adoption rate of D&O insurance among Chinese listed companies. The minimum and maximum values of *Myopia* are 0 and 216, respectively. However, notable differences in the degree of future company development and management short-termism exist among different types of listed companies. The other control variables are basically consistent with the existing literature.

Table 2. Descriptive statistics.

Variable	N	Mean	SD	Mean	Min	p50	Max
DO	19,417	0.059	0.235	0.002	0.000	0.000	1.000
Myopia	19,417	28.800	14.480	0.104	0.000	26.000	216.000
SOE	19,417	0.131	0.337	0.002	0.000	0.000	1.000
Loss	19,417	0.033	0.177	0.001	0.000	0.000	1.000
ROA	19,417	0.059	0.040	0.000	0.000	0.053	0.204
Growth	19,417	0.321	0.754	0.005	-0.735	0.142	7.725
Board	19,417	8.208	1.502	0.011	5.000	9.000	15.000
Size	19,417	21.780	1.098	0.008	19.540	21.620	26.160
LEV	19,417	0.334	0.178	0.001	0.050	0.314	0.960
Topten	19,417	64.020	13.750	0.099	22.650	66.240	90.480
PE	19,417	72.570	112.100	0.805	5.065	41.330	942.700
MB	19,417	0.590	0.218	0.002	0.107	0.596	1.174

Table 3 presents the results of the correlation coefficient analysis, with the upper and lower triangles indicating the Spearman correlation coefficient and the Pearson correlation coefficient, respectively. From the table, it is evident that both the Spearman and Pearson correlation coefficients between *DO* and *Myopia* are positive. This preliminary validation supports Hypothesis H1, suggesting that the purchase of D&O insurance indeed exacerbates the short-termism of the management.

Furthermore, all correlation coefficients among explanatory variables are below 0.6, indicating the absence of multicollinearity among the selected explanatory variables. This suggests the effectiveness and representativeness of the chosen variables, enhancing the validity of the variable selection in this study.

Table 3. Correlation coefficient analysis.

	Myopia	*DO*	*SOE*	*Loss*	*ROA*	*Growth*	*Board*	*Size*	*LEV*	*Topten*	*PE*	*MB*
Myopia	1	**0.148**	**0.033**	0.012	**-0.031**	-0.006	-0.018	**0.196**	**0.208**	**0.076**	**-0.076**	**0.137**
DO	**0.161**	1	**0.157**	0.016	**-0.063**	-0.018	**0.052**	**0.189**	**0.104**	-0.001	**-0.037**	**0.039**
SOE	**0.042**	**0.157**	1	-0.005	**-0.088**	**0.043**	**0.211**	**0.232**	**0.149**	**0.094**	**-0.091**	**0.109**
Loss	0.006	0.016	-0.005	1	**-0.180**	**0.024**	**-0.022**	**0.036**	**0.082**	**-0.092**	**0.140**	-0.008
ROA	**-0.029**	**-0.044**	**-0.080**	**-0.150**	1	**-0.080**	**-0.019**	**-0.114**	**-0.373**	**0.239**	**-0.500**	**-0.288**
Growth	0.007	-0.007	**0.059**	**0.045**	**-0.070**	1	**0.023**	**-0.027**	**0.044**	**-0.063**	**0.097**	**-0.046**
Board	0.002	**0.071**	**0.232**	**-0.023**	**-0.024**	**0.022**	1	**0.159**	**0.062**	**-0.019**	**-0.076**	**0.098**
Size	**0.210**	**0.243**	**0.297**	**0.026**	**-0.077**	-0.016	**0.189**	1	**0.512**	**-0.066**	**-0.320**	**0.271**
LEV	**0.178**	**0.112**	**0.165**	**0.085**	**-0.358**	**0.044**	**0.074**	**0.531**	1	**-0.111**	**-0.102**	**0.230**
Topten	**0.086**	-0.004	**0.093**	**-0.095**	**0.216**	**-0.043**	0.002	0.005	**-0.094**	1	**-0.118**	**0.165**
PE	**-0.035**	0.009	**-0.027**	**0.167**	**-0.370**	**0.042**	**-0.051**	**-0.134**	-0.004	**-0.110**	1	**-0.447**
MB	**0.130**	**0.048**	**0.126**	-0.006	**-0.319**	-0.017	**0.110**	**0.310**	**0.254**	**0.149**	**-0.243**	1

Note: Data significant at the 1% level in the table are highlighted in bold.

