

Directors' and Officers' Liability Insurance and Specific Volatility in Corporate Stock Prices

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Abstract. Directors and Officers Liability Insurance (D&O insurance), as a vital tool for corporate risk management and operational stability, exerts a profound influence on the development of share price volatility. This study employs panel fixed-effects models and instrumental variable methods, utilising data from listed companies between 2004 and 2023, to validate the mediating effect of information transparency. Findings reveal that D&O insurance exerts a positive effect on stock price volatility, a conclusion upheld through multiple robustness tests. From an internal corporate governance perspective, this promotional effect is more pronounced in firms characterised by overlapping board and executive functions, high executive compensation incentives, and concentrated share ownership. Regarding external environmental factors, the promotion of stock price volatility by directors' and officers' liability insurance is more pronounced in firms facing high performance pressure, high media attention, and high marketisation. Mechanism analysis indicates that purchasing directors' and officers' liability insurance enhances stock price volatility by improving corporate information disclosure quality and transparency. This conclusion holds significant implications for regulating the development of directors' and officers' liability insurance business and guiding enterprises to enhance information disclosure efficiency.

Keywords: D&O Insurance, Information Transparency, Stock Price Volatility.

1. Introduction

Director and Officer Liability Insurance (hereinafter referred to as “D&O Insurance”) serves as a governance mechanism and is a long-term effective means of mitigating the risk of executive misconduct through insurance coverage. It typically has various microeconomic consequences at the corporate level. As the insurance system continues to undergo deep reforms, it is necessary to further leverage the role of insurance in safeguarding people's livelihoods and serving the real economy, while maintaining strict regulation and risk prevention. The astronomical compensation payments involving Kangmei Pharmaceutical and Luckin Coffee have brought D&O insurance into the spotlight. On July 1, 2024, the newly revised Company Law came into effect, with the new law formally establishing the D&O insurance system through legislative means for the first time. However, as an important tool for transferring the risk of director, supervisor, and senior management liability, D&O insurance may, on the one hand, lead to moral hazard and increase corporate governance costs, while on the other hand, it can promote stable corporate operations and production management. Therefore, against the backdrop of high-quality development in the insurance industry, whether enterprises, as the main body of the real economy, should purchase D&O insurance, and what impact purchasing D&O insurance will have on the specific risks of enterprises, is a topic of significant practical significance and worthy of discussion.

In recent years, directors' and officers' liability insurance products have become increasingly mature and refined, with the question of how this insurance effectively influences enterprises emerging as a hot topic within the industry. Scholars have explored the impact of purchasing directors' and officers' liability insurance on corporate behaviour and information from multiple perspectives: Lai Li et al. (2019) ^[1] found that this insurance encourages management to assume operational risks; whereas Li Conggang et al. (2020) ^[2] discovered that directors' and officers' liability insurance can effectively reduce firms' propensity for non-compliance. Nevertheless, the impact of this insurance at the corporate level warrants further investigation. While most existing research indicates that directors' and officers' liability insurance can effectively reduce corporate non-compliance tendencies,

its effects at the corporate level require deeper exploration. Most existing studies suggest that directors' and officers' liability insurance can effectively reduce corporate non-compliance tendencies. However, its impact at the corporate level still requires in-depth research. Most existing studies indicate that directors' and supervisors' liability insurance can effectively reduce firms' propensity to engage in misconduct. However, this insurance (2020) ^[2] found that it can actually reduce firms' propensity to engage in misconduct. Nevertheless, the impact of directors' and officers' liability insurance at the firm level requires further investigation. Existing literature predominantly analyses this issue from a single behavioural perspective, while relevant research primarily focuses on the economic consequences of this insurance through the analysis of stock price-specific volatility.

