

## RESEARCH ARTICLE



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# Corporate governance and corporate social responsibility: Evidence from directors' and officers' liability insurance

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## Abstract

Theoretical theories underpin the governance effect of directors' and officers' (D&O) liability insurance include agency costs and stakeholder interests. Motivated by mixed evidence on the corporate governance effects of D&O, we ask whether and how the directors' and officers' (D&O) liability insurance affects corporate social responsibility (CSR) performance in China, one of the largest and fastest growing economies in the world. We develop two contrasting hypotheses: (1) supervision and incentives versus (2) opportunism. To test these hypotheses, we rely on Chinese A-share market data and fixed effect panel regressions, along with a battery of robustness checks, including Heckman sample selection bias, two-stage least square instrumental variable (2SLS-IV), difference-in-difference (DiD), propensity score matching (PSM) analyses. Consistent with supervision and incentives hypotheses and stakeholder theory, we find that D&O liability insurance significantly increases firm's CSR performance and firms renewing D&O liability insurance with the same insurers tend to have better CSR performance. Two possible mechanisms supporting this positive relation between D&O liability insurance and CSR performance are information transparency and accounting conservatism. Aside from theoretical contributions, our findings offer important practical contributions such as promoting D&O as external governance and ensuring the functions of D&O insurance comprehensively and correctly understood. Integrating D&O insurance with CSR can be viewed as an important business strategy by mitigating risks, enhancing reputation, ensuring legal compliance, and supporting responsible decision-making.

## KEYWORDS

accounting conservatism, corporate social responsibility, directors' and officers' liability insurance, incentive effect, information transparency, supervision effect

## 1 | INTRODUCTION

Companies may pursue their own specific Corporate Social Responsibility (CSR) initiatives differently, but the fundamental concepts of integrating environmental, social and governance considerations into business strategies are perceived as important approaches for long-term success and sustainable development. These decisions, relying heavily on the board of directors and senior management, could be risky (Hemingway & MacLagan, 2004; Yoon et al., 2006). Companies

implement business strategies to ensure their directors and officers are shielded from potential legal lawsuits by purchasing directors' and officers' (D&O) liability insurance. By providing a safety net for executives, this insurance allows them to focus on the company's long-term goals without excessive concern about their personal financial exposures, potentially fostering a culture of accountability and good governance.

The main research question of this study is to explore the impact of D&O liability insurance on CSR performance in Chinese companies.

Given the evolving landscape of corporate governance in China, we aim to understand whether D&O liability insurance, as a governance tool, can enhance CSR practices and how it interacts with the broader context of corporate responsibility.

While the global importance of CSR is well-recognized, it is particularly instructive to consider the evolution of CSR practices in China. In the past, the primary focus of many Chinese companies was predominantly on maximizing economic benefits, often at the expense of social responsibility. This approach led to negative impacts across a broad spectrum of stakeholders, including employees, shareholders, communities, and the environment. Recognizing the need for a paradigm shift, China has been transitioning towards a model of high-quality development, where the emphasis on sustainable and responsible business practices is increasingly pronounced. This evolution is reflected in a series of pivotal government initiatives, such as the “Guidelines for Social Responsibility” (2014), “Guidelines for Writing Social Responsibility Reports” (2016), and “Guidelines for Classifying Social Responsibility Performance” (2017). These policies not only aim to strengthen CSR legislation but also seek to elevate corporate awareness and commitment towards creating values that encompass economic, social, and environmental dimensions for a wider range of stakeholders. The current stage of CSR development in China is characterized by a more substantive and in-depth approach, marking a significant shift from its initial stages. This backdrop sets the stage for our study, which delves into the role of D&O in this evolving landscape, exploring how their influence can further shape and advance the CSR agenda.

Compared to developed markets, corporate governance in China is relatively low. However, China has implemented ongoing reforms and regulatory measures to enhance corporate governance to align with international standards. For example, the China Securities Regulatory Commission (CSRC) introduced guidelines and regulations to strengthen the responsibilities of boards of directors, improve transparency, and protect the rights of minority shareholders. This leads us to explore whether the introduction of D&O liability insurance in Chinese companies plays a good governance role, enhancing CSR performance.

Society's advancements have prompted a shift in corporate development philosophy, moving from solely focusing on immediate interests to prioritizing sustainable development and considering both economic and social benefits. More companies are taking on CSR responsibilities (Chen et al., 2020), which involve fulfilling economic obligations to shareholders while also addressing the needs of creditors, suppliers, consumers, employees, communities, and society. CSR has specific characteristics such as being goal-aligned, voluntary, and visible in actions. CSR can also be a powerful driver of innovation and a means of gaining a competitive edge, rather than being seen as a burden or limitation (Porter & Kramer, 2006). It is a strategic priority for businesses, and an essential consideration for senior management in all countries (Porter & Kramer, 2006). The challenge is to effectively enforce CSR rather than deciding whether to implement it (Maon et al., 2010). CSR reflects stakeholders' demands and the alignment of corporate and social interests through the application of stakeholder theory in corporate governance (Carroll, 1999; Donaldson & Dunfee, 1994) while a company is a collection of agreements made

with various stakeholders as suggested by the contract theory (Jensen & Meckling, 1976). As such balancing all stakeholders' interests and effective CSR policies is a key duty of the board of directors.

The board of directors oversees and monitors the company's business operations, ensuring that business affairs are conducted in line with all stakeholders' interests, including creditors, suppliers, consumers, employees, communities, environment, and society. To ensure good governance and long-term benefits for all stakeholders, members of board directors and senior management therefore often make difficult and strategic decisions, which could potentially create personal liability. Romano (1991) suggests that breaching duties of care and loyalty to the company's shareholders could land board directors with personal liability or lawsuits. Imposing such liability or lawsuits is a mechanism to minimize agency costs from misalignment of managerial incentives with shareholders' interests as it allows shareholders to be compensated from directors' wrongdoings (Boyer & Tennyson, 2015). To attract talented individuals to join and alleviate the concerns of directors and senior executives, encouraging them to manage confidently and innovate, company takes an insurance policy known as directors' and officers' liability insurance, which is a type of professional liability insurance that transfers the financial responsibility of directors and senior management to an insurer in case of negligence or other breaches of duty towards a third party. However, the ultimate purpose of D&O liability insurance is to safeguard the interests of stakeholders such as investors, consumers, communities, and society by providing a means for them to be compensated in case their interests are violated. D&O liability insurance originated in the 1930s, initially intended as a means of hedging against the professional liability risks of directors and executives. As the legal system improved, the professional liability risks faced by directors and senior management continued to increase, leading to growing interest in and adoption of D&O liability insurance. In the early 21st century, corporate governance scandals such as Enron and WorldCom led to an increased focus on the professional responsibilities of directors and senior management, and D&O liability insurance became more widely adopted as a hedging tool. Today, most listed companies in the United States, South Korea, and Hong Kong have D&O liability insurance. Research has shown that this type of insurance has become an important external governance mechanism and can even serve as an alternative to other mechanisms (O'sullivan, 1997).