4.2. Regression analysis

Table 4 reports the empirical results of whether the purchase of D&O insurance influences the short-termism of the management team, using the stepwise regression method. The first column presents the regression of *Myopia* on *DO* with fixed industry and annual effects. The second column builds upon the first column by adding the relevant financial indicators of company characteristics to the regression. The final column incorporates all control variables into the regression. The estimated coefficients for *DO* in the stepwise regression are 2.266, 1.858, and 1.849, respectively, all significantly positive. This suggests that the purchase of D&O insurance exacerbates the short-termism of the management team, validating Hypothesis H1. Among the control variables, *LEV, MB, Size,* and Topten are all significantly and positively related to management short-termism (*Myopia*). These results indicate that D&O insurance may have certain negative effects on corporate governance and management decision-making.

Table 4. Baseline regression result.

	(1) *Myopia*	(2) *Myopia*	(3) *Myopia*
DO	2.266***	1.858***	1.849***
	(3.36)	(2.76)	(2.78)
ROA		0.420	-2.722
		(0.13)	(-0.86)
LEV		4.408***	4.715***
		(4.49)	(4.86)
PE		0.001*	0.001
		(1.74)	(1.52)
MB		4.088***	3.457***
		(6.20)	(5.41)
Size		1.591***	1.568***
		(6.58)	(6.53)
Growth		0.189	0.160
		(1.40)	(1.18)
Board			0.175*
			(1.76)
Topten			0.096***
			(6.38)
SOE			-0.954
			(-1.45)
Loss			0.495
			(1.19)
_cons	19.654***	-17.922***	-25.895***
	(9.86)	(-3.34)	(-4.82)
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
N	19417	19417	19417
R^2	0.198	0.215	0.219

5. Robustness test

5.1. Multiple fixed effects model

This study adopts industry and year as dual fixed effects to investigate the impact of purchasing D&O insurance on management short-termism. To explore additional fixed effects, we introduce individual and annual dual fixed effects, as well as industry, province, and annual triple fixed effects. From the first two columns of Table 5, it can be observed that even with the introduction of these additional fixed effects, the purchase of D&O insurance still exhibits a significantly positive impact on management short-termism.

To enhance the reliability of the results further, this study employs interaction fixed effects. In order to mitigate the potential influence of overall industry changes over time, such as entering a growth phase or a recession, on the results, the third column introduces fixed effects for the year and industry interaction, thereby annually controlling for the impact of changes in each industry on management decision-making and short-sighted behavior. Similarly, in the fourth column, fixed effects for the year and province interaction are introduced to control for the changing impact of each province on company management decisions each year. From the third and fourth columns of Table 5, it can be observed that the coefficients for *DO* are 4.083 and 3.729, respectively, both significantly positive. This indicates that even after incorporating fixed effects with control interaction terms, the purchase of D&O insurance still exhibits a significantly positive relationship with management short-termism, affirming the conclusion of this study that purchasing D&O insurance exacerbates the short-termism of the company's management.

Table 5. Fixed effect test.

	(1) *Myopia*	(2) *Myopia*	(3) *Myopia*	(4) *Myopia*
DO	1.485**	1.800***	4.083***	3.729***
	(2.08)	(2.69)	(10.35)	(9.23)
Controls	Yes	Yes	Yes	Yes
Individual FE	Yes	No	No	No
Industry FE	No	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Province FE	No	Yes	No	No
Year & Industry FE	No	No	Yes	No
Year &Province FE	No	No	No	Yes
N	19417	19417	19398	19115
R^2	0.220	0.219	0.317	0.324

5.2. Add control variables

This study investigates whether the purchase of D&O insurance induces short-termism in the management team, considering that personal characteristics of the board members and executives themselves may also contribute to changes in the dependent variable. Two control variables, *Dual* (indicating whether the Chairman concurrently serves as the General Manager, taking the value 1 if there is a concurrent position, and 0 otherwise) and *Acad* (representing whether members of the executive team have academic experience, taking the value 1 if there is academic experience, and 0 otherwise [26]), are introduced to account for potential variations in the dependent variable.