The contributions of this paper may include: Firstly, it expands research on the economic consequences of purchasing directors and officers liability insurance (D&O insurance). Existing D&O insurance studies primarily focus on executive misconduct and corporate governance perspectives, examining their impact on operational risks. Building upon this, this paper further investigates whether the information transparency issues arising from purchasing directors and supervisors liability insurance affect stock price volatility, a crucial investment activity. The research supplements the differential impact of D&O insurance on volatility, validates the critical role of internal and external governance tools, and provides new evidence on how financial governance influences pricing efficiency in Chinese markets. Secondly, this paper enriches the literature on the economic consequences of directors' and officers' liability insurance. Moving beyond existing studies' narrow focus on single dimensions such as agency costs or innovation, it reveals the mechanism through which D&O insurance affects stock characteristic volatility from an 'information efficiency' perspective.

2. Research hypothesis

Stock price idiosyncratic volatility refers to the portion of share price fluctuations that cannot be explained by systematic risk, and may be understood as the idiosyncratic information content embedded within share prices. Two explanatory perspectives currently exist regarding the causes of stock price idiosyncratic volatility: the 'information perspective' and the 'non-information perspective' (Roll, 1988) ^[3]. From the information perspective, stock price idiosyncratic volatility is primarily influenced by information. The higher the market information efficiency and transparency, the more fully company-specific information is reflected in share prices, thereby leading to increased idiosyncratic volatility (Hutton, 2009) ^[4]. Wang Yaping (2009) ^[5] confirmed a positive correlation between information transparency and share price synchronism, the latter reflecting the content of idiosyncratic information. Adopting the non-information perspective, Hu (2019) ^[6], Li and Liu (2011)^[7] argue that stock price idiosyncratic volatility cannot be fully explained by informational factors alone, being more significantly influenced by non-informational factors. Existing research on the economic consequences of directors and officers liability insurance primarily focuses on non-informational factors, with few studies examining its impact on stock price idiosyncratic volatility from an informational perspective. This paper specifically investigates whether purchasing directors and officers liability insurance conveys firm-specific information, thereby influencing stock price idiosyncratic volatility.

As an insurance tool, D&O insurance is typically regarded as an alternative to external governance mechanisms and can promote the improvement of corporate supervision and management mechanisms. Ling Shixian and Bai Rui Feng (2017)^[8] argue that D&O insurance can enhance corporate governance transparency by establishing investor trust in the company; Xu Rong et al. (2023)^[9] suggest that insurance underwriting pressure can improve information disclosure quality. By creating a more favourable supervisory environment, D&O insurance enables corporate stock prices to capture more characteristic information, enhance information disclosure quality, and generate an 'information release effect.' Therefore, the following hypothesis is proposed:

H1: Companies that take out directors' and officers' liability insurance will experience increased volatility in their share prices.

3. Empirical Design

3.1. Variable definition

① **Dependent variable:** characteristic volatility of corporate stock prices (*Ivol*). This paper employs a direct measurement approach based on the Fama-French three-factor model to calculate the characteristic volatility of corporate stock prices. The specific calculation method is as follows:

$$\begin{cases} r_{i,t} - r_t = \alpha_i + \beta_{MKT,i}r_{MKT,t} + \beta_{SMB,i}SMB_t + \beta_{HML,i}HML_t + \varepsilon_{i,t} \\ Ivol = \sqrt{N\text{var}(\varepsilon_{i,t})} \end{cases} \quad (1)$$

Among them, $r_{i,t}$ is the daily individual stock return considering cash dividend reinvestment, r_t is the risk-free interest rate, using the daily one-year deposit interest rate; $r_{MKT,t}$ is the market factor; SMB_t is the company size factor, HML_t represents the company growth factor. $\varepsilon_{i,t}$ is the model residual term.

This paper employs monthly characteristic volatility calculated based on daily data, where N denotes the number of normal trading days for company stock i during month t . Ultimately, the mean of the monthly characteristic volatility serves as a proxy variable for the company stock's characteristic volatility for that year.

② **Explanatory variable:** Coverage status of directors' and officers' liability insurance (*Insure*). Following the methodology proposed in existing literature (Yuan et al., 2016; Hu et al., 2019)^[10,11], we employ an instrumental variable approach for measurement. The year in which a firm first discloses directors' and officers' liability insurance coverage is treated as its initial year of insurance coverage. Subsequent announcements that do not explicitly state termination of the insurance are considered to indicate continued coverage. Firms disclosing insurance coverage are coded as 1, otherwise as 0.

