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# Directors' and officers' liability insurance and minority shareholders' participation in corporate governance

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## Abstract

This study empirically investigates the influence of directors' and officers' liability insurance (D&O insurance) on minority shareholders' participation in corporate governance. Using a sample from Chinese A-share listed companies between 2011 and 2018, we find that D&O insurance can significantly decrease the participation of minority shareholders, and this conclusion remains valid after robustness checks. The mechanism analysis demonstrates that D&O insurance plays a positive role in diminishing minority shareholders' participation through the enhancement of firm performance. Further analyses suggest that the negative association between D&O insurance and minority shareholders' participation is more pronounced in firms with weaker corporate governance practices. These findings provide evidence for the supervisory governance role of D&O insurance, suggesting China should consider encouraging listed companies to purchase D&O insurance for the protection of minority shareholders.

## KEYWORDS

corporate governance, directors' and officers' liability insurance, minority shareholder protection, minority shareholders' activism

## 1 | INTRODUCTION

Safeguarding the interests of minority shareholders has emerged as a matter of paramount importance within the field of global corporate governance (Djankov et al., 2008; Fan & Wong, 2002; La Porta et al., 1998). The literature suggests that safeguarding the interests of minority shareholders not only enhances firm performance and profit potential but also enables the rejection of proposals that could undermine a company's value, thereby improving corporate governance quality (Berkman et al., 2010; La Porta et al., 2002). Compared with institutional investors, minority shareholders have a limited voice in corporate governance. Their limitations in acquiring information and professional expertise constrain their ability to exert influence over corporate entities (Bharath et al., 2013; La

Porta et al., 2002). Due to information asymmetry, substantial agency conflicts exist between controlling and minority shareholders (Shleifer & Vishny, 1997) and between managers and minority shareholders, especially in emerging markets with high corporate ownership concentration and deficient legal systems (Wang & Qiu, 2023).

The theory of corporate governance mainly focuses on protecting minority shareholders' interests through the mitigating of conflicts of interest (Guillén & Capron, 2016; La Porta et al., 1998). Regulatory authorities worldwide are dedicated to promoting direct participation by minority shareholders in corporate decision-making processes (Cao et al., 2022; Gao et al., 2020). However, the effectiveness of traditional investor protection measures, such as board independence, in mitigating agency issues

among insiders often faces hindrance due to insufficient legal enforcement (Defond & Hung, 2004). Currently, black swan events persist in the capital market. For instance, the financial fraud perpetrated by Luckin Coffee led to significant financial losses for investors. Most black swan events originate mainly due to the lack of effective internal controls and incentive mechanisms, resulting in negligence by directors and officers, thereby compromising the interests of minority shareholders (Jian & Wong, 2010; Jiang et al., 2010; Liu & Lu, 2007). Given this context, it is imperative to investigate methods for enhancing the market supervision mechanism, establishing a transparent and efficient capital market, and strengthening the legal protection (Chen et al., 2013).

We have identified a factor that could potentially impact investor protection mechanisms, namely, directors and officers liability insurance (D&O insurance). D&O insurance is a form of liability insurance where the insurer assumes responsibility for compensating listed companies in the event of lawsuits or losses incurred by directors and executives due to negligence in their daily operations. However, there are differing viewpoints regarding the impact of D&O insurance. According to some scholars, D&O insurance can effectively oversee and regulate directors and executives, resulting in reduced corporate agency costs, improved corporate governance, risk mitigation, and increased corporate value (Core, 2000; O'Sullivan, 1997). Conversely, another scholar argued that the underwriting impact of D&O insurance might incentivise opportunistic behaviour and moral hazard.

Prior research has primarily examined the economic implications of D&O insurance from the standpoint of policyholders (listed companies) and the insured individuals (directors and executives). However, there is an obvious void in the current literature. Specifically, researchers have paid limited attention to the effects of D&O insurance on third-party individuals, particularly minority shareholders involved in director liability tort incidents. As the largest emerging market, the cumulative count of individual investors in China's capital market had surpassed 198 million, with over 95% of these investors holding shares valued at less than RMB 500,000 in January 2022 (Wang & Qiu, 2023; Xu et al., 2022). Minority shareholders, unlike institutional investors or hedge funds, face significant disadvantages in terms of information access and legal recourse. Nevertheless, their impact on the market should not be underestimated. Therefore, it becomes imperative to study the potential influence of D&O insurance. Consequently, our study adopts minority shareholders' participation as a novel research perspective to explore the economic implications of D&O insurance.

This study investigates the association between D&O insurance and minority shareholders' participation using a sample of Shanghai and Shenzhen A-share listed companies spanning from 2011 to 2018. The findings indicate that D&O insurance negatively associated with minority shareholders' participation in the annual general meeting (AGMs).<sup>1</sup> The conclusion remains valid after conducting robustness checks, including alternative dependent variables, IV approach, PSM procedure, and mitigating reverse causality.

Subsequently, we investigate the mechanisms by which D&O insurance impacts minority shareholders' participation. We utilise the 2SLS approach (Shaver, 2005) to assess the potential mediating role of firm performance. The findings suggest that D&O insurance may diminish minority shareholders' participation by enhancing firm performance. Next, we explore the effects of the online voting policy implemented in 2014 and found that the negative correlation between D&O insurance and the participation of minority shareholders became more pronounced after 2014.

Furthermore, we examine the effects of varying levels of corporate governance on the association between D&O insurance and minority shareholders' participation. The findings reveal that the impact of D&O insurance on minority shareholders' participation is more pronounced in firms characterised by higher litigation risk, poorer internal control quality, or inferior information disclosure. These findings imply that D&O insurance primarily diminishes minority shareholders' participation in corporate governance through its supervisory governance effect.

This paper makes research contributions in three aspects. Firstly, this paper examines the impact of D&O insurance on minority shareholders. Specifically, our study fills a research void in the D&O insurance literature and contributes to the existing body of research on the economic implications of D&O insurance.

Secondly, there has been controversy in current literature regarding the effect of D&O insurance. This paper provides evidence that D&O insurance serves as a supervisory governance mechanism from the perspective of minority shareholders. This finding enhances and advances research on the relationship between D&O insurance and corporate governance, while also contributing to the understanding of the factors driving minority shareholders' participation.

Thirdly, the development of liability insurance in China is still at an early stage. Limited research has been conducted on the effects of implementing liability insurance on third parties. This paper can offer valuable insights and support for research on liability insurance.

The subsequent sections of this paper are organised as follows: Section 2 presents the literature review and research hypotheses. Section 3 outlines the research design. The results and empirical analysis presented in Sections 4 and 5. Section 6 presents the research conclusions and policy recommendations.

## 2 | LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

### 2.1 | Literature review

Despite the development of D&O insurance spanning over 80 years, there remains a controversy among academics regarding its impact on corporate governance. One perspective argues that D&O insurance has a positive impact. On one hand, when listed companies acquire D&O insurance, it transforms insurance companies into the role of third-party overseers. O'Sullivan (1997) conducted an empirical study based on Holderness (1990) research and found that D&O insurance serves a supervisory function. When issuing a D&O insurance contract, insurance companies assume the responsibility of supervising directors and executives. Core (1997) discovered a significant enhancement in the quality of corporate governance resulting from the purchase of D&O insurance. Xu and Wang (2012) demonstrated a substantial reduction in corporate agency costs through the implementation of D&O insurance as an independent governance mechanism. On the other hand, D&O insurance mitigates the performance risk encountered by directors and executives. D&O insurance empowers decision-makers to operate with confidence and boldness, thereby enhancing corporate efficiency, attracting top-tier external managers, and fostering internal supervision (Lin et al., 2022). Jensen and Meckling (2019) argued that in the absence of D&O insurance safeguarding managers' interests, they are more likely to make conservative decisions and select projects with low risk and low return due to risk aversion, which hinders the company's long-term growth. Jia and Liang (2013) contend that D&O insurance enables directors and executives to prioritise long-term interests. Furthermore, Priest (1986) argued that D&O insurance establishes a secure decision-making environment for managers. Consequently, D&O insurance facilitates the retention and attraction of skilled managers, thereby enhancing internal corporate governance.