Upon regression analysis, the coefficient for *DO* in the first column of Table 6 is 2.260, significantly positive. This further corroborates the findings of this study, confirming that the purchase of D&O insurance is associated with an exacerbation of short-termism in the management team.

The data utilized in this study encompassed all publicly listed companies, categorized into four classes based on the transparency classification standards: Class A (excellent), Class B (good), Class C (pass), and Class D (fail). The dependent variable in the research, namely the proxy indicator for management short-termism, was obtained through text analysis. Given the potential for exaggerated and factually inaccurate descriptions in the reporting summaries of publicly listed companies, we conducted robustness tests by selecting companies with higher information transparency.

In Table 6, the second column includes companies rated as Class A and B, while the third column includes companies rated as Class A. The final results align with the conclusions drawn before.

Table 6. Add control variables and Sub-samples.

	(1) *Myopia*	(2) *Myopia* Class A and Class B	(3) *Myopia* Class A
DO	2.260***	1.752**	2.450*
	(2.85)	(2.52)	(1.84)
SOE	-0.817	-1.727**	-2.167***
	(-1.21)	(-2.49)	(-2.66)
Loss	0.432	0.294	-0.158
	(0.97)	(0.71)	(-0.17)
ROA	-4.078	-5.438*	-16.999***
	(-1.21)	(-1.81)	(-2.99)
Growth	0.216	0.194	0.580*
	(1.58)	(1.40)	(1.74)
Board	0.162	0.156	0.176
	(1.58)	(1.50)	(1.01)
Size	1.527***	1.736***	1.582***
	(6.10)	(6.86)	(4.08)

LEV	5.179***	4.148***	1.166
	(5.11)	(4.01)	(0.56)
Topten	0.092***	0.098***	0.126***
	(5.90)	(6.42)	(4.69)
PE	0.001	0.002*	0.005**
	(1.24)	(1.92)	(2.47)
MB	3.515***	3.307***	2.501**
	(5.21)	(4.98)	(2.10)
Dual	0.467*		
	(1.83)		
Acad	0.319		
	(1.24)		
_cons	-25.227***	-28.617***	-21.363***
	(-4.55)	(-5.11)	(-2.60)
Year FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
N	17814	17966	6161
R^2	0.226	0.213	0.186

6. Further analysis

The robustness tests conducted earlier further substantiate the conclusion that the purchase of D&O insurance exacerbates management short-termism. Initially, dual fixed effects for individuals and years, triple fixed effects for industry, province, and year, interaction fixed effects for year and industry, as well as year and province were introduced. Following this, adding two control variables, *Dual* and *Acad* . Finally, the sub-sample was stratified based on company transparency. All three robustness tests corroborated the findings of this study.

In this section, a further analysis is conducted, employing the financing constraint pathway for mechanism analysis and conducting heterogeneity tests based on whether companies belong to the Big Four auditing firms and the size of the enterprise.

6.1. Mechanism analysis

This part further explores the mediating role of financing constraints in the pathway linking the purchase of D&O insurance to management short-termism. The acquisition of D&O insurance may alleviate corporate financing constraints by reducing legal risks and uncertainties, enhancing management trust and relieving the personal financial pressure of top executives. In situations with relatively low financing restrictions, companies are more likely to secure external financing, thereby obtaining ample financial support. This might lead the management team to prioritize short-term corporate performance, as they can easily address short-term financial needs through external financing. Due to the convenience of financing, management may be inclined to adopt short-term measures that boost shareholder returns, meet short-term market expectations, elevate stock prices, and then contribute to management short-termism.

The financing constraint (*SA*) is measured following the methodology of Ju[27], where a higher absolute value of *SA* indicates a greater degree of financing constraints. In the second column of Table 7, with financing constraints as the dependent variable, the coefficient for *DO* is -0.032 and significant at the 1% level, suggesting that the purchase of D&O insurance reduces the extent of financing constraints faced by companies. In the third column of Table 8, when regressing *Myopia* on *SA*, the coefficient for *SA* is -8.365, also significant at the 1% level. This implies that a reduction in financing constraints may increase the degree of management short-termism.