③ **Control variables (*Control*):** These include asset size (*Size*), debt-to-equity ratio (*Lev*), return on assets (*Roa*), firm age (*FirmAge*), tangible asset ratio (*Tangible*), ownership structure (*SOE*), dual role (*Dual*), equity concentration (*Top1*), growth potential (*TobinQ*), management shareholding (*Mshare*), and total asset growth rate (*Growth*).

3.2. Model construction

In order to examine whether purchasing D&O insurance suppresses corporate characteristic risk, this paper refers to Li Conggang et al. (2020)^[2] and Lai Li et al. (2019)^[1] and sets up the following regression model:

$$Ivol_{i,t} = \alpha + \beta Insure_{i,t} + \gamma Control_{i,t} + \sum Year + \sum Industry + \varepsilon_{i,t} \quad (2)$$

Here, i and t represent the company and time respectively, *Ivol* is the idiosyncratic volatility of the company's stock price, *Insure* indicates the status of directors' and officers' liability insurance coverage, and *control* is a series of control variables. Additionally, the study controls for time (*Year*) and industry (*Industry*) fixed effects, with standard errors clustered at the firm level.

3.3. Data source

The research subjects are A-share listed companies on the Shanghai Stock Exchange and Shenzhen Stock Exchange. This paper selects relevant data on financial indicators and accounting information of listed companies from the Guotai An database for the period 2004–2023. In accordance with research requirements, the sample data was processed as follows: ① Exclusion of ST stocks, *ST stocks, and financial sector data; ② Exclusion of enterprises with missing data; ③ To avoid

extreme values in the data, the sample variables were trimmed by 1% at the upper and lower ends, resulting in 31,057 observations; ④ If the number of normal trading days in a month was less than 80% of the total trading days in that month, the stock would not be included in the study of characteristic volatility for that month.

3.4. Descriptive statistics

Table 1 reports the descriptive statistics for each variable. The mean for company characteristic risk (*Ivol*) is 0.085, with a minimum of 0.018 and a maximum of 0.249, indicating variation in characteristic volatility across firms. The mean for directors' and officers' liability insurance was 0.089, with a standard deviation of 0.285, indicating significant variation in the implementation of such insurance across firms. Furthermore, all variables passed correlation tests, with no severe multicollinearity issues observed.

Table 1. Descriptive statistics of main statistics

Variable	Sample size	Mean	Standard deviation	Minimum value	Maximum value
<i>Ivol</i>	31,057	0.085	0.027	0.018	0.249
<i>Insure</i>	31,057	0.089	0.285	0.000	1.000
<i>Roa</i>	31,057	0.047	0.066	-0.743	1.285
<i>Size</i>	31,057	22.176	1.289	19.046	28.636
<i>Lev</i>	31,057	0.416	0.193	0.008	0.994
<i>Dual</i>	31,057	0.267	0.442	0.000	1.000
<i>Top1</i>	31,057	0.350	0.150	0.018	0.900
<i>SOE</i>	31,057	0.134	0.195	0.000	0.900
<i>TobinQ</i>	31,057	1.974	1.324	0.625	31.400
<i>FirmAge</i>	31,057	2.829	0.380	0.693	4.174
<i>Mshare</i>	31,057	0.134	0.195	0.000	0.900
<i>Tangible</i>	31,057	0.046	0.059	-0.008	0.852
<i>Growth</i>	31,057	0.155	0.456	-0.929	45.460

4. Results

4.1. Analysis of benchmark regression results

Table 2 reports the benchmark regression results for corporate characteristics and risk under the condition of purchasing directors and officers liability insurance (D&O insurance). Column (1) shows that, without fixed effects, *Ivol* and *Insure* exhibit a significant positive correlation at the 1% significance level. This indicates that when management purchases directors' and officers' liability insurance, higher stock price volatility enhances the validity of research hypothesis H1. In columns (2) to (4), after sequentially incorporating year and industry fixed effects into the model, the *Insure* coefficient remains significantly positively correlated.