While existing studies provide valuable insights into CSR practices and governance mechanisms, they often overlook the unique dynamics of emerging markets. Particularly, the role of specific insurance tools like D&O liability insurance in shaping CSR outcomes has not been extensively explored. Furthermore, much of the current literature is focused on Western contexts, limiting its applicability to the Chinese corporate environment, which has its own distinct characteristics and challenges.

This study addresses these gaps by specifically investigating the role of D&O liability insurance in the context of Chinese corporate governance and CSR. By focusing on China, a major emerging economy with unique regulatory and market dynamics, this research contributes to a more nuanced understanding of how governance mechanisms can influence CSR in different cultural and economic

contexts. We also explore the potential of D&O liability insurance as a tool for mitigating risks associated with CSR-related decisions, a perspective relatively unexplored in existing literature.

The Chinese context offers distinct characteristics that set it apart from scenarios explored in international studies, particularly in the realms of corporate governance and CSR. China's regulatory framework in these areas is undergoing rapid evolution, transitioning from a predominantly profit-centric approach to a more holistic model that equally values economic, social, and environmental responsibilities. This shift is not merely a result of corporate initiatives but is also significantly shaped by government policies and guidelines. In terms of market dynamics, China's unique landscape, characterized by rapid economic growth and a notable presence of state-owned enterprises, imparts distinct dynamics to the perception and implementation of corporate governance and CSR practices. In addition, cultural norms and values in China, with their emphasis on communal welfare and harmony, critically influence CSR practices. This cultural context profoundly affects stakeholder perceptions of corporate responsibilities and the accountability expected from directors and officers. Furthermore, the concept of D&O liability insurance is relatively nascent in China. Unlike in more mature markets, its role and impact on CSR in China are not as well-established or comprehensively understood. Consequently, our study delves into this relationship, considering the specific nuances of China's unique corporate and regulatory landscape, to provide deeper insights.

We use annual financial reports of A shares of Chinese listed companies from 2008 to 2018 to conduct an empirical analysis of the relationship between D&O liability insurance and corporate social responsibility. Consistent with supervision (or insurer monitoring) and incentives hypotheses, we find that the implementation of D&O liability insurance has a significant positive impact on a company's willingness to fulfill social responsibilities and the level of responsibility taken. Furthermore, as the length of time since the introduction of D&O liability insurance increases, this positive impact becomes stronger. We also discover that D&O liability insurance promotes better fulfillment of social responsibilities by enhancing the transparency of information provided by listed companies and increasing the stability of accounting.

Our contributions are fourfold. First, this is the first study that empirically examines the impact of D&O liability insurance on the performance of corporate social responsibility in Chinese stock market. D&O liability insurance is a relatively new governance mechanism in China, and research on the relationship between it and corporate social responsibility is scarce. This study broadens the understanding of the factors influencing corporate social responsibility performance. Second, our study highlights the positive impact of D&O liability insurance on social interests, which has not been previously studied. This opens a new research field on the governance effects of D&O liability insurance. Third, we identify that information transparency and accounting conservatism are the mechanisms through which D&O liability insurance affects corporate social responsibility, which provides a deeper understanding of the impact of D&O liability insurance. Fourth, we present D&O liability insurance as an alternative mechanism for implementing stakeholder theory in enterprises by balancing all stakeholder interests in organizations.

The remaining structure of this article is arranged as follows. Section 2 presents the literature review and hypotheses development. We show the research design in Section 3. Section 4 provides the empirical results of the influence of D&O liability insurance on CSR and mechanism underlying such relation, as along with a series of robustness tests and endogenous treatment. Section 5 concludes.

## 2 | LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

### 2.1 | Corporate social responsibility and its influencing factors

The successful execution of CSR has a significant impact on a company's value (Jiao, 2010). Understanding what factors drive CSR is crucial for both businesses and society. A vast number of existing studies document several factors influencing CSR, including board structure, ownership, characteristics of senior managers, firm characteristics, and others. For example, Jizi et al. (2014) argue that increasing the independence and size of the board of directors can positively contribute to the successful execution of CSR. Focusing on the effect of ownership structure on CSR, Chen et al. (2020) suggest that the presence of institutional investors and foreign shareholdings can increase corporate investment in social responsibility and motivate companies to better fulfill their social responsibilities, which aligns with the findings of Dyck et al. (2019). Cronqvist and Yu (2017) demonstrate that when a CEO has a daughter, CSR performance improves. Wang (2016) also show that the average tenure of the senior management team has a negative impact on CSR disclosure, but age and education level do not significantly affect it. Additionally, management's innovation ability, ability to manage (Yang, 2009), the proportion of female executives (Cook & Glass, 2018), past experiences of poverty, economic status, political connections among managers (Giuli & Kostovetsky, 2014), and CEO hubris (Tang et al., 2015) have all been shown to have an impact on CSR. Firm characteristics influencing CSR include firm size, profitability, and debt-to-asset ratio (see Attig et al., 2013; Bhattacharya & Korschun, 2006; Owusu-Ansah, 1998). Finally, other factors such as media supervision, institutional oversight, pressure from stakeholders, corporate culture, CEO duality are also found to significantly impact CSR (Sen & Bhattacharya, 2001; Vukic et al., 2018; Wan et al., 2020; YörüK & Zaim, 2008). However, no study has yet examined whether D&O liability insurance affects CSR initiatives. We fill this gap in literature and discuss D&O liability insurance as an emerging governance mechanism in the next section.

### 2.2 | Directors' and officers' liability insurance and corporate governance

Insurance is a system for managing risk through collective action. By paying a premium, the insured entity transfers the potential large and uncertain losses to the insurer, professionally equipped to manage risk.