Conversely, an opposing viewpoint posits that D&O insurance may have adverse implications. D&O insurance affords protection to directors and executives, mitigating the financial consequences of their misconduct,

which in turn, may incentivise moral hazard and encourage opportunistic conduct. According to Zou et al. (2008), D&O insurance is significantly and positively associated with conflicts between controlling and minority shareholders. Furthermore, companies primarily purchase D&O insurance to protect directors and executives from lawsuits initiated by minority shareholders. Boyer and Tennyson (2015) discovered that insured companies tend to engage in increased earnings management. Lai et al. (2019) argued that firms with D&O insurance are more likely to engage in short-term loans, thereby increasing operating risk. Therefore, D&O insurance can foster moral hazard and incentivise opportunistic behaviour.

Regarding the literature on the factors driving minority shareholders' participation, Maug and Yilmaz (2002) and Rubin and Rubin (2010) highlighted the convenience offered by the online voting mechanism as a facilitator for their engagement in corporate governance. The availability of online voting can significantly boost the participation enthusiasm of minority shareholders in AGMs. Listokin (2010) found that minority shareholders in countries with weaker legal environments are less likely to exercise their rights. From corporate governance perspective, Kong et al. (2013) investigated the impact of minority shareholders' participation, which revealed a negative correlation between minority shareholder voting and the quality of corporate governance. According to Li and Kong (2013), insufficient financial information transparency prompts minority shareholders to actively engage in corporate governance to safeguard their rights and interests. Additionally, the ownership structure of the company also influences the enthusiasm of minority shareholder participation. In cases where conflicts between controlling and minority shareholders are significant, minority shareholders demonstrate proactive engagement in corporate governance (Li et al., 2012).

In conclusion, there is a widely held belief that the participation enthusiasm of minority shareholders is influenced by the quality of corporate governance. Nevertheless, there remains ongoing debate surrounding the economic implications of D&O insurance.

### 2.2 | D&O insurance and minority shareholders' participation

Given the distinctive capital market structure in China, listed companies are characterised by highly concentrated ownership, often dominated by controlling shareholders (Chen et al., 2011; Yuan et al., 2016). In addition, state-owned enterprises encounter the challenge of absentee owners, leading to dual agency problems for

minority shareholders in China (Li et al., 2004). In response to dual agency problems, minority shareholders often employ 'voice voting' or 'free riding' strategies (Kong, 2019). With improved corporate governance, the marginal benefit of engaging in corporate governance diminishes. Consequently, rational minority shareholders often exhibit a preference for 'free-riding', which leads to a decrease in their enthusiasm for participating in AGMs (Cao et al., 2022; Kong et al., 2013). In cases of inadequate corporate governance, minority shareholders may choose to participate in AGMs to oversee managers' conduct and protect their interests (Cao et al., 2022; Jia, 2015; Kong et al., 2013). Given the assumption that minority shareholders are rational actors, they are likely to employ diverse strategies to safeguard their rights and interests in different corporate governance contexts.

Firstly, D&O insurance has a positive impact on minority shareholders. On the one hand, insurance companies assist minority shareholders in monitoring the company's governance. D&O insurance introduces insurance companies as external supervisors, thereby complementing the existing shareholder monitoring mechanism (Core, 2000; Holderness, 1990). While policy issuance generates revenue for insurance companies, D&O insurance also exposes them to the risk of assuming compensation liability in the event of losses incurred by the listed companies. Consequently, insurance companies are required to act prudently in D&O insurance contracts and conduct due diligence on insured companies prior to underwriting. Subsequently, insurance companies maintain supervision over the operations of the insured company after underwriting. Insurance companies offer prompt feedback in case of policyholder misconduct, such as raising premium rates or negotiating riders that heighten the opportunity cost for the insured company (Boyer & Stern, 2014; Core, 2000). Additionally, insured companies may incur audit risk, incentivising audit firms to raise their audit fees, and companies with strong governance practices may proactively seek high-quality audit services (Chung & Wynn, 2014). Insurance companies and audit firms assume the role of overseeing the insured companies, enhancing the company's information transparency, curbing earnings management, and ultimately diminishing the direct supervision required from minority shareholders. On the other hand, D&O insurance covers the risk of litigation resulting from directors' and officers' negligence, thereby empowering decision-makers to conduct confidently and boldly. D&O insurance provides a relatively secure tenure environment for directors and executives, which serves as a magnet for attracting and retaining competent individuals in these roles (Priest, 1986). This environment mitigates the

short-sighted incentives, strengthens internal corporate governance (Lin et al., 2022), and ultimately enhances corporate performance. Consequently, the decisions made by directors and executives instill a sense of confidence and reassurance among minority shareholders, leading to a diminishment of participation by minority shareholders.

Secondly, D&O insurance mitigates the risk of litigation resulting from misconduct by directors and executives. D&O insurance diminishes the deterrent impact of the law, potentially inducing moral hazard among management, triggering opportunistic behaviour, and giving rise to dual agency problems. Upon procuring D&O insurance, officers may amplify their discretionary expenditures, engage in less effective acquisitions, and pursue riskier investments, thereby augmenting the operational risk of the company (Boyer & Tennyson, 2015; Lai et al., 2019; Lin et al., 2011). Moreover, directors, particularly controlling shareholders, exhibit a greater propensity to infringe upon the interests of minority shareholders. Controlling shareholders embezzle company assets through related party transactions or mergers and acquisitions, resulting in a decline in the company's operational efficiency (Fried et al., 2020; Jiang et al., 2010). In situations where D&O insurance adversely affects the company, rational minority shareholders safeguard their rights by voting actively. Consequently, minority shareholders actively engage in corporate decision-making and curb opportunistic behaviour by management. Building on the aforementioned analysis, we put forward the following competing hypotheses.

**H1a.** The purchase of D&O insurance exerts a supervisory governance effect in reducing the participation of minority shareholders in corporate governance.

**H1b.** The purchase of D&O insurance gives rise to opportunistic effects, which subsequently increases the participation of minority shareholders in corporate governance.

### 3 | SAMPLE CONSTRUCTION AND RESEARCH DESIGN

#### 3.1 | Sample construction

We obtained the study sample from the China Stock Market and Accounting Research (CSMAR) database, consisting of annual data of listed companies in Shanghai



and Shenzhen A-shares from 2011 to 2018. We conducted a preliminary screening of the study sample using the following steps. Firstly, we excluded \*ST and \*PT<sup>2</sup> listed companies. Secondly, we excluded financial and insurance companies due to their distinctive business models that differ from those of other industries. Thirdly, we excluded companies with missing relevant financial data. Finally, to mitigate the impact of extreme values on the findings, we subjected the continuous variables to a two-sided 1% quantile tailing process. After processing, we obtained a total of 17,480 annual observations from 3131 companies.

### 3.2 | Measure of minority shareholders participation

According to CSRC, minority shareholders are defined as shareholders, other than directors and executives, who individually or collectively hold less than 5% of the total shares (Feng et al., 2021; Gao et al., 2020; Yao et al., 2023). Due to the absence of mandatory disclosure by companies regarding the voting of minority shareholders, we employ an alternative indirect measure to capture their participation. More specifically, as illustrated in Equation (1), minority shareholders' participation (Msp) is calculated as the difference between the number of shares attending the AGMs and the number of shares held by shareholders with ownership exceeding 5%, divided by the total shares of the listed company in the third quarter (Gao et al., 2020; Wang, 2020; Yao et al., 2023).

$$\text{Msp} = \frac{\text{Number of shares attending the AGMs} - \text{Number of shares held by shareholders over 5\%}}{\text{Total number of shares in the third quarter}} \quad (1)$$

### 3.3 | Measure of D&O insurance

In China, while listed companies are not obligated to disclose detailed information regarding the purchase of D&O insurance. Based on this, we measure D&O insurance in two dimensions. Firstly, drawing on Zou et al. (2008), we define D&O insurance as a dummy variable that equals 1 if the firm purchases D&O insurance and 0 otherwise. Secondly, within our main regression, we account for the temporal aspect of D&O insurance (Doi\_Buytime). If the company consistently purchases it for  $n$  years, the value of Doi\_Buytime is set to  $n$ .