From the perspective of corporate internal structure, *Mshare*, *Lev*, and *Dual* are all significantly positive at the 1% level, while *SOE* and *Size* exhibit significant negative correlations; From a corporate operational perspective, *TobinQ* and *Growth* exhibits a significant positive correlation with rates at the 1% significance level. This indicates that the greater a firm's capacity to generate social wealth and its growth potential, the higher the heterogeneous volatility of its share price.

Table 2. Benchmark regression results

	(1)	(2)	(3)	(4)
Variable	<i>Ivol</i>	<i>Ivol</i>	<i>Ivol</i>	<i>Ivol</i>
<i>Insure</i>	0.005***	0.001***	0.004***	0.001***
	(8.725)	(2.976)	(8.488)	(2.771)
<i>Roa</i>	-0.004	0.005	-0.000	0.009**
	(-1.058)	(1.481)	(-0.066)	(2.410)
<i>Size</i>	-0.004***	-0.005***	-0.004***	-0.005***
	(-30.039)	(-34.287)	(-29.973)	(-33.996)
<i>Lev</i>	0.026***	0.024***	0.028***	0.025***
	(26.727)	(26.669)	(27.811)	(27.092)
<i>Dual</i>	0.002***	0.001***	0.002***	0.001***
	(5.453)	(4.028)	(4.946)	(3.707)
<i>Top1</i>	-0.004***	-0.002**	-0.003***	-0.001
	(-3.728)	(-2.243)	(-2.735)	(-0.921)
<i>SOE</i>	-0.004***	-0.003***	-0.004***	-0.003***
	(-11.790)	(-9.329)	(-10.200)	(-8.175)
<i>TobinQ</i>	0.007***	0.005***	0.007***	0.005***
	(30.377)	(25.958)	(29.753)	(25.302)
<i>FirmAge</i>	0.001***	-0.004***	0.002***	-0.003***
	(3.334)	(-9.948)	(4.786)	(-7.922)
<i>Mshare</i>	0.012***	0.011***	0.011***	0.010***
	(14.253)	(13.871)	(12.888)	(12.946)
<i>Tangible</i>	-0.013***	-0.013***	-0.010***	-0.008***
	(-5.994)	(-6.391)	(-4.397)	(-3.713)
<i>Growth</i>	0.005***	0.005***	0.005***	0.005***
	(3.401)	(3.528)	(3.439)	(3.581)
<i>Constant</i>	0.154***	0.163***	0.156***	0.165***
	(49.367)	(51.915)	(46.209)	(49.564)
<i>Observations</i>	31,057	31,057	31,057	31,057
<i>R-squared</i>	0.210	0.393	0.220	0.403
<i>Year FE</i>	NO	YES	NO	YES
<i>Industry FE</i>	NO	NO	YES	YES

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively; values in parentheses are t-values; standard errors are adjusted for company-level clustering, as are all subsequent values.

4.2. Robustness test

① **Replace the explanatory variable:** To ensure the robustness of the results, this paper employs the Fama-French three-factor model, excluding days with insufficient trading volume that accounted for less than 50% of the total annual trading days. Annual residuals are directly utilised as a proxy for idiosyncratic stock price volatility (*Ivol1*). The regression results are presented in Column (1) of Table 3. Furthermore, drawing upon the research of Xiong et al. (2017)^[12], this paper employs the mean of monthly residuals calculated using the Fama-French five-factor model as a proxy for stock-specific volatility. The regression results are presented in column (2) of Table 3. Finally, column (3) of Table 4 employs annual residuals calculated using the Fama-French three-factor model to measure stock price idiosyncratic volatility (*Ivol3*). All regression coefficients are positive, indicating that the greater the extent to which firms incorporate stock price characteristic information through purchasing directors' and officers' liability insurance, the higher their idiosyncratic volatility.