To maximize its benefits, the insurer conducts risk assessments on the insured company and its directors and senior management based on management practices, stock price changes, financial data, and other information before underwriting. The results of such evaluation determine whether to insure and terms and conditions of the D&O liability insurance. Existing literature on D&O liability insurance proposes three views of D&O liability insurance as corporate governance mechanisms, including supervision, incentive, and opportunism effects.

Supervision in a corporate governance context refers to the processes of overseeing and monitoring the actions and decisions of directors and officers, ensuring alignment with the company's objectives and legal requirements, and often involves both internal controls and external checks. Incentives involve creating a structure of rewards and penalties that motivate directors and officers to act in the best interests of the company and its stakeholders, aligning their actions with the company's ethical commitments and goals. Opportunism effects, conversely, highlight the potential for individuals to act in self-interest, potentially at the expense of the company or its stakeholders. This includes scenarios where directors and officers might take undue risks or engage in unethical practices, knowing that insurance might shield them from personal financial consequences.

While the supervision and incentive effects are generally seen as good corporate governance mechanisms, the opportunism effect highlights a potential downside that needs to be managed through effective monitoring and governance practices. As noted by Holderness (1990), the supervision effect posits that the insurer acts as an active institutional governor, independent third-party supervisor and a monitoring mechanism for directors and officers. The presence of insurance coverage can enhance the oversight and accountability of directors and officers by increasing the likelihood of external scrutiny. Knowing that their actions are subject to potential liability claims, directors and officers may exercise more caution and make better-informed decisions. D&O liability insurance can be viewed as an external governance mechanism on the behavior of directors and officers, promoting responsible governance practices and reducing the likelihood of misconduct. Additionally, D&O liability insurance has a signal transmission function, meaning that the level of the premium rate is positively related to the policyholder's risk (Lin et al., 2013; O'Sullivan, 2009). D&O liability insurance also provides potential technical transmission, advanced risk management knowledge and skills to the insured entity to strengthen risk management and proactively prevent and mitigate losses. The active supervision of the insurer can reduce the frequency and intensity of liability risks faced by directors and senior management to the greatest extent. Existing literature shows that supervision effect prevents management's opportunistic behavior (Hu & Wan, 2015), corporate violations (Lei et al., 2020), reduces the cost of bank loans (Donley & Kent, 2013), pay a lower bid premium (Aguir et al., 2014), improve earnings conservatism (Liao et al., 2016), and ultimately improve company performance and value (Hwang & Kim, 2018).

Another positive governance mechanism is the incentive effect, which emphasizes that D&O liability insurance aligns the interests of directors and officers with those of shareholders and other

stakeholders. By providing insurance coverage for potential personal liabilities, D&O insurance reduces the financial risks faced by directors and officers. This, in turn, allows directors and officers to focus on maximizing firm value and acting in the best interests of shareholders without excessive concern about personal exposure (Mayers & Smith, 1982). The insurer acts as the last indemnifier, which not only enhances the insurer's supervisory motivation (Baker & Griffith, 2007) but also preserves the wealth of the directors and executives. The introduction of D&O liability insurance transfers professional risks faced by managers to the insurer, which greatly stimulates the entrepreneurial spirit of managers, encouraging them to boldly operate and innovate, and improve their risk-bearing capacity (Core, 2000). D&O insurance can incentivize directors and officers to make decisions that promote the long-term sustainability and success of the company. Existing studies show that D&O liability insurance attracts and retains outstanding management talents (Priest, 1987), motivates managers to be aggressive (Romano, 1991), prevents managers' short-sighted behavior (Core, 1997), enhances the managers' tolerance for failure, improves the company's risk-bearing capacity and promotes technological innovation (Wang et al., 2020).

Finally, the opportunistic effect highlights the potential for D&O liability insurance to create moral hazard (Bolton et al., 2006) or opportunistic behavior (Kim, 2006). The insurance coverage potentially encourages directors and officers to take on more risk or engage in opportunistic activities, knowing that they are protected from personal financial losses and hence intensifies agency costs. This view recognizes that D&O insurance could inadvertently increase the likelihood of reckless decision-making or misconduct by reducing the direct financial consequences faced by directors and officers. Existing studies suggest that D&O liability insurance weakens directors and senior management fiduciary responsibility and alter their cautious approach (Parsons, 2003), increases a company's financing costs (Chen et al., 2016) and audit fees (Chung & Wynn, 2014; Li & Liao, 2017), supports the opportunism theory (Boubakri & Bouslimi, 2016). A summary of main studies on D&O insurance is included in Appendix B.

### 2.3 | Hypothesis development

D&O liability insurance directly safeguards the interests of directors and senior managers, and indirectly protects the interests of the stakeholder group. In the event that the stakeholder group's interests are harmed, compensation can be obtained through D&O liability insurance. Stakeholders include not only shareholders and creditors, but also consumers, suppliers, communities, governments, society, and the environment. As such, the purpose of D&O liability insurance aligns with the goal of corporate social responsibility. However, the relationship between D&O liability insurance and CSR performance is complex and depends on various factors such as the company's existing commitment to CSR and overall governance practices. Both positive and negative relations between D&O liability insurance and CSR performance are possible as shown in Figure 1.