### 3.4 | Research design

The primary objective of our research is to investigate the impact of D&O insurance on the engagement of minority shareholders in AGMs. Building upon the studies conducted by Yao et al. (2023) and Kong et al. (2013) regarding minority shareholders' voting behaviour, we formulate Equation (2) to examine the impact of D&O insurance on minority shareholders' participation in corporate governance during AGMs.

$$\text{Msp}_{i,t} = \beta_0 + \beta_1 \text{Doi}_{i,t} / \text{Doi\_Buytime}_{i,t} + \sum_{k=2}^m \beta_k \text{Controls}_{k,i,t} + \varepsilon_{i,t} \quad (2)$$

In the model, Msp represents minority shareholders' participation. Doi and Doi\_Buytime signify the dummy variable for D&O insurance and the duration of D&O insurance, respectively. To account for potential confounding factors, we incorporate a comprehensive set of control variables established in prior research (Kong et al., 2013; Yao et al., 2023). These variables encompass a firm's asset size (Size), return on assets (Roa), financial leverage (Lev), fixed assets (Fa), board independence (Indep), presence of Big Four International Audit Firms (Big4), CEO duality (Dual), largest shareholder's holding (Top1), holdings of the top 2 to top 10 shareholders (Top2\_10), management shareholdings (Msh), institutional shareholdings (Inshare), cash dividend (Ddr), growth rate (Growth), and firm age (Firmage). Furthermore, we incorporate controls for the year effect and industry effect to mitigate their potential influence. To

mitigate the potential impact of cross-sectional and time-series correlation on the findings, we employ cluster standard errors at the firm and year levels. The specific definitions of the variables are shown in Table A1.

## 4 | EMPIRICAL RESULTS

### 4.1 | Summary statistics

Table 1 provides summary statistics based on 17,480 observations spanning from 2011 to 2018. The sample

TABLE 1 Summary statistics.

Variable	Full sample				Insured			Uninsured			T-test
	N	Mean	Median	SD	N	Mean	Median	N	Mean	Median	T-value
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
<i>Msp</i>	17.480	0.03	0.01	0.05	1084	0.03	0	16.396	0.04	0.01	4.59***
<i>Doi</i>	17.480	0.06	0	0.24	1084	1	1	16.396	0	0	-
<i>Doi_Buytime</i>	17.480	0.43	0	1.95	1084	6.86	7	16.396	0	0	-211.89***
<i>Size</i>	17.480	22.2	22.02	1.28	1084	23.42	23.35	16.396	22.12	21.97	-33.32***
<i>Roa</i>	17.480	0.05	0.05	0.06	1084	0.05	0.05	16.396	0.05	0.05	2.86***
<i>Lev</i>	17.480	0.43	0.42	0.21	1084	0.54	0.56	16.396	0.42	0.41	-18.38***
<i>Fa</i>	17.480	0.22	0.19	0.16	1084	0.25	0.20	16.396	0.22	0.19	-6.60***
<i>Indep</i>	17.480	0.37	0.33	0.05	1084	0.38	0.36	16.396	0.37	0.33	-3.08***
<i>Big4</i>	17.480	0.06	0	0.24	1084	0.32	0	16.396	0.04	0	-39.06***
<i>Dual</i>	17.480	0.25	0	0.44	1084	0.12	0	16.396	0.26	0	10.81***
<i>Top1</i>	17.480	35.18	33.36	14.97	1084	37.67	36.02	16.396	35.02	33.20	-5.67***
<i>Top2_10</i>	17.480	23.14	21.97	13.03	1084	24.52	23.50	16.396	23.05	21.90	-3.60***
<i>Msh</i>	17.480	0.10	0	0.17	1084	0.02	0	16.396	0.10	0	16.86***
<i>Inshare</i>	17.480	44.77	47.27	24.48	1084	60.86	63.94	16.396	43.70	46.14	-22.68***
<i>Ddr</i>	17.480	0.27	0.21	0.31	1084	0.25	0.21	16.396	0.27	0.21	2.29**
<i>Growth</i>	17.480	0.18	0.11	0.41	1084	0.15	0.08	16.396	0.19	0.12	2.54**
<i>Firmage</i>	17.480	2.78	2.83	0.37	1084	2.94	3	16.396	2.77	2.83	-13.93***

Note: This table presents the results of the summary statistics. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Definitions of all variables are provided in the Table A1.

exhibits a mean value of 0.06 for D&O insurance, suggesting a low level of D&O insurance coverage among Chinese listed companies. The mean value and variance of minority shareholders' participation are 0.03 and 0.05, respectively, indicating a lack of enthusiasm in corporate governance among minority shareholders. The study sample is divided into two groups based on whether D&O insurance is purchased or not. The mean value of *Msp* for insured companies is 0.03, which is lower than the 0.04 for uninsured companies. The difference is statistically significant at the 1% level. These summary statistics provide initial evidence for H1a, suggesting a negative relationship between D&O insurance and minority shareholders' participation. Furthermore, the insured companies exhibit significantly larger firm asset size, financial leverage, fixed assets, board independence, largest shareholder holding, top 2 to top 10 shareholder holdings, institutional shareholdings, and firm age compared to the uninsured companies. However, the insured companies have significantly lower manager shareholdings, cash dividend, and growth rate compared to uninsured companies.

## 4.2 | Baseline regression results

Table 2 presents the baseline regression results examining the relationship between D&O insurance and minority shareholders' participation. Columns 1–2 report the regression results controlling for year and industry effects only. The results reveal significant negative associations between both 'Doi' and 'Doi\_Buytime' and minority shareholders' participation, with significance levels of 1% and 5%, respectively. After controlling for all variables, the regression results are shown in Table 2, in columns 3–4. Specifically, the coefficient for 'Doi' is -0.0057, which is statistically significant at the 1% level, and the coefficient for 'Doi\_Buytime' is -0.0006, significant at the 5% level. These findings support H1a, suggesting that the purchase of D&O insurance by listed companies significantly diminishes the incentive for minority shareholders to engage in corporate governance. All regressions were clustered standard errors at the firm and year levels. This result is in line with the notion that due to monitoring from D&O insurance companies, minority shareholders are less likely to attend AGMs.

**TABLE 2** D&O insurance and minority shareholders' participation: baseline regression.

	Msp (1)	Msp (2)	Msp (3)	Msp (4)
<i>Doi</i>	−0.0065*** (−2.82)		−0.0057*** (−2.63)	
<i>Doi_Buytime</i>		−0.0007*** (−2.70)		−0.0006** (−2.46)
<i>Size</i>			0.0022*** (2.62)	0.0021*** (2.58)
<i>Roa</i>			0.0455*** (3.67)	0.0457*** (3.66)
<i>Lev</i>			−0.0005 (−0.10)	−0.0004 (−0.09)
<i>Fa</i>			−0.0027 (−0.54)	−0.0027 (−0.54)
<i>Indep</i>			−0.0519*** (−4.79)	−0.0519*** (−4.81)
<i>Big4</i>			0.0043 (1.35)	0.0038 (1.19)
<i>Dual</i>			0.0006 (0.54)	0.0006 (0.55)
<i>Top1</i>			−0.0009*** (−9.60)	−0.0009*** (−9.59)
<i>Top2_10</i>			−0.0004*** (−3.60)	−0.0004*** (−3.65)
<i>Msh</i>			0.0405*** (4.31)	0.0406*** (4.32)
<i>Inshare</i>			0.0002* (1.94)	0.0002* (1.93)
<i>Ddr</i>			0.0022 (1.20)	0.0022 (1.20)
<i>Growth</i>			−0.0033*** (−3.62)	−0.0032*** (−3.56)
<i>Firmage</i>			−0.0105*** (−4.17)	−0.0106*** (−4.15)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Constant	0.0218*** (4.69)	0.0218*** (4.70)	0.0481*** (3.06)	0.0495*** (3.15)
Observations	17,480	17,480	17,480	17,480
Adjusted $R^2$	0.0124	0.0122	0.0505	0.0503