② **Interaction fixed effects:** Since directors' and officers' liability insurance is an imported product, it remains a novel product in the Chinese market. In cities with higher levels of economic development,

directors' and officers' liability insurance will also be prioritised for promotion and development. Therefore, as shown in Table 3, this paper introduces provincial fixed effects in Column (4) and, based on this, introduces industry-year interaction effects and provincial-year interaction effects in Columns (5) and (6), respectively, to mitigate the potential macro-systemic environmental changes caused by regional imbalances in D&O insurance coverage. The regression results are shown in the table below, all of which are positively significant at the 1% level.

Table 3. Robustness test

	(1)	(2)	(3)	(4)	(5)	(6)
Variable	<i>Ivol₁</i>	<i>Ivol₂</i>	<i>Ivol₃</i>	<i>Ivol</i>	<i>Ivol</i>	<i>Ivol</i>
<i>Insure</i>	0.005**	0.001***	0.004**	0.001***	0.001***	0.001***
	(2.401)	(2.689)	(2.253)	(2.921)	(3.337)	(3.165)
<i>Controls</i>	YES	YES	YES	YES	YES	YES
<i>Observations</i>	31,057	31,057	31,057	31,057	31,046	31,053
<i>R-squared</i>	0.379	0.402	0.380	0.406	0.429	0.421
<i>Year FE</i>	YES	YES	YES	YES	YES	YES
<i>Industry FE</i>	YES	YES	YES	YES	YES	YES
<i>Province FE</i>				YES	YES	YES
<i>Industry#Year FE</i>				NO	YES	NO
<i>Province#Year FE</i>				NO	NO	YES

③**Preference score matching:** Given that variations in urban characteristics and public equity features across enterprises may influence the findings of this study, propensity score matching (PSM) was employed to address selection bias under non-random experimental conditions. All control variables were incorporated as covariates in the analysis, with propensity scores calculated based on whether sample enterprises purchased directors' and officers' liability insurance. Column (5) in Table 4 employs a 1:1 nearest neighbour matching method within bootstrapping, column (6) uses kernel matching, and column (7) applies local linear regression matching to eliminate differences in the control group. After re-regression on the matched samples, the association between directors' and supervisors' liability insurance and corporate stock price volatility remained statistically significant at the 1% level, with results passing robustness tests.

4.3. Endogeneity test

When examining the impact of listed companies purchasing directors' and officers' liability insurance on stock price volatility, there may be endogeneity issues. To eliminate endogeneity effects, this paper will use the instrumental variable method (2SLS) for further testing.

This paper selects the average value of D&O insurance purchases by other listed companies in the same province (*ProvinceMean*) as the first instrumental variable (Yuan Rongli, 2021)^[13]. In a province where the insurance industry is more developed, the insurance awareness in that region is stronger, leading to more listed companies purchasing D&O insurance. Companies in such regions are more likely to purchase D&O insurance, but there is no clear evidence that this directly affects the stock price volatility of the company itself. Second, this paper selects the overseas work experience of independent directors (*ForeignExperience*) as the second instrumental variable, defined as the number of independent directors in listed companies with work experience outside mainland China. Given the imported nature of D&O insurance, independent directors with overseas work experience have a deeper understanding of the market mechanisms of D&O insurance and are more aware of the necessity of D&O insurance in mitigating potential litigation risks during the performance of their duties. Therefore, it is expected that the more independent directors with overseas work experience in a company, the more likely the company is to purchase D&O insurance. Additionally, the overseas work experience of directors does not directly affect the stock price volatility of listed companies, thus satisfying the requirements for an instrumental variable.

This study employs a two-stage least squares (2SLS) estimation method, with detailed results presented in Table 4. Columns (1) and (2) display the first-stage regression results, indicating that the regression coefficients for the instrumental variables *ProvinceMean* and *ForeignExperience* are both significantly positively correlated at the 1% significance level. The regression results in Columns (3) and (4) of the second stage indicate that, after controlling for endogeneity issues, directors' and officers' liability insurance remains significantly positively correlated with firm-specific volatility, consistent with prior findings. Furthermore, the Cragg-Donald Wald F-statistic results demonstrate that the instrumental variables selected in this study do not suffer from instrumental variable inefficiency.