### 2.3.1 | The relation between D&O liability insurance and CSR performance

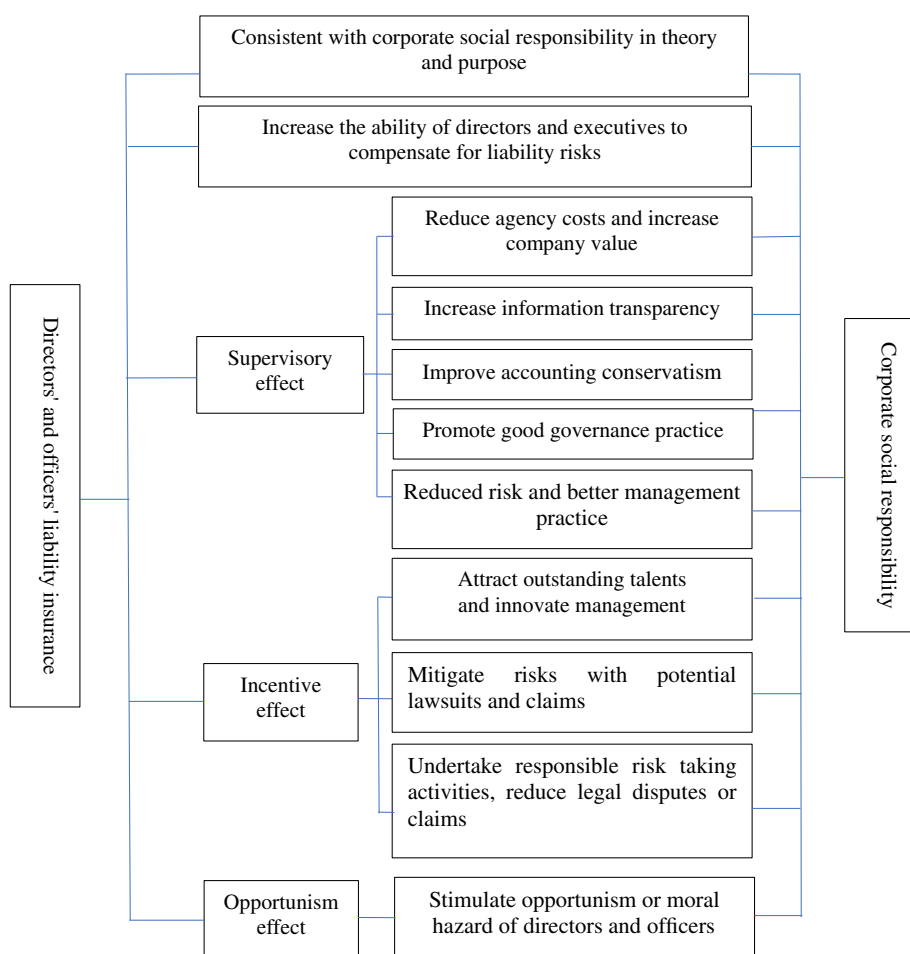
D&O liability insurance is an important governance mechanism that influences the business decision-making of a company, and in turn, impacts the performance of CSR. Effective corporate governance practices, clear CSR strategies, and a strong ethical culture within the organization are crucial for ensuring that D&O liability insurance complements and reinforces CSR performances rather than substituting or undermining them. According to *supervision or insurer's monitoring and incentives hypotheses*, a positive relation between D&O liability insurance and CSR performance is expected. On the contrary, the *opportunistic and agency costs hypotheses* suggest a negative relation between the two.

According to the *supervision or insurer's monitoring hypothesis*, insurance companies play an active role as monitors and risk managers for the firms they provide coverage to, thereby fostering the adoption of sound governance practices (Holderness, 1990). Similarly, the *incentives hypothesis* serves to not only attract highly skilled individuals but also alleviate concerns among directors and executives, motivating them to utilize their expertise, drive innovation, enhance operational efficiency, and have the flexibility to engage in riskier endeavors that yield long-term advantages for the companies. These hypotheses promote good governance and a conscious commitment to act in the best interest of all stakeholders, leading to increased

dedication towards CSR initiatives. Bases on these hypotheses, we expect a positive relation between D&O liability insurance and CSR performance as follows:

**Hypothesis 1a.** According to the supervision or insurer's monitoring theory, the introduction of D&O liability insurance is posited to enhance CSR.

Alternatively, the *opportunistic hypothesis* suggests that D&O liability insurance transfers the liability of directors and officers to the insurer, potentially giving rise to opportunistic or moral hazard behaviors. In this view, the insurance coverage reduces the consequences and legal effectiveness of their actions, potentially motivating directors, and executives to prioritize their personal interests over those of the company. This is also consistent with the *agency cost hypothesis*, suggesting that the existence of a misalignment of interests between shareholders and management (Jensen & Meckling, 1976). D&O liability insurance absolves directors and officers of personal liability resulting from their management decisions, granting them the liberty to pursue self-interests and potentially engage in riskier behaviors and short-term investments. This shift in focus may lead to a diminished emphasis on CSR initiatives, as management allocates resources towards immediate gains and personal advantages rather than long-term sustainability and stakeholder concerns. Consequently, the presence of D&O liability insurance could



**FIGURE 1** Diagram of the relationship between directors' and officers' liability insurance and corporate social responsibility. This figure illustrates the relationship between D&O liability insurance and CSR. We include possible channels on how the introduction of D&O liability insurance can have an impact on CSR.



weaken the dedication to CSR, as managers may display less regard for the impact of their actions on the company's social and environmental performance. As a result, a negative association between CSR and D&O liability insurance is anticipated.

**Hypothesis 1b.** According to the opportunistic behavior hypothesis, the introduction of D&O liability insurance may lead to a reduction in CSR.

### 2.3.2 | Underlying mechanisms of the relation between D&O liability insurance and CSR performance

According to the *supervision hypothesis*, the supervisory role of D&O liability insurance can contribute positively to CSR. The introduction of D&O liability insurance has the potential to enhance external oversight and reduce various agency costs, ultimately increasing the company's value and its capacity to fulfill social responsibilities. The underlying mechanism of this positive prediction can be derived from information transparency. Based on the *information transparency hypothesis*, D&O liability insurance leads insurers to play supervising roles, resulting in greater transparency of information within listed companies, encouraging them to embrace social responsibility. D&O insurers require detailed financial information from the policyholders as part of the underwriting and renewal processes. This heightened scrutiny and information requirement promote greater financial transparency within the company (Liou et al., 2016). A high level of information transparency is crucial for companies to actively engage in social responsibility and serves as a fundamental requirement for safeguarding the interests of various stakeholders.

**Hypothesis 2a.** The implementation of directors' and officers' liability insurance enhances information transparency, thereby fostering an environment conducive to increased CSR initiatives.

Another possible channel underlying the positive relation between D&O liability insurance and CSR performance, derived from the *supervision hypothesis* is based on accounting conservatism. D&O insurers have a vested interest in reducing the likelihood of claims and legal liabilities against directors and officers. To achieve this risk mitigation, they actively monitor the financial decisions and practices of the policyholders. By encouraging conservative accounting practices, insurers aim to minimize the potential financial risks that may arise from aggressive or overly optimistic accounting practices. Additionally, by promoting accounting conservatism, insurers align the interests of directors and officers with the insurer's objectives of minimizing potential claims. This alignment encourages responsible financial management and a cautious approach to accounting practices. This is known as *accounting conservatism hypothesis* as follows.