*Note:* This table presents the regression results of the baseline regression. The dependent variable, denoted as Msp, represents the percentage of minority shareholders attending the annual general meeting. *Doi* is a dummy variable that equals 1 if the firm purchases D&O insurance and 0 otherwise. *Doi\_Buytime* represents the duration of D&O insurance. Columns 1–2 display the regression results controlling for year and industry effects only. Columns 3–4 represent the regression results controlling for all control variables. The *t*-statistics, reported in parentheses, are based on robust standard errors clustered at both the firm and year levels. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Definitions of all variables are provided in the Table A1.

**TABLE 3** Alternative measure of dependence variables.

	Msp_r (1)	AMsp (2)	Msp_N (3)
<i>Doi</i>	−0.0061** (−2.32)	−0.0219* (−1.89)	−0.0071** (−1.99)
<i>Size</i>	0.0027*** (2.70)	0.0709*** (25.79)	−0.0039*** (−2.93)
<i>Roa</i>	0.0512*** (3.97)	−0.0105 (−0.28)	0.1903*** (11.15)
<i>Lev</i>	−0.0011 (−0.20)	−0.0627*** (−4.05)	−0.0093* (−1.70)
<i>Fa</i>	−0.0019 (−0.34)	0.0571*** (3.14)	−0.0122* (−1.71)
<i>Indep</i>	−0.0648*** (−4.92)	0.0538 (1.37)	−0.0196 (−1.12)
<i>Big4</i>	0.0052 (1.39)	0.0094 (0.60)	0.0141*** (2.57)
<i>Dual</i>	0.0007 (0.53)	−0.0024 (−0.50)	0.0002 (0.10)
<i>Top1</i>	−0.0011*** (−10.51)	0.0048*** (13.26)	−0.0010*** (−5.59)
<i>Top2_10</i>	−0.0005*** (−3.92)	0.0039*** (10.93)	−0.0005*** (−2.59)
<i>Msh</i>	0.0561*** (5.27)	−0.0666** (−2.33)	0.1736*** (7.02)
<i>Inshare</i>	0.0002** (2.36)	−0.0003 (−1.22)	0.0009*** (6.79)
<i>Ddr</i>	0.0034 (1.55)	−0.0090* (−1.76)	0.0001 (0.04)
<i>Growth</i>	−0.0034*** (−3.43)	−0.0157*** (−7.78)	−0.0012 (−0.58)
<i>Firmage</i>	−0.0136*** (−4.47)	0.0138* (1.83)	−0.0021 (−0.56)
Year FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Constant	0.0579*** (3.18)	−1.6535*** (−25.82)	0.1213*** (4.09)
Observations	17,480	17,480	17,480
Adjusted $R^2$	0.0513	0.3477	0.0730

*Note:* This table presents the regression results using alternative explanatory variables. Msp\_r is defined as the ratio of Msp divided by (1-Msp). AMsp accounts for the average participation rate, considering both annual general meetings and special shareholders' meeting. The number of minority shareholders (Msp\_N) is calculated as the difference between the number of shareholders attending the AGMs and the number of shareholders with a shareholding ratio of more than 5%, divided by the total number of shareholders. The *t*-statistics, reported in parentheses, are based on robust standard errors clustered at both firm and year levels. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Definitions of all variables are provided in the Table A1.

### 4.3 | Robustness check

#### 4.3.1 | Alternative measure of dependence variable

To account for the potential measurement error in minority shareholders' participation, we employ alternative dependent variables to mitigate this issue. Firstly, we introduce an indicator (*Msp\_r*) to mitigate the influence of non-attending shareholders on minority shareholders' participation (Wang, 2020). Mathematically, *Msp\_r* is defined as *Msp* divided by (1-*Msp*). Secondly, in China, listed companies conduct multiple special shareholders' meetings in addition to the AGMs. Solely considering the participation of minority shareholders in the AGM may lead to potential biases. Therefore, we calculated the *Msp* in all shareholder meetings following Equation (1) and subsequently determined the average (*AMsp*) based on the number of shareholder meetings held during the respective year. Thirdly, Huang et al. (2022) argued that relying solely on the shareholding ratio to gauge minority shareholders' participation may overlook the influence of the number of minority shareholders, resulting in potential metric bias. Building on prior research (Huang et al., 2022; Wang & Qiu, 2023), we utilise the number of minority shareholders (*Msp\_N*) as an alternative dependent variable (Equation (3)). According to the Securities Investment Fund Law, when a fund manager purchases shares of a publicly listed company using the funds they oversee, they are legally designated as direct shareholders of that company. The count of institutional investors and mutual funds is considerably smaller in comparison to the number of minority shareholders. Consequently, the application of this methodology helps alleviate the influence of mutual funds and institutional investors on our regression analysis. As presented in Table 3, H1a is supported by the negative and significant coefficients of D&O in regressions involving *Msp\_r*, *AMsp*, and *Msp\_N*.

$$Msp\_N = \frac{(\text{Number of shareholders attending the AGM} - \text{Number of shareholders with a shareholding ratio of more than 5\%}) * 100}{\text{Total number of shareholders}} \quad (3)$$

#### 4.3.2 | Instrumental variable approach

Subsequently, we employ the instrumental variables approach to address potential endogeneity concerns. More specifically, we utilise provincial insurance depth (*Indepth*) and the average D&O insurance coverage of the industry (*D&O\_mean*) as instrumental variables (Lin

et al., 2011). Insurance depth indicates the maturity level of an insurance market, which in turn reflects its capacity to offer professional services to customers. Consequently, companies listed in provinces with well-established insurance markets are more inclined to procure D&O insurance. Additionally, industry attributes influence a company's operational risk, with industry risk being a significant factor that drives listed companies to purchase D&O insurance. Provincial insurance depth and the average D&O insurance coverage directly influence the decision to purchase D&O insurance but do not directly affect minority shareholders' participation. The results of the first-stage regression analysis are presented in columns 1–3 of Table 4. The coefficients for both *D&O\_mean* and *Indepth* are positively and significantly associated with D&O insurance. Moreover, the *F*-statistics exceeds the threshold of 10 for weak instrumental variables. As shown in columns 4–6, the coefficients of D&O insurance are negative and significant, which corroborates our main regression.

#### 4.3.3 | Propensity score matching approach

The insufficient coverage of D&O insurance in China might incur sample selection bias. To mitigate the sample selection bias, we employ the propensity score method to examine Equation (2) by using the 1:1 neighbourhood matching principle. In the first-stage Probit model, we utilised *D&O\_mean* and *Indepth* as instrumental variables, maintaining consistency in control variables with the main regression. Following a 1:1 neighbourhood matching principle, we obtained a sample comprising 2144 observations. Subsequently, we re-estimated Equation (1) using the matched sample. The results reported in Table 5 show that the coefficient of D&O insurance is negative, at least at the 5% significance level, which is consistent with the main regression.

#### 4.3.4 | Potential reverse causality

Based on the benchmark regression, the purchase of D&O insurance influences the behaviour of minority shareholders. Conversely, minority shareholders might also suggest the purchase of D&O insurance during general shareholders' meeting. The presence of this reverse



TABLE 4 Instrumental variable regressions.