Table 4. Results of Endogeneity test and PSM

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Phase I		Phase II				
	<i>Insure</i>		<i>Ivol</i>		<i>Ivol</i>	<i>Ivol</i>	<i>Ivol</i>
<i>ProvinceMean</i>	0.849***						
	(23.22)						
<i>ForeignExperience</i>		0.045***					
		(14.78)					
<i>Insure</i>			0.009***	0.020***	0.002***	0.001***	0.002***
			(2.66)	(3.36)	(3.062)	(2.920)	(2.912)
<i>Controls</i>	YES	YES	YES	YES	YES	YES	YES
<i>Year FE</i>	YES	YES	YES	YES	YES	YES	YES
<i>Industry FE</i>	YES	YES	YES	YES	YES	YES	YES
<i>First-stage F-test (p-value)</i>	0.000	0.000					
<i>N</i>	31,057	31,057	31,057	31,057			
<i>Cragg-Donald Wald F statistic</i>			622.15	171.09			

5. Further analysis

5.1. Heterogeneity analysis

①**Analysis of differences in internal corporate governance:** Based on the foregoing analysis, a significant positive correlation exists between directors' and officers' insurance (D&O insurance) and stock price volatility. As a form of corporate governance mechanism, does the impact of D&O insurance vary according to different corporate governance characteristics? To address this question, this paper conducts grouped tests examining characteristics such as the concurrent holding of general manager and chairman positions, executive compensation incentive mechanisms, and equity concentration levels. This further explores the heterogeneity of internal governance differences and their influence on the relationship between D&O insurance and stock price volatility.

First, when the chairman and general manager are the same person, internal supervision within the company is relatively weak, and managerial opportunistic behaviour in operations cannot be constrained, increasing the probability that managers will harm company interests to satisfy personal interests (Xu Rong et al., 2022) ^[14]. In such cases, purchasing D&O insurance prompts insurance institutions to strengthen supervision of the company, encouraging it to improve information disclosure quality and thereby increase the content of characteristic information in stock prices. Based on this, the present study anticipates that when the chairman and chief executive officer are the same individual, directors' and officers' liability insurance exerts a more pronounced effect on firm-specific volatility. Table 5 reports the regression results. In columns (1) and (2), the study follows the methodology of Zhou Donghua et al. (2022) ^[15], employing an instrumental variable to measure the 'dual identity' structure by indicating whether the chairman and CEO are the same person. The results indicate that the positive correlation between directors' and officers' liability insurance and firm-specific volatility is primarily evident in the dual-role group—when the chairman and CEO are the

same individual, this insurance demonstrates a more pronounced effect in enhancing the informational content of stock price volatility.

Finally, in companies with high equity concentration, severe agency problems exist between major and minor shareholders, making it difficult to achieve internal equity balance (Ren Guangqian et al., 2021) ^[16]. As an effective financial tool, D&O insurance can improve corporate governance systems, and companies with high equity concentration are more inclined to purchase D&O insurance, leading to a significant increase in the incorporation of firm-specific information into stock prices. Based on this, this paper predicts that for companies with high equity concentration, the firm-specific volatility effect of D&O insurance will be more pronounced. In columns (3) to (4), if the top shareholder's equity ratio (*Top1*) exceeds the industry median for the current year, the company is defined as having high equity concentration; otherwise, it is defined as having low equity concentration (Xu Rong et al., 2022) ^[14]. The results indicate that under conditions of high equity concentration, D&O insurance plays a more pronounced role in promoting firm-specific volatility.

Table 5. Based on an analysis of differences in internal corporate governance

	(1)	(2)	(3)	(4)
Variable	Dual roles	No dual roles	High concentration of share ownership	Low concentration of share ownership
<i>Insure</i>	0.003*** (2.753)	0.001 (1.609)	0.002** (2.442)	0.001 (1.340)
<i>Control</i>	YES	YES	YES	YES
<i>Year FE</i>	YES	YES	YES	YES
<i>Industry FE</i>	YES	YES	YES	YES
<i>Constant</i>	0.162*** (21.835)	0.164*** (44.251)	0.174*** (39.649)	0.152*** (29.434)
<i>Observations</i>	8,290	22,767	15,340	15,717
<i>R-squared</i>	0.363	0.411	0.409	0.404

②External Environment Difference Analysis: Furthermore, does the impact of D&O insurance on stock price volatility also change due to changes in the external environment? To address this question, this paper uses indicators such as external performance pressure, media attention, and the degree of marketisation of the company to conduct a heterogeneity test on the sample, and further analyses the impact of differences in the external environment on the relationship between D&O insurance and stock price volatility.