**Hypothesis 2b.** The implementation of directors' and officers' liability insurance enhances accounting conservatism, thereby fostering an environment conducive to increased CSR initiatives.

### 2.3.3 | The duration of D&O liability insurance and CSR performance

The acquisition cost of D&O liability insurance is relatively high, as both the policyholder and the insurer exercise caution before entering into a contract. The company dedicates more time to researching potential insurers, while the insurer conducts a comprehensive risk assessment of the company. Once a contract is established, both parties work to maintain the relationship and regularly renew the contract. This ongoing process allows the insurer to enhance their supervisory capabilities and reduce information asymmetry, leading to increased transparency (Ling & Bai, 2017). As the duration since the introduction of D&O liability insurance extends, companies develop a better understanding of the insurance's value and benefits. This, in turn, contributes to improved management, heightened financial stability, and increased attractiveness to talented individuals. Furthermore, as compensation for directors and executives improves, investors and consumers gain greater awareness of the mechanisms in place to safeguard their own interests. In sum, as the duration of D&O liability insurance introduction lengthens, companies assume more corporate social responsibilities from both their own perspective and that of related stakeholders, leading to our third hypothesis as follows.

**Hypothesis 3.** The longer the duration of D&O liability insurance, the higher the CSR performance.

## 3 | RESEARCH DESIGN

### 3.1 | Data

Sample contains China's A-share listed companies between 2008 and 2018. CSR data is sourced from the CSMAR corporate responsibility database, while data used in the robustness test is obtained from [Hexun.com](http://www.hexun.com)'s corporate responsibility evaluation database and Runling Global's corporate responsibility evaluation database. Data on D&O liability insurance is collected by manually extracting information from the database of listed companies on [Bjinfobank.com](http://www.bjinfobank.com). In contrast, other financial variables are sourced from the CSMAR database. We exclude companies from the financial and insurance industries, as well as those with missing data or abnormal financial conditions, resulting in a final sample of 26,215 annual observations from 3482 companies.

### 3.2 | Variables

#### 3.2.1 | Dependent variables

Two measures are employed to evaluate CSR performance. First, the *CSR-Dum report* serves as a binary variable, with a value of 1 indicating that a company has released a CSR report, and 0 indicating otherwise. This variable represents the company's inclination towards embracing corporate social responsibility. Berthelot et al. (2012) use a dichotomous variable, indicating whether firm published a sustainability

report. Giannarakis et al. (2016) refer to Berthelot et al. (2012) and state that investors interpret the publishing of CSR information as a sign of a company's credibility. Giannarakis et al. (2016) employ corporate social disclosure (CSD) as a proxy of CSR performance. Additionally, Nazari et al. (2017) document that CSR disclosure and readability of CSR report are positively related with CSR performance and suggest that CSR disclosure increases transparency regarding firms' social and environmental performance.

Second, we create *CSR-Sum* as a measure to quantify the number of CSR activities disclosed by the company. This measure not only determines whether a CSR report has been issued, but also offers insights into the level of comprehensiveness and depth of the report. We consider various factors in forming this second measure such as third-party verification of the report, adherence to the GRI Sustainability Reporting Guidelines, and coverage of topics like shareholder rights, employee rights, and environmental sustainability, among others. A higher number of CSR activities reported by a company indicates a stronger commitment to social responsibility and reflects better performance in terms of fulfilling social responsibilities.

### 3.2.2 | Independent variables

In China, it is not mandatory to disclose whether D&O liability insurance is purchased but the approval of such purchase by the board of directors and the general meeting of shareholders falls within the scope of mandatory information disclosure. In this study, the database of listed companies from [Bjinfobank.com](http://Bjinfobank.com) is utilized to identify instances of D&O liability insurance purchases by companies and to establish the timing of such purchases. To validate this information, [cninfo.com](http://cninfo.com) is used for confirmation. Following Jia and Tang (2018), two measures of D&O liability insurance are adopted. First, the *Doi* serves as a binary variable, with a value of 1 indicating that a company purchases D&O liability insurance and 0 indicating otherwise. Second, *Doitime* represents the duration since a company purchases D&O liability insurance, measured as the natural logarithm of the number of years plus one. This variable is used to examine if the governance effect of D&O liability insurance changes over time.

### 3.2.3 | Control variables

We control for variables found to affect CSR performance in existing literature (see for example, Tang et al., 2018). These include: (1) board characteristics such as board size, leadership structure, independence, educational level, and gender; (2) equity structure variables such as the shareholding ratio of the largest shareholder, institutional investors, and management; (3) firm characteristics such as size, profitability, debt-to-asset ratio, cash flow, growth rate, time on the stock market, and effective tax rate. We also include industry and year fixed effect. The full list of variables and the definition is included in Appendix A.

## 3.3 | Method

To test our main hypotheses, we estimate the following regression:

$$y_{i,t} = \alpha_0 + \alpha_1 X_{i,t} + \sum \alpha_j Controls_{i,t} + \sum Year + \sum Ind + \varepsilon_{i,t}, \quad (1)$$

where,  $y_{i,t}$  is either *CSR-Dum* or *CSR-Sum* and  $X_{i,t}$  is either *Doi* or *Doitime*. We estimate Model 1 with the logit regression for our dependent variable *CSR-Dum*, which is a dummy variable and the OLS regression for our dependent variable *CSR-Sum*. To mitigate the influence of outliers on the regression outcomes, we winsorize all continuous variables. This process involves truncating extreme values beyond the 1st and 99th percentiles.

## 3.4 | Descriptive statistics

Table 1 provides summary statistics of all variables included in our analyses. We find 23.28% of the sample issuing CSR reports with the average number of CSR activities of 1.414. This suggests that a majority of companies have not yet issued such reports, indicating that CSR is still in its early stages with a relatively low level of CSR activities for Chinese listed companies. Furthermore, only 4.27% of the sample have purchased D&O liability insurance, which is a significant difference compared to Western countries (e.g., Boyer and Tennyson [2015] describe a mean of 74% in their Canadian sample), indicating that most Chinese listed companies do not place a high importance on this governance mechanism. The average length of time for the introduction of D&O liability insurance is also found to be 0.0892.