	First stage			Second stage		
	Doi	Doi	Doi	Msp	Msp	Msp
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Doi</i>				−0.0343* (−1.78)	−0.0536* (−1.65)	−0.0370** (−2.19)
<i>Indepth</i>	0.8127*** (4.96)		0.8119*** (4.95)			
<i>Doi_mean</i>		0.9741*** (16.82)	0.9759*** (15.67)			
<i>Size</i>	0.0214*** (4.28)	0.0224*** (4.44)	0.0212*** (4.24)	0.0029*** (4.01)	0.0032*** (2.81)	0.0029*** (4.16)
<i>Roa</i>	−0.1528*** (−2.88)	−0.1571*** (−2.98)	−0.1508*** (−2.87)	0.0412** (2.32)	0.0378* (1.94)	0.0408** (2.31)
<i>Lev</i>	0.0288 (1.32)	0.0220 (1.00)	0.0293 (1.35)	0.0004 (0.07)	0.0006 (0.09)	0.0005 (0.08)
<i>Fa</i>	0.0171 (0.57)	−0.0004 (−0.01)	0.0168 (0.55)	−0.0030 (−0.58)	−0.0027 (−0.50)	−0.0030 (−0.58)
<i>Indep</i>	0.1121* (1.73)	0.1263* (1.94)	0.1130* (1.74)	−0.0496*** (−8.90)	−0.0459*** (−5.48)	−0.0492*** (−8.48)
<i>Big4</i>	0.2113*** (6.18)	0.2215*** (6.45)	0.2117*** (6.15)	0.0106** (2.30)	0.0149** (2.05)	0.0112*** (2.71)
<i>Dual</i>	−0.0158** (−2.40)	−0.0141** (−2.10)	−0.0160** (−2.42)	0.0003 (0.38)	−0.0000 (−0.03)	0.0003 (0.34)
<i>Top1</i>	−0.0007** (−1.97)	−0.0006* (−1.78)	−0.0007* (−1.90)	−0.0009*** (−11.59)	−0.0009*** (−10.26)	−0.0009*** (−11.64)
<i>Top2_10</i>	0.0007* (1.83)	0.0007* (1.95)	0.0007* (1.84)	−0.0003*** (−3.86)	−0.0003*** (−3.04)	−0.0003*** (−3.84)
<i>Msh</i>	0.0178 (0.98)	0.0246 (1.27)	0.0169 (0.92)	0.0418*** (6.14)	0.0418*** (5.55)	0.0419*** (6.12)
<i>Inshare</i>	0.0008*** (3.85)	0.0008*** (3.53)	0.0008*** (3.73)	0.0002*** (3.99)	0.0002** (2.54)	0.0002*** (3.89)
<i>Ddr</i>	−0.0016 (−0.20)	−0.0030 (−0.37)	−0.0019 (−0.24)	0.0022* (1.89)	0.0021 (0.99)	0.0022* (1.88)
<i>Growth</i>	−0.0113* (−1.90)	−0.0100 (−1.80)	−0.0112* (−1.87)	−0.0035*** (−5.86)	−0.0037*** (−3.33)	−0.0035*** (−5.70)
<i>Firmage</i>	0.0492*** (3.88)	0.0493*** (3.93)	0.0493*** (3.87)	−0.0091*** (−5.82)	−0.0082*** (−3.02)	−0.0090*** (−6.00)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Constant	−0.6671*** (−5.49)	−0.6865*** (−5.66)	−0.6875*** (−5.70)	0.0282 (1.50)	0.0162 (0.53)	0.0265 (1.40)
Observations	17,480	17,480	17,480	17,480	17,480	17,480
<i>F</i> -statistics	70.18	66.59	69.12	-	-	-
Adjusted <i>R</i> <sup>2</sup> /Pseudo <i>R</i> <sup>2</sup>	0.1314	0.1248	0.1326	0.0367	0.0108	0.0340

Note: This table presents the results of instrumental variable regressions. The instrumental variables include provincial insurance depth (*Indepth*) and average insurance coverage in different industries (*Doi\_mean*). Columns 1–3 present the results of the first stage, and columns 4–6 present the results of the second stage. The *F*-statistics represents the results of the weak identification test. The *t*-statistics, reported in parentheses, are based on robust standard errors clustered at both firm and year levels. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Definitions of all variables are provided in the Table A1.

TABLE 5 Propensity score matching approach.

	Probit	OLS
	Doi	Msp
	(1)	(2)
Doi	-	-0.0054**
		(-2.13)
Size	0.2101***	0.0051***
	(6.24)	(2.83)
Roa	-1.7911	0.0810***
	(-2.49)**	(4.17)
Lev	0.6442***	0.0027
	(2.90)	(0.24)
Fa	0.3631**	-0.0092
	(1.99)	(-0.86)
Indep	1.7883***	-0.0364**
	(2.90)	(-1.96)
Big4	1.4440***	0.0014
	(15.54)	(0.22)
Dual	-0.4910***	0.0036
	(-4.72)	(0.72)
Top1	-0.0240***	-0.0009***
	(-4.34)	(-2.73)
Top2_10	-0.0020	-0.0007**
	(-0.36)	(-2.11)
Msh	-2.3323***	0.0836*
	(-2.87)	(1.90)
Inshare	0.0216***	0.0002
	(4.40)	(0.58)
Ddr	-0.1291	0.0029
	(-0.99)	(0.85)
Growth	-0.1640*	-0.0028
	(-1.85)	(-1.30)
Firmage	0.8454***	0.0058
	(7.30)	(1.09)
Indepth	13.1511***	
	(10.54)	
Doi_mean	5.3473***	
	(7.33)	
Year FE	Yes	Yes
Industry FE	Yes	Yes
Constant	-12.1904***	-0.0713*
	(-15.64)	(-1.92)
Observations	17,480	2144
Adjusted R <sup>2</sup>	0.1891	0.0732

Note: This table presents the regression results of propensity score matching. Column 1 reports the results of the probit model. Indepth and Doi\_mean are instrumental variables. In the OLS regression, the dependent variable is minority shareholders' participation. The independent variable is Doi. The *t*-statistics, reported in parentheses, are based on robust standard errors clustered at both firm and year levels. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Definitions of all variables are provided in Table A1.

causality issue could affect the main regression results. To tackle this concern, we replace the dependent variable by its variable of next periods. The test results supporting H1a are presented in Table 6.

## 5 | FURTHER ANALYSIS

### 5.1 | The channels through which D&O insurance affects minority shareholders' participation

Previous studies (Baker & Griffith, 2007; Zou et al., 2008) have argued that D&O insurance, as an external governance mechanism, can influence firm performance. Firm performance is a significant concern for minority shareholders. Since stock price is the most direct indicator of firm performance, any fluctuations in it can influence the behaviour of minority shareholders. The AGMs is convened after the release of the annual financial report by the listed company. As a result, minority shareholders are incentivised to participate in corporate decisions and monitor directors and managers when the firm's value is compromised (Xu et al., 2022). Therefore, we possess a rationale for hypothesising that firm performance significantly affects the participation of minority shareholders in the AGMs. In this section, we examine whether the purchase of D&O insurance diminishes minority shareholders' participation by influencing firm performance.

Owing to the issue of endogeneity between the mediating and dependent variables, the mediating factor test (Baron & Kenny, 1986) could produce incorrect conclusions. Shaver (2005) proposed a two-stage instrumental variable approach to estimate the mediating effect. Specifically, in the first stage, instrumental variable (CEO tenure) is utilised to predict the mediator variable (Tobin *Q*) as denoted in Equation (5). CEO tenure is recognised as an indicator of the CEO's managerial competence, significantly influencing firm performance (Hambrick & Fukutomi, 1991). However, CEO tenure exhibits a weak correlation with minority shareholders' participation. In the second stage, we utilise the predicted value of Tobin *Q* from Equation (5) to replace Tobin *Q* in Equation (6). The 2SLS approach has the advantage of mitigating the correlation between the mediating variable and the error terms  $\mu$  (error term in Equation (5)) and  $\pi$  (error term in Equation (6)). Equation (4) is the baseline regression model.

$$Msp_{i,t} = \beta_0 + \beta_1 Doi_{i,t} + \sum_{k=2}^m \beta_k Controls_{k,i,t} + \varepsilon_{i,t} \quad (4)$$

TABLE 6 Potential reverse causality.