When a company's reported earnings fall short of expectations, managers may face pressure to prioritise short-term performance goals over long-term value. Companies under performance pressure are more likely to purchase D&O insurance (Burgstahler & Dichev, 1997) ^[17]. Based on this, this study expects that when a company faces significant performance pressure, D&O insurance will strengthen its promotional effect on the company's stock price volatility. Table 6 reports the regression results on the impact of external environmental differences on the relationship between D&O insurance and stock price idiosyncratic volatility. In columns (1) to (2), this study draws on the research of Cui Guanghui (2020) ^[18], comparing the company's current year ROA with the average ROA of the previous three years. If the company's current year ROA is lower than its historical performance, it is considered to be under performance pressure; Otherwise, it is not. The results indicate that when a company faces significant performance pressure, it is more willing to purchase D&O insurance, thereby playing a positive supervisory role, leading to an increase in the information content of stock price idiosyncratic volatility.

Furthermore, as important stakeholders and information transmission channels, news media can enhance external supervision of companies that purchase D&O insurance, promote information disclosure, improve corporate transparency, and facilitate more reasonable pricing of the company's stock based on idiosyncratic information. Based on this, this study expects that the higher the media attention, the stronger the external supervisory role on the company, and the more significant the

promotional effect of D&O insurance on the company's characteristic fluctuations. In columns (3) to (4), based on the research by Yuan Rongli et al. (2021)^[13], this study constructs a dummy variable for media attention to group companies. When the number of financial news articles about a company in the current year exceeds the industry average, the media attention is high; otherwise, it is low. The results show that for companies with high media attention, the effect of D&O insurance on idiosyncratic volatility is more pronounced.

Finally, in regions with higher marketisation levels, firms are more inclined to purchase directors' and officers' liability insurance, and their share prices are more susceptible to the influence of idiosyncratic information. Based on this, this paper anticipates that the higher the degree of marketisation, the more pronounced the effect of directors' and supervisors' liability insurance in amplifying idiosyncratic volatility. In columns (5) to (6), this paper adopts the methodology of Li Huiyun et al. (2016)^[19] and Ling Shixian (2022)^[20], classifying Shanghai, Jiangsu, Guangdong, and Zhejiang as regions with higher marketisation, while grouping the remaining provinces as regions with lower marketisation. Subsequent regression analyses grouped the sample according to marketisation levels. Results indicate that directors' and supervisors' liability insurance exerts a more pronounced effect on promoting firm-specific volatility within the higher marketisation group, thereby validating the aforementioned expectation.

Table 6. Based on external environment difference analysis

	(1)	(2)	(3)	(4)	(5)	(6)
Variable	Low performance pressure	High performance pressure	High media attention	Low media attention	High degree of marketisation	Low degree of marketisation
<i>Insure</i>	0.000	0.002***	0.002***	0.001	0.002**	0.001
	(0.208)	(3.018)	(2.674)	(0.894)	(2.468)	(1.244)
<i>Control</i>	YES	YES	YES	YES	YES	YES
<i>Year FE</i>	YES	YES	YES	YES	YES	YES
<i>Industry FE</i>	YES	YES	YES	YES	YES	YES
<i>Constant</i>	0.188***	0.172***	0.196***	0.151***	0.158***	0.173***
	(31.129)	(44.190)	(43.371)	(25.158)	(26.739)	(41.212)
<i>Observations</i>	9,429	21,628	14,745	15,522	14,955	16,102
<i>R-squared</i>	0.444	0.393	0.456	0.380	0.389	0.419

5.2. Mechanism analysis

In the research hypotheses discussed earlier, this paper argues that when stock price idiosyncratic volatility is driven by information factors, purchasing directors and officers liability insurance (D&O insurance) not only serves an external supervisory function but also complements internal governance mechanisms in a positive way, thereby promoting improvements in information disclosure quality and transparency. This, in turn, enhances the idiosyncratic information content of stock prices. In this section, we will attempt to provide further empirical evidence for the mechanism through which D&O insurance influences stock price idiosyncratic volatility.