To validate the correctness of this pathway, a bootstrap test is conducted, yielding a 95% confidence interval at the 1% level (0.0379—0.241), excluding 0. Therefore, this pathway is relatively appropriate.

The above findings indicate that the purchase of D&O insurance, through the reduction of financing constraints, further intensifies management short-termism, validating Hypothesis H2.

Table 7. Financing constraint path test.

	(1) *Myopia*	(2) *SA*	(3) *Myopia*
DO	1.848***	-0.032***	
	(2.78)	(-5.51)	
SA			-8.365***
			(-5.32)
SOE	-0.954	0.006	-0.797
	(-1.45)	(1.02)	(-1.22)
Loss	0.501	0.009***	0.589
	(1.20)	(4.41)	(1.42)
ROA	-2.704	-0.046*	-3.108
	(-0.85)	(-1.81)	(-0.98)
Growth	0.159	0.002**	0.167
	(1.17)	(2.03)	(1.25)
Board	0.175*	0.003***	0.212**
	(1.75)	(2.80)	(2.16)
Size	1.568***	0.023***	1.718***
	(6.52)	(4.61)	(7.12)
LEV	4.710***	0.066***	5.314***
	(4.85)	(6.53)	(5.63)
Topten	0.096***	-0.002***	0.081***
	(6.37)	(-9.41)	(5.60)
PE	0.001	-0.000***	0.001
	(1.53)	(-3.33)	(1.33)
MB	3.461***	-0.017***	3.269***
	(5.42)	(-2.58)	(5.16)
_cons	-25.891***	2.921***	-0.625
	(-4.82)	(27.29)	(-0.09)
N	19406	19406	19406
R^2	0.218	0.909	0.223

6.2. Heterogeneity analysis

6.2.1. The Big Four audit firms

The Big Four audit firms (Deloitte, KPMG, Ernst & Young, and PricewaterhouseCoopers) hold a dominant position in the audit industry. Companies audited by these firms are perceived as more trustworthy by investors, and their information disclosure is considered to be of higher quality. To investigate this, the Audit variable is introduced for grouped regression analysis. In the first column of Table 9, under the circumstance of being audited by the Big Four, the p-value for *DO* is 0.957, indicating non-significance. Conversely, in the second column representing non-Big Four audits, the p-value is 0.038, demonstrating significance at the 5% level. This suggests that, in companies audited by the Big Four, there is no clear relationship between management short-termism and the purchase of D&O insurance. This might be attributed to the generally higher audit quality and professional standards maintained by the Big Four, leading to a more transparent and regulated auditing process. Under such circumstances, boards of directors and top management may tend to rely on the effectiveness of the audit process, reducing the need for D&O insurance. Simultaneously, the improvement in audit quality may signify that top management places greater emphasis on long-term value creation, diminishing the likelihood of short-termism. It is also plausible that in the market, audits conducted by the Big Four are often regarded as symbols of reputation and quality. Investors may place more trust in the audit results of the Big Four, lowering concerns about the legal liability risks for companies. This market perception may alleviate the pressure to purchase D&O insurance

and contribute to the formation of a more robust and long-term-oriented corporate management culture.

6.2.2. The enterprise size

Using the median value of enterprise size as a threshold, the sample is divided into two groups. In the third column, representing larger enterprises, the coefficient for *DO* is 1.762 and significant at the 1% level. On the other hand, in the fourth column for smaller enterprises, the p-value for *DO* is 0.352, indicating non-significance. This difference may stem from the fact that larger companies attract more attention from society and investors, bear greater social responsibilities and obligations. So their top management, driven by goals such as stock price appreciation or achieving impressive short-term performance, may be inclined to make decisions favoring short-term development. Consequently, in larger enterprises, the purchase of D&O insurance may exacerbate management short-termism.

Table 8. Heterogeneity analysis.