Table 2 reports the correlation matrix and indicates that the introduction of D&O liability insurance has a statistically significant positive correlation at the 1% level with both *CSR-Dum* and *CSR-Sum*, indicating that the implementation of D&O liability insurance can significantly improve a company's ability to take on social responsibility. Additionally, there is a statistically significant positive correlation at the 1% level between the length of time for introducing D&O liability insurance and both *CSR-Dum* and *CSR-Sum*, which suggests that the longer a company has D&O liability insurance, the more it promotes corporate social responsibility. These preliminary results point towards positive relation between D&O liability insurance and CSR.

## 4 | THE RELATION BETWEEN D&O LIABILITY INSURANCES AND CSR

### 4.1 | Baseline fixed effect regressions

Table 3 presents the results of the fixed effect regression analysis on the impact of D&O liability insurance on CSR. Columns 1–4 of Table 3 indicate a statistically significant positive relation between D&O liability insurance and CSR performance at the 1% level. Our findings support *supervision and incentives hypotheses*. Columns 5–8 of Table 3 also indicate a statistically significant positive relation between the

**TABLE 1** Descriptive statistics.

Variables	N	Mean	SD	p50	Min	Max
CSR-Dum	26,215	0.2328	0.4227	0.0000	0.0000	1.0000
CSR-SUM	26,215	1.4140	3.0162	0.0000	0.0000	12.0000
Doi	26,215	0.0427	0.2022	0.0000	0.0000	1.0000
Doitime	26,215	0.0892	0.4356	0.0000	0.0000	2.5649
Board	26,215	2.1441	0.1998	2.1972	1.6094	2.7081
Dual	26,215	0.2554	0.4361	0.0000	0.0000	1.0000
Indep	26,215	0.3730	0.0527	0.3333	0.3333	0.5714
Share1	26,215	0.3515	0.1501	0.3323	0.0877	0.7496
Inst	26,215	0.0620	0.0759	0.0349	0.0000	0.7505
Mshare	26,215	0.0966	0.1747	0.0000	0.0000	0.6693
Soe	26,215	0.0561	0.1452	0.0000	0.0000	0.6846
Roa	26,215	0.0372	0.0619	0.0373	-0.2666	0.1952
Cash	26,215	0.0415	0.0746	0.0414	-0.1961	0.2479
Growth	26,215	0.1894	0.4937	0.0989	-0.5915	3.3900
Taxrate	26,215	0.0095	0.0093	0.0076	-0.0075	0.0468
Size	26,215	21.9779	1.2992	21.8074	19.3489	25.9794
Lev	26,215	0.4357	0.2184	0.4268	0.0482	0.9734
Age	26,215	2.0135	0.9179	2.1972	0.0000	3.3673
Phd	26,215	0.0778	0.0814	0.0588	0.0000	0.3333
Gender	26,215	0.1749	0.1071	0.1600	0.0000	0.4706
Salary	26,215	15.0914	0.7717	15.0891	13.1022	17.0957
Control	26,215	0.4740	0.4993	0.0000	0.0000	1.0000

Note: This table provides descriptive statistics for the variables used in this study. Our sample spans from 2008 to 2018. Variable definitions are included in Appendix A.

duration of D&O liability insurance and CSR performance at the 1% level and support our hypothesis 3 such that the longer the duration, the higher the CSR performance.

In general, the sign of most control variables is consistent with existing literature. We find board size, proportion of independent directors, proportion of institutional shareholding, profitability, cash flow, growth, firm's age and effective tax rate are all positively related with CSR performance (e.g., see Tang et al. [2018]). The only exception is leverage, which is inversely related to CSR performance. This indicates the higher the leverage, the more debt the company has, leaving less funds for work related to CSR activities (Drobetz et al., 2014).

## 4.2 | Robustness checks

### 4.2.1 | Alternative measures of CSR

To ensure that our findings are robust to different proxies of CSR performance, we re-estimate Model 1 using alternative CSR measures from various agencies as follows: (1) ESG score by Bloomberg ESG for the period of 2011–2018; (2) HZESG database by Shanghai Huazheng Index Information Service Co., Ltd. for the period of 2009–2018;

(3) HXCSR and HXSCSR scores by [Hexun.com](http://Hexun.com), for the period of 2010–2018; (4) CSR ratings by Rankins for the period of 2009–2018.<sup>1</sup> The basis for the Bloomberg ESG index lies in the disclosure of information by publicly listed companies regarding key areas such as the environment, social responsibility, and corporate governance. Taking into account the unique characteristics of ESG information disclosure in China, the HZESG database is based on the public disclosure data of listed companies in China such as social responsibility reports, sustainable development reports, national regulatory announcements and news media reports. Although the CSR reporting in China is voluntary, the disclosure on such information must comply with the rules and regulations. Given the extensive information contained in CSR reports, it becomes challenging for readers to conduct a comprehensive evaluation. To address this, [Hexun.com](http://Hexun.com) assesses these reports from a professional standpoint, considering factors such as the report's standards and level of completeness and provide two types of scores: (1) the comprehensive social responsibility report score (HXCSR), and the company's responsibilities towards shareholders, employees, suppliers, customers and consumers, the environment, and other stakeholders score (HXSCSR). Rankins is an agency

<sup>1</sup>Sample period for each alternative measure of CSR performance is restricted by the availability of data.



TABLE 2 Correlation matrix.