To test whether purchasing D&O insurance can enhance stock price-specific information content by improving corporate information transparency and disclosure quality. Based on the research by Xu Jingping et al. (2023)^[21], this paper uses the four grades (A, B, C, and D) of information disclosure work assessment results disclosed by the Shanghai and Shenzhen Stock Exchanges (i.e., excellent, good, passing, and failing) as a proxy variable for the transparency of listed companies. The four grades are assigned values from 4 to 1, with higher grades corresponding to higher values and better information disclosure quality. To ensure the robustness of the empirical results, this paper adopts the measurement method proposed by Chen Jun and Xu Hanjun (2019)^[22], using the modified Jones model to estimate the level of earnings manipulation (*DA*). A higher absolute value of *DA* indicates lower information transparency.

The results are presented in Table 7. Column (1) indicates that *Insure* is positively correlated with *RANK* at the 1% significance level, while Column (2) shows that *Insure* exhibits a significant negative correlation with *DA*. This suggests that purchasing Directors and Officers Liability Insurance (D&O insurance) enhances corporate disclosure quality and increases information transparency. When corporate information transparency is high, it indicates a weaker suppression effect on stock price idiosyncratic volatility. Overall, purchasing D&O insurance can encourage companies to further disclose idiosyncratic information, thereby increasing the idiosyncratic information content in stock prices, thereby further validating H1 of this paper.

Table 7. Testing the mediating effect of corporate information transparency

	(1)	(2)
Variable	<i>RANK</i>	<i>DA</i>
<i>Insure</i>	0.046***	-0.004**
	(3.221)	(-2.509)
<i>Controls</i>	<i>YES</i>	<i>YES</i>
<i>Observations</i>	21,888	21,888
<i>R-squared</i>	0.165	0.200
<i>Year FE</i>	<i>YES</i>	<i>YES</i>
<i>Industry FE</i>	<i>YES</i>	<i>YES</i>

6. Conclusion

Against the backdrop of deepening insurance system reforms, the application and regulatory mechanisms for various insurance products continue to evolve, yet their economic impact on the market remains in an exploratory phase. This paper examines the impact of directors' and officers' liability insurance (D&O insurance) purchasing behaviour, corporate transparency, and stock price idiosyncratic volatility on the Chinese market. Against the institutional backdrop of China's drive to build a high-quality modern economic system, and drawing upon comprehensive data from A-share listed companies in Shanghai and Shenzhen, it deepens our understanding of the relationship between directors' and officers' liability insurance and stock price idiosyncratic volatility.

This paper examines the impact of D&O insurance and corporate information transparency on stock price idiosyncratic volatility from multiple angles. The findings reveal: (1) Purchasing D&O insurance can enhance stock price idiosyncratic volatility. As one of the external supervisory mechanisms, D&O insurance plays a more significant role in integrating idiosyncratic information into stock prices in non-state-owned enterprises where the company's wealth creation capacity and growth potential are higher. (2) Under internal governance mechanisms, the promotional effect of D&O insurance on stock price idiosyncratic volatility becomes more pronounced as companies adopt a system where the CEO and chairman positions are combined, offer higher executive compensation incentives, and have higher equity concentration. Under the influence of external environmental mechanisms, as performance pressures intensify, media scrutiny increases, and marketisation advances, directors' and supervisors' liability insurance exerts an increasingly pronounced effect in amplifying stock price volatility. (3) The quality of information disclosure exerts a more direct and widespread impact on stock price fluctuations. For enterprises that have taken out directors' and supervisors' liability insurance, its role in promoting transparency is significant, and its influence on stock price volatility is more pronounced.

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