	(1) *Myopia* Big Four audit	(2) *Myopia* Non-big Four audit	(3) *Myopia* large-scale	(4) *Myopia* small-scale
DO	-0.137	1.413**	1.762**	1.401
	(-0.05)	(2.08)	(2.57)	(0.93)
Controls	Yes	Yes	Yes	Yes
_cons	-38.895*	-19.088***	-28.350***	-14.620*
	(-1.82)	(-3.39)	(-3.34)	(-1.67)
N	851	18555	9708	9709
R^2	0.315	0.215	0.213	0.150

7. Conclusion

Since the introduction of D&O insurance in China, there has been ongoing debate in the academic community regarding its positive and negative effects. This study utilizes data from the CSMAR database covering listed companies from 2008 to 2022. After cleaning and organizing the data, empirical research is conducted to examine the impact and mechanism of D&O insurance purchase on management short-termism. The study ultimately concludes that purchasing D&O insurance exacerbates management short-termism. Further robustness tests, considering different fixed effects and cross-fixed effects such as industry and year, individual and year, and industry, province, and year, all yield significant results.

In the mechanism analysis, it is indicated that the purchase of D&O insurance increases management short-termism by reducing financing constraints. Simultaneously, in the heterogeneity test, companies audited by the Big Four show no significant correlation between D&O insurance purchase and management short-termism, while non-Big four audited companies exhibit a significant positive correlation. Classification based on enterprise size reveals that the correlation is significant for large enterprises but not for small ones.

The empirical analysis in this paper concludes that the purchase of D&O insurance exacerbates management short-termism. This conclusion holds significance both theoretically and practically. (1) The paper extends the study of the negative impact mechanism of D&O insurance, introducing contract theory to explain its adverse effects. The research reveals a positive correlation between management short-termism and the purchase of D&O insurance, enriching empirical and theoretical studies in this domain. (2) The findings of this paper provide guidance for listed companies on whether they should purchase D&O insurance. Many companies currently acquire D&O insurance indiscriminately without considering their own characteristics. According to the research results, to mitigate the issue of management short-termism, opting for audits by the four major audit firms can be an alternative. For small-scale enterprises, the impact of D&O insurance on management short-termism is relatively small, alleviating concerns about its negative effects. (3) Despite the rapid development of Chinese listed companies in recent years, there still exists a certain gap in regulatory

governance compared to the financial markets of developed countries. While the purchase of D&O insurance can mitigate losses for companies and executives to some extent, it also brings about certain negative impacts. Government regulatory authorities should strengthen supervision of the contractual norms of D&O insurance and regulate various financing projects of companies to enhance the positive utility of D&O insurance.

References

[1] Xu Rong, Wang Jie. Research on the Interaction of D&O Insurance and Corporate Governance-Evidence of the Chinese A-share listed Companies [J]. Insurance Studies, 2012 (3): 68-78.

[2] Lai li, Tang Yunxi, Xia Xiaolan, et al. Does Director's and Officers' Liability Insurance Reduce the Corporate Risk? Based on the Perspective of Aggressive Financing Strategy and Credit Access [J]. JOURNAL OF MANAGEMENT WORLD, 2019, 10: 160-171.

[3] Luo Jinhui, Wu Yilong, Wu Ying. Director's and Officers' Liability Insurance and Resignation of Independent Directors: Based on the Shock of Class Action Case of KANGMEI Co.,Ltd. [J].Economic management,2023,45(07):112-134.

[4] Core J E. The directors' and officers' insurance premium: An outside assessment of the quality of corporate governance [J]. Journal of Law, Economics, and Organization, 2000, 16(2): 449-477.

[5] Zheng Zhigang, Xu Rong, Xu Xiangjiang, et al. The Framing of the Clauses of the Company Regulations,the Protection of the Law for the Right of Investors, and the Company Governance: Evidence from China's A-Share Listed Companies[J]. JOURNAL OF MANAGEMENT WORLD, 2011 (7): 141-153.

[6] Wang Jianling, Li Yueting, Wu Xuan. Corporate Social Responsibility as the Signal of Firm Future Performance: Evidence from Chinese Market [J]. Chinese journal of management science, 2018(8):31 ~ 41.