Variables	CSR-Dum	CSR-sum	Doi	Doitime	Board	Dual	Indep	Share1	Inst	Mshare	Soe	Roa	Cash	Growth	Taxrate	Size	Lev	Age	Phd	Gender	Salary
CSR-Sum	0.85***																				
Doi	0.14***	0.13***																			
Doitime	0.13***	0.12***	0.97***																		
Board	0.14***	0.14***	0.07***	0.07***																	
Dual	-0.10***	-0.09***	-0.07***	-0.07***	-0.17***																
Indep	0.02***	0.01	0.02***	0.02***	-0.50***	0.10***															
Share1	0.09***	0.08***	0.04***	0.04***	0.02***	-0.04***	0.04***														
Inst	0.13***	0.12***	0.04***	0.04***	0.06***	-0.02***	-0.01	-0.09***													
Mshare	-0.16***	-0.13***	-0.11***	-0.11***	-0.19***	0.26***	0.07***	-0.08***	-0.09***												
Soe	0.02	0.03***	0.05***	0.04***	0.16***	-0.13***	-0.04***	0.25***	-0.01	-0.19***											
Roa	0.05***	0.06***	-0.02***	-0.02***	0.02***	0.06***	-0.03***	0.13***	0.19***	0.17***	-0.01										
Cash	0.07***	0.07***	0.02***	0.02***	0.06***	-0.02***	-0.03***	0.09***	0.11***	-0.03***	0.05***	0.34***									
Growth	-0.02***	-0.02***	-0.01	-0.01	-0.02***	0.01	0.01	0.01*	0.08***	-0.01	0.06***	0.17***	0.01								
Taxrate	0.05***	0.06***	0.01	0.01	0.01	0.02***	-0.01	0.14***	0.17***	0.06***	-0.01	0.57***	0.35***	0.12***							
Size	0.44***	0.34***	0.22***	0.21***	0.26***	-0.17***	0.02***	0.22***	0.21***	-0.23***	0.14***	0.02***	0.06***	0.07***	0.02***						
Lev	0.13***	0.11***	0.12***	0.12***	0.15***	-0.16***	-0.01***	0.04***	0.03***	-0.36***	0.10***	-0.39***	-0.15***	0.05***	-0.24***	0.43***					
Age	0.20***	0.15***	0.15***	0.16***	0.11***	-0.24***	-0.02***	-0.10***	0.11***	-0.58***	0.01*	-0.24***	-0.01	0.04***	-0.11***	0.35***	0.42***				
Phd	0.05***	0.04***	0.05***	0.04***	-0.01	0.07***	0.05***	-0.01	0.06***	0.13***	-0.03***	0.07***	0.02***	0.01***	0.03***	0.07***	-0.1***	-0.16***			
Gender	-0.12***	-0.13***	-0.08***	-0.07***	-0.18***	0.12***	0.06***	-0.08***	-0.01	0.14***	-0.15***	0.03***	-0.01*	0.02***	0.06***	-0.18***	-0.13***	-0.06***	0.01		
Salary	0.29***	0.21***	0.10***	0.09***	0.17***	-0.05***	-0.01*	0.02***	0.21***	-0.03***	-0.04***	0.19***	0.11***	0.03***	0.18***	0.54***	0.07***	0.07***	0.17***	-0.04***	
Control	0.19***	0.18***	0.13***	0.13***	0.22***	-0.25***	-0.05***	0.17***	0.05***	-0.36***	0.36***	-0.09***	0.04***	-0.02***	-0.06***	0.30***	0.25***	0.36***	-0.06***	-0.19***	0.06***

Note: This table presents the correlation matrix of our variables of interest.

\*\*\*, \*\*, and \* indicate that there is a correlation at the level of 10%, 5%, and 1%, respectively.

**TABLE 3** The effect of D&O liability insurance on CSR performance.

Variables	(1) CSR-Dum	(2) CSR-Dum	(3) CSR-sum	(4) CSR-sum	(5) CSR-Dum	(6) CSR-Dum	(7) CSR-sum	(8) CSR-sum
<i>Doi</i>	1.2175*** (18.92)	0.2233*** (2.83)	1.6681*** (14.98)	0.4723*** (4.54)				
<i>Doitime</i>					0.5231*** (17.11)	0.0750** (2.06)	0.7082*** (13.66)	0.1846*** (3.83)
<i>Board</i>		0.4739*** (4.59)		0.3157*** (2.81)		0.2533** (2.42)		0.3158*** (2.81)
<i>Dual</i>		−0.1256*** (−2.89)		−0.0649* (−1.71)		−0.0839* (−1.90)		−0.0647* (−1.70)
<i>Indep</i>		1.3192*** (3.66)		1.6153*** (4.09)		1.1130*** (3.06)		1.6201*** (4.10)
<i>Share1</i>		−0.0630 (−0.51)		0.0233 (0.18)		−0.0106 (−0.09)		0.0215 (0.17)
<i>Inst</i>		0.7690*** (3.48)		0.0937 (0.38)		0.6057*** (2.75)		0.0835 (0.34)
<i>Mshare</i>		−0.6622*** (−4.23)		−0.1489 (−1.38)		−0.4928*** (−3.15)		−0.1478 (−1.37)
<i>Soe</i>		−0.7357*** (−5.45)		−0.9059*** (−6.14)		−0.9567*** (−6.97)		−0.9040*** (−6.13)
<i>Roa</i>		1.9121*** (3.94)		0.3061 (1.03)		1.3440*** (2.78)		0.2974 (1.00)
<i>Cash</i>		0.8686*** (3.24)		0.8553*** (3.48)		0.7968*** (2.92)		0.8573*** (3.49)
<i>Growth</i>		−0.3221*** (−8.24)		−0.2267*** (−6.96)		−0.2847*** (−7.08)		−0.2271*** (−6.97)
<i>Taxrate</i>		3.3930 (1.36)		9.3511*** (4.10)		1.7880 (0.71)		9.3603*** (4.10)
<i>Size</i>		0.8881*** (44.99)		0.7181*** (34.81)		0.7989*** (37.24)		0.7211*** (35.00)
<i>Lev</i>		−1.1596*** (−10.33)		−0.6749*** (−7.20)		−1.1789*** (−10.36)		−0.6762*** (−7.21)
<i>Age</i>		0.3109*** (11.11)		0.2002*** (8.27)		0.2825*** (9.84)		0.2007*** (8.29)
<i>Phd</i>		0.8361*** (3.94)		1.2112*** (5.47)		0.6903*** (3.25)		1.2276*** (5.55)
<i>Gender</i>		−0.8643*** (−4.92)		−0.7696*** (−4.79)		−0.7023*** (−3.94)		−0.7711*** (−4.80)
<i>Salary</i>				0.2856*** (9.65)		0.3198*** (11.10)		0.2871*** (9.70)
<i>Control</i>				0.2564*** (5.61)		0.3693*** (8.56)		0.2579*** (5.64)
<i>Ind</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Year</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Constant</i>	−2.4125*** (−15.69)	−22.8260*** (−45.83)	0.4935*** (3.29)	−19.9459*** (−38.70)	−2.3825*** (−15.55)	−25.0675*** (−45.47)	0.5130*** (3.42)	−20.0266*** (−38.90)
<i>N</i>	26,203	26,203	26,215	26,215	26,203	26,203	26,215	26,215

(Continues)

TABLE 3 (Continued)

Variables	(1) CSR-Dum	(2) CSR-Dum	(3) CSR-sum	(4) CSR-sum	(5) CSR-Dum	(6) CSR-Dum	(7) CSR-sum	(8) CSR-sum
Pseudo $R^2$ /Adj- $R^2$	0.047	0.2240	0.0778	0.2033	0.0452	0.2271	0.0758	0.2030
Wald $\chi^2/F$	1120.16	4150.2	134.4884	142.3644	1071.68	4158.31	132.4626	142.0337

Note: This table presents the baseline regressions results. Variable definitions are included in Appendix A. We perform Logit regressions in Columns (1)–(4), and OLS regressions in Columns (5)–(8).