	$\frac{Msp_{t+1}}{(1)}$
<i>Doi</i>	−0.0063*** (−2.88)
<i>Size</i>	0.0037*** (4.47)
<i>Roa</i>	0.0291** (2.37)
<i>Lev</i>	−0.0080** (−1.97)
<i>Fa</i>	−0.0076 (−1.46)
<i>Indep</i>	−0.0554*** (−5.44)
<i>Big4</i>	0.0011 (0.35)
<i>Dual</i>	0.0011 (1.03)
<i>Top1</i>	−0.0006*** (−4.79)
<i>Top2_10</i>	0.0000 (0.23)
<i>Msh</i>	0.0206* (1.70)
<i>Inshare</i>	0.0000 (0.34)
<i>Ddr</i>	0.0017 (1.07)
<i>Growth</i>	0.0007 (0.41)
<i>Firmage</i>	−0.0083*** (−3.31)
Year FE	Yes
Industry FE	Yes
Constant	0.0074
Observations	(0.42) 13,809
Adjusted $R^2$	0.0513

Note: This table presents the regression results for the replacement of independent variables with it is next period. The *t*-statistics, reported in parentheses, are based on robust standard errors clustered at both firm and year levels. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Definitions of all variables are provided in Table A1.

$$\text{Tobin } Q_{i,t} = \gamma_0 + \gamma_1 \text{Doi}_{i,t} + \gamma_2 \text{CEO tenure}_{i,t} + \sum_{k=3}^m \gamma_k \text{Controls}_{k,i,t} + \mu_{i,t} \quad (5)$$

$$\text{Msp}_{i,t} = \alpha_0 + \alpha_1 \text{Doi}_{i,t} + \alpha_2 \text{Tobin } Q_{i,t} + \sum_{k=3}^m \alpha_k \text{Controls}_{k,i,t} + \pi_{i,t} \quad (6)$$

The regression results of Equation (4) through Equation (6) are presented in columns 1–3 of Table 7. In line with our hypothesis, as shown in columns 2, CEO tenure exhibits a statistically significant positive correlation with firm performance at the 1% significance level. Additionally, the coefficient of D&O insurance also exhibits a significant positive impact, suggesting that D&O insurance enhances firm value. In the second stage, the predicted values of firm performance replace Tobin *Q* in Equation (6). As shown in column 3, both the Tobin *Q* and D&O insurance coefficients are statistically significant and negative. Additionally, we conduct a weak identification test and report a Cragg-Donald Wald *F*-statistic of 30.74. This result suggests that our instrumental variable is not a weak instrument. The Sobel *Z* value is 2.05, indicating that the mediating effect is significant. The mediating test suggests that D&O insurance diminishes minority shareholders' participation by enhancing firm performance.

## 5.2 | Effect of online voting policy

In September 2014 and January 2015, the Shenzhen Stock Exchange (SZSE) and the Shanghai Stock Exchange (SSE) respectively issued the 'Implementation Rules for Online Voting at Shareholders' Meetings of Listed Companies', hereinafter referred to as the 'Rules'. The Rules stipulate that, when listed companies convene shareholders' meetings, they must provide shareholders with online voting services in addition to on-site voting. The policy year 2014 falls within the sample period of this study, potentially affecting the baseline regression. The policy implemented in 2014 enhance the participation of minority shareholders in corporate governance (Gao et al., 2020; Yao et al., 2023). If D&O insurance reduces the engagement of minority shareholders in corporate governance, this effect should be more pronounced post-2014. Therefore, we employ Model (7) to investigate the effect of online voting.

**TABLE 7** Channels through which D&O insurance affect minority shareholders' participation.

	<b>Baseline</b>	<b>First stage</b>	<b>Second stage</b>
	<b>Msp</b>	<b>Tobin Q</b>	<b>Msp</b>
	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>
<i>Doi</i>	−0.0057*** (−2.63)	0.1340*** (4.13)	−0.0037* (−1.72)
<i>Tobin Q</i>			−0.0233** (−2.36)
<i>Tenure</i>		0.0011*** (5.54)	
<i>Size</i>	0.0022*** (2.62)	−0.5171*** (−46.06)	−0.0097* (−1.91)
<i>Roa</i>	0.0455*** (3.67)	3.3533*** (15.71)	0.1254*** (3.54)
<i>Lev</i>	−0.0005 (−0.10)	−0.1221** (−1.99)	−0.0033 (−1.02)
<i>Fa</i>	−0.0027 (−0.54)	−0.5699*** (−10.52)	−0.0170*** (−2.67)
<i>Indep</i>	−0.0519*** (−4.79)	1.1802*** (8.34)	−0.0251* (−1.76)
<i>Big4</i>	0.0043 (1.35)	0.3395*** (10.20)	0.0131*** (3.36)
<i>Dual</i>	0.0006 (0.54)	0.0221 (1.19)	0.0017 (1.40)
<i>Top1</i>	−0.0009*** (−9.60)	−0.0114*** (−10.63)	−0.0011*** (−8.44)
<i>Top2_10</i>	−0.0004*** (−3.60)	−0.0097*** (−9.09)	−0.0006*** (−4.92)
<i>Msh</i>	0.0405*** (4.31)	−0.3827*** (−3.93)	0.0304*** (3.86)
<i>Inshare</i>	0.0002* (1.94)	0.0096*** (11.50)	0.0004*** (3.49)
<i>Ddr</i>	0.0022 (1.20)	−0.2139*** (−9.32)	−0.0026 (−1.06)
<i>Growth</i>	−0.0033*** (−3.62)	−0.0031 (−0.14)	−0.0035*** (−3.04)
<i>Firmage</i>	−0.0105*** (−4.17)	0.0335 (1.48)	−0.0093*** (−5.94)
<i>F-statistic</i>		30.74	
<i>Sobel Z</i>		T = 2.05**	
<i>Year FE</i>	Yes	Yes	Yes
<i>Industry FE</i>	Yes	Yes	Yes
<i>Constant</i>	0.0481*** (3.06)	12.6948*** (53.61)	0.3418*** (2.71)

(Continues)

**TABLE 7** (Continued)

	<b>Baseline</b>	<b>First stage</b>	<b>Second stage</b>
	<b>Msp</b>	<b>Tobin Q</b>	<b>Msp</b>
	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>
Observations	17,480	17,480	17,480
Adjusted R <sup>2</sup>	0.0505	0.4202	-

Note: This table presents the regression results regarding the mediating effect of firm performance. Firm performance is measured by Tobin Q, representing the ratio of market value of equity plus book value of liabilities to total assets. The instrumental variable Tenure represents the length of the CEO's tenure. Column 1 shows the main regression results, while columns 2–3 represent the first stage and the second stage, respectively. The Sobel Z test statistic is defined as  $Z = \gamma_1 \alpha_2 / S_{\gamma_1 \alpha_2}$ , where  $S_{\gamma_1 \alpha_2} = \sqrt{(\gamma_1^2 S_{\alpha_2}^2 + \alpha_2^2 S_{\gamma_1}^2)}$ .

$$\text{Msp}_{i,t} = \beta_0 + \beta_1 \text{Doi}_{i,t} + \beta_2 \text{Doi}_{i,t} \times \text{Post}_t + \beta_3 \text{Post}_t \quad (7)$$

$$+ \sum_{k=4}^m \beta_k \text{Controls}_{k,i,t} + \varepsilon_{i,t}$$

'Post' is a dummy variable that equals 1 for years after 2014 (2014–2018) and 0 before (2011–2013). The interaction term 'Doi × Post' represents the impact of D&O insurance on the participation of minority shareholders after the implementation of the online voting policy. As seen in column 1 of Table 8, the coefficient for 'Doi × Post' is negative and statistically significant. These findings suggest that the negative correlation between the purchase of D&O insurance and the participation of minority shareholders becomes more pronounced after the implementation of the 'Rules'. This can be attributed to the reassurance provided by insurance companies, which boosts the confidence of minority shareholders. As a result, shareholders in insured companies are less likely to increase their participation in AMGs, even with the introduction of the online voting policy.