[7] Shi Weizhong. Research on some Legal issues of Director's and Officers' Liability Insurance [J]. Journal of Nanjing Audit Institute, 2004, 1(3): 69 - 73.

[8] Yuan Rongli, Wen Wen, Xie Zhihua. Directors' and Officers' Liability Insurance and Financial Restatements [J]. Accounting research, 2018 (5): 21-27.

[9] Yuan R, Sun J, Cao F. Directors' and officers' liability insurance and stock price crash risk [J]. Journal of Corporate Finance, 2016, 37: 173-192.

[10] Kang Zhaoyu, Jiang Xiandeng, Kuai Yicheng. Does Directors' and officers' liability insurance enhance Corporate Social Responsibility [J]. Finance and accounting monthly, 2023, 44(01):63-72.

[11] Lin C, Officer M S, Wang R, et al. Directors' and officers' liability insurance and loan spreads [J]. Journal of Financial Economics, 2013, 110(1): 37-60.

[12] Berle A A, Means G G C. The Modern Corporation and private property [M]. Transaction publishers, 1991.

[13] Hu Wenbin. Research on Management Myopia and its Impact on Enterprise Innovation [J]. Finance and accounting for international commerce, 2023, (21):43-48+53.

[14] Yang Xiangkun, Lian Yanqing, Duan Lingjun. Does Management's Shortsightedness Increase Audit Fees? -A Perspective Based on Corporate Innovation Investment [J]. Journal of Shanxi Finance and Tax College, 2023, 25(05):33-42.

[15] Zhang Yong, Zhang Chunlei. Research on the Influence of Managerial Myopia on Firm's Total Factor Productivity [J].Guanli Xuebao, 2023, 20(10):1555-1564.

[16] Zhu Rong, Zhao Youye, Sun Man. The Performance Ability of Audit Committee and the Quality of ESG Information Disclosure [J]. Friends of Accounting, 2023, (18):28-37.

[17] Boubakri N, Ghalleb N, Boyer M M. Managerial opportunism in accounting choice: Evidence from directors' and officers' liability insurance purchases [J]. Available at SSRN 1109254, 2008.

[18] Ling Shixian, Bai Ruifeng. Directors' and Officers' Liability Insurance and Firm Performance: An Empirical Test based on the Data of Chinese Listed Companies [J]. Commercial research, 2017(10):78 ~ 86.

[19] Chen Z, Li O Z, Zou H. Directors′ and officers′ liability insurance and the cost of equity[J]. Journal of Accounting and Economics, 2016, 61(1): 100-120.

[20] Yang Ruilong, Nie Huihua. Incomplete Contracting Theory:A Survey[D]. , 2006.

[21] Gupta M, Prakash P. Information embedded in directors' and officers' insurance purchases [J]. The Geneva Papers on Risk and Insurance-Issues and Practice, 2012, 37: 429-451.

[22] Chen Xianfeng, Hu Jun, Hu Guoliu. Directors' & Officers' liability insurance, Cost of Equity Capital and Capacity of Seasoned Equity Offerings [J]. The theory and practice of finance and economics, 2014(1):39 ~ 44+102.

[23] Xu Ruirui, Luo Yan. Research on the Relationship between Financing Constraint, Management Ability and Earnings Management [J]. Investment and cooperation, 2023, (11):130-132.

[24] Tian Lihui, Wang Kedi."Culprit" or "scapegoat"? -- Chinese-style Margin Lending and Management Shortsightedness [J]. Economic review, 2019, (01):106-120.

[25] Li Qianru, Zai Huayun. Does Managerial Myopia Affect the Digital Transformation of Enterprises? [J]. Finance research, 2022, (04):92-104.

[26] Zhou Kaitang, Ma Zhiming, Wu Liansheng. Executive Academic Experience and Corporate Debt Financing Costs [J]. Economic research journal, 2017, 52(7): 169-183.

[27] Ju Xiaosheng, Lu Di, Yu Yihua. Financing Constraints, Working Capital Management and Corporate Innovation Sustainability [J]. Economic research journal, 2013, 48(01):4-16.