### 5.3 | Strength role of litigation risk

Mao and Meng (2013) argued that litigation risk arises from deficiencies in corporate supervision and governance mechanisms. Litigation events can result in financial losses for listed firms and, in severe cases, lead to bankruptcy. Litigation risk is a crucial concern for shareholders. Consequently, in situations where corporate litigation risks are elevated, shareholders proactively engage in corporate governance to mitigate such risks. However, D&O insurance, serving as an external mechanism, can influence the litigation risk faced by firms (Gillan & Panasian, 2015). Building on prior research (Mao &

TABLE 8 Effects of online voting and litigation risk.

	<b>Msp</b>	<b>Msp</b>
	<b>(1)</b>	<b>(2)</b>
<i>Doi</i>	−0.0033* (−1.73)	−0.0052** (−2.30)
<i>Doi</i> × <i>Post</i>	−0.0060** (−2.46)	
<i>Post</i>	0.0020*** (2.63)	
<i>Doi</i> × <i>suit</i>		−0.0006*** (−4.33)
<i>Suit</i>		0.0000 (0.71)
<i>Size</i>	0.0022*** (2.63)	0.0021*** (2.61)
<i>Roa</i>	0.0454*** (3.66)	0.0454*** (3.68)
<i>Lev</i>	−0.0005 (−0.10)	−0.0004 (−0.09)
<i>Fa</i>	−0.0027 (−0.54)	−0.0028 (−0.57)
<i>Indep</i>	−0.0521*** (−4.80)	−0.0521*** (−4.76)
<i>Big4</i>	0.0043 (1.35)	0.0043 (1.34)
<i>Dual</i>	0.0006 (0.55)	0.0006 (0.53)
<i>Top1</i>	−0.0009*** (−9.57)	−0.0009*** (−9.59)
<i>Top2_10</i>	−0.0004*** (−3.57)	−0.0004*** (−3.59)
<i>Msh</i>	0.0404*** (4.30)	0.0406*** (4.31)
<i>Inshare</i>	0.0002* (1.92)	0.0002* (1.94)
<i>Ddr</i>	0.0022 (1.19)	0.0022 (1.19)
<i>Growth</i>	−0.0033*** (−3.59)	−0.0033*** (−3.61)
<i>Firmage</i>	−0.0105*** (−4.19)	−0.0105*** (−4.17)
Year FE	Yes	Yes
Industry FE	Yes	Yes
Constant	0.0483** (3.08)	0.0485*** (3.10)

(Continues)

TABLE 8 (Continued)

	<b>Msp</b>	<b>Msp</b>
	<b>(1)</b>	<b>(2)</b>
Observations	17,480	17,480
Adjusted $R^2$	0.0506	0.0527

Note: The table reports the regression results for the effects of online voting and litigation risk. 'Post' represents the years after policy implementation, with a value of 1 assigned to the years 2014–2018 and a value of 0 for the years 2011–2013. Suit indicates the litigation risk of a listed company, calculated as the ratio of litigation amount to total assets. The *t*-statistics, reported in parentheses, are based on robust standard errors clustered at both firm and year levels. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Definitions of all variables are provided in the Table A1.

Meng, 2013), we employ the ratio of litigation amount to net assets of listed companies as a proxy variable for measuring litigation risk (Suit). The findings of the analysis are presented in column 2 of Table 8, where *Doi* × *Suit* represents the interaction between D&O insurance and litigation risk. The coefficient for *Doi* × *Suit* is −0.0006, with a corresponding *t*-test value of −4.43. The results reveal that litigation risk strengthens the negative association between D&O insurance and the participation of minority shareholders. In companies characterised by high litigation risk, D&O insurance assumes an external governance function, enhancing corporate governance and ultimately diminishing the participation of minority shareholders in AGMs.

#### 5.4 | Heterogeneity analysis base on internal control quality

The financial fraud cases of Enron and WorldCom in the United States served as catalysts for reinforcing internal control measures within companies, leading to the enactment and implementation of the SOX Act. In 2008, China introduced its own version of the 'SOX Act', known as the 'Basic Standards for Enterprise Internal Control', with the objective of enhancing the establishment and improvement of internal control systems. Internal control quality not only mirrors the effectiveness of corporate governance but also influences minority shareholders. Prior research has demonstrated that internal control deficiencies facilitate managerial concealment of unfavourable information and can potentially contribute to financial fraud (Donelson et al., 2017), thereby influencing investors' perceptions of a company's value (Beneish et al., 2008). Consequently, we utilise the internal control index from the DIB Internal Control and Risk Management Database to gauge the internal control quality of listed companies. We calculate the natural logarithm of



the internal control index and then divide the sample into two groups based on the industry median: one with high internal control quality and the other with weak internal control quality. The subgroup test results are displayed in columns 1–2 of Table 9. The results suggest a significant negative correlation between D&O insurance and the participation of minority shareholders in the subgroup with lower-quality internal controls. However, this correlation is not statistically significant in the subgroup with higher-quality internal controls. The result of the coefficient difference test ( $p = 0.05$ ) between the two groups indicates significant differences. The finding can be attributed to the increased confidence of minority shareholders in companies with higher internal control quality, thereby diminishing the prominence of the governance role played by D&O insurance. In cases where internal controls are deficient, insurance companies assume the role of overseeing and governing insured companies, consequently reducing the direct supervision exerted by minority shareholders over the companies.

### 5.5 | Heterogeneity analysis based on information disclosure quality

In 2006, the CSRC enacted the ‘Measures for the Administration of Information Disclosure of Listed Companies’ to regulate the information disclosure practices of listed companies and safeguard the legitimate rights and interests of investors. This marked the initiation of standardising information disclosure in China. Sound information disclosure mitigates information asymmetry, moral hazard, and dual agency conflicts, thereby diminishing the motivation of minority shareholders to engage in corporate governance (Armstrong et al., 2010; Li & Kong, 2013; Ruan et al., 2021). The Shanghai Stock Exchange and Shenzhen Stock Exchange report the evaluation of information disclosure quality once a year, classifying it into four grades: unqualified, qualified, good, and excellent. The samples with good and excellent evaluation results were categorised as the high disclosure quality group, while unqualified and qualified were categorised as the poor disclosure quality group. As shown in columns 3–4 of Table 9, the negative association between D&O insurance and minority shareholders’ participation is more pronounced in the subset characterised by poor disclosure quality. The results of the coefficient difference test ( $p = 0$ ) between the two groups indicate significant disparities. Sound information disclosure enables minority shareholders to promptly acquire accurate operational information from external sources, decreasing the demand for minority shareholders to attend AGMs for information acquisition. Conversely, D&O insurance plays a supervisory governance role by representing

minority shareholders in monitoring corporate governance practices in companies with deficient information disclosure quality. Consequently, the negative relationship is more significant in the subgroup of low disclosure quality.

## 6 | CONCLUSIONS

This paper aims to fill the research gap regarding the relationship between D&O insurance and minority shareholders’ participation in corporate governance. Employing a sample of listed A-shares from 2011 to 2018, we conducted an empirical investigation to investigate the impact of D&O insurance on minority shareholders’ participation. The study findings indicate that the purchase of D&O insurance by listed companies significantly reduces the enthusiasm of minority shareholders’ participation in annual general meeting. The conclusion remains valid after conducting robustness checks. The channel analysis reveals that D&O insurance plays a positive role in diminishing the involvement of minority shareholders in AGMs by primarily enhancing firm performance. Further analysis reveals that the negative correlation between the purchase of D&O insurance and the participation of minority shareholders is more pronounced after the implementation of the online voting policy. Litigation risk strengthens the negative association between D&O insurance and minority shareholders’ participation. Moreover, the negative correlation between D&O insurance and minority shareholders’ participation is more pronounced in firms characterised by weaker internal control quality or inadequate information disclosure. These findings further reinforce the conclusion that D&O insurance plays a positive role in corporate governance.

Based on the findings of this study, we develop the following policy recommendations. Firstly, the purchase of D&O insurance is instrumental in reducing the monitoring costs for minority shareholders. However, D&O insurance has limited influence in China, primarily due to its low coverage. Therefore, to strengthen the investor protection mechanism in China, it is necessary to encourage listed companies to purchase D&O insurance.

Secondly, besides the supervisory role of D&O insurance, enhancing the quality of information disclosure also serves as a means to protect investors’ rights. A sound information disclosure system can effectively mitigate opportunistic behaviour and moral hazard of directors and officers. Regulatory authorities should increase the timeliness and transparency of information disclosure by enacting legislation.

Thirdly, the opportunistic effect of D&O insurance is closely associated with the costs of misconduct. Owing to

TABLE 9 Heterogeneity analysis regression results.

	High inter control	Weak inter control	High disclosure quality	Low disclosure quality
	Msp	Msp	Msp	Msp
	(1)	(2)	(3)	(4)
<i>Doi</i>	−0.0034 (−1.43)	−0.0091*** (−3.14)	−0.0049** (−1.99)	−0.0169*** (−4.46)
<i>Size</i>	0.0022** (2.35)	0.0016* (1.61)	0.0021*** (2.63)	0.0034* (1.65)
<i>Roa</i>	0.0662*** (3.82)	0.0234 (0.99)	0.0553*** (4.24)	−0.0096 (−0.56)
<i>Lev</i>	0.0012 (0.16)	−0.0010 (−0.19)	−0.0003 (−0.06)	0.0018 (0.23)
<i>Fa</i>	−0.0059 (−1.17)	0.0003 (0.04)	−0.0038 (−0.76)	0.0075 (0.87)
<i>Indep</i>	−0.0619*** (−4.48)	−0.0430*** (−3.80)	−0.0526*** (−4.82)	−0.0433* (−1.86)
<i>Big4</i>	0.0036 (0.97)	0.0050 (1.32)	0.0042 (1.35)	0.0054 (0.62)
<i>Dual</i>	−0.0002 (−0.10)	0.0015 (1.35)	0.0005 (0.37)	0.0026 (1.04)
<i>Top1</i>	−0.0009*** (−8.20)	−0.0008*** (−7.67)	−0.0008*** (−8.55)	−0.0011*** (−6.37)
<i>Top2_10</i>	−0.0004*** (−4.32)	−0.0003* (−1.81)	−0.0003*** (−3.08)	−0.0006*** (−3.88)
<i>Msh</i>	0.0510*** (6.11)	0.0288** (2.13)	0.0370*** (3.76)	0.0602*** (3.20)
<i>Inshare</i>	0.0002*** (2.92)	0.0001 (0.97)	0.0001 (1.55)	0.0004*** (2.70)
<i>Ddr</i>	0.0037 (1.51)	0.0019 (0.99)	0.0020 (0.88)	0.0042 (0.71)
<i>Growth</i>	−0.0063*** (−4.47)	−0.0002 (−0.19)	−0.0041*** (−5.17)	0.0019 (0.76)
<i>Firmage</i>	−0.0108*** (−3.71)	−0.0104*** (−3.67)	−0.0108*** (−4.56)	−0.0085 (−1.31)
Coefficient difference test	$(p = 0.05)$		$(p = 0.00)$	
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Constant	0.0553*** (2.67)	0.0511*** (2.87)	0.0516*** (3.81)	0.0133 (0.26)
Observations	8710	8770	15,726	1754
Adjusted $R^2$	0.0494	0.0541	0.0512	0.0489

Note: This table presents the regression results for the heterogeneity analysis. The sample's internal control index is categorised as 'High internal control' when the natural logarithm exceeds the industry median, and as 'Low internal control' when it falls below the industry median. Companies rated as excellent or good are classified as 'High disclosure quality', while others are classified as 'Low disclosure quality'. The  $p$ -value is the result of the coefficient difference test. The  $t$ -statistics, reported in parentheses, are based on robust standard errors clustered at both firm and year levels. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Definitions of all variables are provided in the Table A1.

the low penalties for violations in China, directors or executives may be incentivised to act against the interests of minority shareholders. Consequently, it is imperative for regulatory bodies to enhance the laws and regulations, reduce the threshold for investor litigation, and reinforce penalties for criminal incidents. Moreover, insurance companies should diligently oversee listed companies to prevent opportunistic behaviour by directors and officers that may be incited by D&O insurance.

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## CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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## ENDNOTES

<sup>1</sup> In accordance with the 'Rules of Listed Companies' issued by the CSRC in 1997, Annual General Meetings (AGMs) are required to be held within 6 months after the fiscal year-end. During the AGMs, investors will discuss and vote on matters related to the firm's annual report, investments, financing, and so forth (Yao et al., 2023).

<sup>2</sup> \*ST is a label that signifies special treatment and indicates the potential risk of delisting. \*PT is a label that indicates companies are under suspension from trading.

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## APPENDIX

TABLE A1 Variables definition.

Variable	Variable definition
<i>Msp</i>	(Number of shares attending the AGMs—Number of shares held by shareholders over 5%)/Total number of shares in the third quarter
<i>Msp_r</i>	$Msp/(1-Msp)$
<i>AMsp</i>	The average <i>Msp</i> for all general meetings, including annual and special meetings
<i>Msp_N</i>	(Number of shareholders attending the AGMs—Number of shareholders with a shareholding ratio of more than 5%) * 100/Total number of shareholders
<i>Doi</i>	Dummy variable that equals 1 if a firm purchases D&O insurance, and 0 otherwise
<i>Doi_Buytime</i>	The duration of D&O insurance
<i>Size</i>	Natural logarithm of total assets
<i>Roa</i>	Return on assets
<i>Lev</i>	Ratio of liabilities to total assets
<i>Fa</i>	Ratio of fixed assets to total assets
<i>Indep</i>	Ratio of independent directors to total directors
<i>Big4</i>	Dummy variable that equals 1 if a firm employs Big 4 international auditor, and 0 otherwise
<i>Dual</i>	Dummy variable that equals 1 if the CEO and chairman are the same person, and 0 otherwise
<i>Top1</i>	Ratio of shares held by the largest shareholder to total shares
<i>Top2_10</i>	Ratio of the sum of shares held by the second largest shareholder to the tenth largest shareholder to the total number of shares
<i>Msh</i>	Ratio of shares held by managers to total shares
<i>Inshare</i>	Ratio of shares held by institutional investors to total shares
<i>Ddr</i>	Ratio of cash dividend to earnings
<i>Growth</i>	Growth rate of company revenue
<i>Firmage</i>	Natural logarithm of the number of years since the firm has been established
<i>Year</i>	Dummy variables on year
<i>Industry</i>	Dummy variables on industry
<i>Indepth</i>	Ratio of premium income to GDP of the province where the company is located
<i>Doi_mean</i>	Average insurance coverage for the industry to which the company belongs
<i>Tobin Q</i>	Ratio of market value of equity plus book value of liabilities to total assets
<i>Tenure</i>	Cumulative length of CEO tenure
<i>Post</i>	Dummy variable that equals 1 for the period from 2014 to 2018, and 0 for the period from 2011 to 2013
<i>Suit</i>	Ratio of litigation amount to total assets
<i>IC</i>	Internal control quality
<i>IQ</i>	Information disclosure quality