\*, \*\*, and \*\*\* indicate that there is a significance at the level of 10%, 5%, and 1%, respectively.

dedicated to providing objective and scientific information on CSR to investors, consumers, and the public by assign CSR ratings to Chinese listed firms. For all these alternative proxies of CSR performance, the higher the score (or ratings), the better the CSR performance. Table 4 reports the results of the fixed effect regression analyses on the impact of D&O liability insurance on CSR, based on various proxies of CSR and confirms findings in Table 3. As such, our results are robust to different measures of CSR.

#### 4.2.2 | Heckman two-stage analysis

To address the potential self-selection bias in determining whether to introduce D&O liability insurance, we employ Heckman's two-stage analysis, using a probit in the first stage. The industry average of D&O liability insurance (INDDOI) is used as an instrumental variable, as companies in industries with higher averages are more likely to introduce D&O liability insurance, but this variable does not affect a company's social responsibility. We also include proportion of director societies in management, proportion of women in management, ratio of board members with overseas experience, company characteristics, and equity characteristics. The Inverse Mills Ratio (IMR) is calculated based on estimates of the first stage probit regression. We include IMR in the second-stage regression to estimate the relation between D&O liability insurance and CSR performance. Table 5 reports results from Heckman's two-stage regression and confirms our main findings reported in Table 3 of a positive relation between D&O liability insurance and CSR performance. As such, our results are robust to self-selection bias.

#### 4.2.3 | Difference-in-difference (DID) regression method

To alleviate potential endogeneity concerns, we adopt the following DID estimation:

$$CSR_{i,t} = \alpha_0 + \alpha_1 Policy_{i,t} + \alpha_2 Treat + \alpha Control_{i,t} + \varepsilon_{i,t}, \quad (2)$$

where, *Policy*, the main explanatory variable, is a binary variable with a value of 1 indicating that the company obtained liability insurance

after the specified year, and 0 indicating otherwise. Another explanatory variable is *Treat*, which takes a value of 1 for the experimental group (companies that have purchased D&O liability insurance) and 0 otherwise. We focus on the coefficient estimate of *Policy*, measuring the impact of the experimental group on corporate social responsibility before and after purchasing D&O liability insurance. If the coefficient of *Policy* is significantly greater than zero, it suggests that the introduction of D&O liability insurance positively impacts corporate social responsibility. Table 6 reports our DID analyses, indicating that D&O liability insurance can significantly enhance the level and willingness of corporate social responsibility. Again, our results confirm our main findings reported in Table 3 and are less likely to suffer from endogeneity but more likely to show a causal relation between D&O liability insurance and CSR performance.

#### 4.2.4 | Two-stage least square instrumental variable (2SLS)

We employ the 2SLS method for regression to alleviate endogeneity concerns. Following Yuan et al. (2016) and Jia and Tang (2018), we use the industry average of directors' and officers' liability insurance and location in eastern provinces as instrumental variables. Table 7 reports results of the 2SLS analyses and indicates that the two instrumental variables are highly correlated with *Doi*, meeting the requirement for instrumental variables. The *F* value in the first stage is 27.26, which is well above the threshold of 10, indicating that the instrumental variables are not weak. The coefficient for *Doi* in column (2) is positive, indicating that even after addressing endogeneity, D&O liability insurance still has a significant positive relationship with CSR at the 1% level and confirms our main findings reported in Table 3.

#### 4.2.5 | Propensity score matching (PSM)

Given that only a small percentage (4.27%) of the companies in our sample adopt D&O liability insurance, there is a potential for endogeneity issues. To address this, we use the PSM method to match companies adopting D&O liability insurance with those not adopting, on a 1:1 basis and then conduct a regression on the matched sample. Table 8 presents the PSM results and indicates a significant positive relation between D&O liability insurance and CSR performance.

TABLE 4 The relation between D&amp;O liability insurance and CSR using various proxies of CSR.

Variables	Bloomberg ESG	BloombergESG	HZESG	HZESG	HXCSR	HXSCSR	HXCSR	HXSCSR	RCSR	RCSR
<i>Doi</i>	0.0843*** (7.30)		0.1268*** (3.93)		1.0169* (1.81)	0.2271* (1.78)			0.0623*** (5.00)	
<i>Doitime</i>		0.0386*** (7.77)		0.0601*** (4.11)			0.2196 (0.89)	0.1252*** (2.14)		0.0348*** (6.20)
<i>Board</i>	0.0247 (1.48)	0.0244 (1.46)	0.0738* (1.80)	0.0736* (1.79)	1.2321** (2.06)	0.0358 (0.23)	1.2339** (2.06)	0.0348 (0.22)	0.0813*** (4.20)	0.0811*** (4.19)
<i>Dual</i>	-0.0288*** (-3.84)	-0.0287*** (-3.82)	-0.0668*** (-4.46)	-0.0667*** (-4.45)	-0.1727 (-0.91)	-0.0008 (-0.02)	-0.1731 (-0.91)	-0.0005 (-0.01)	-0.0153* (-1.75)	-0.0152* (-1.74)
<i>Indep</i>	0.0795 (1.35)	0.0755 (1.29)	1.5913*** (11.17)	1.5894*** (11.16)	6.5385*** (3.05)	1.2014** (2.20)	6.5989*** (3.08)	1.1925** (2.19)	0.0334 (0.52)	0.0298 (0.46)
<i>Share1</i>	-0.0050 (-0.25)	-0.0069 (-0.34)	0.0730 (1.55)	0.0725 (1.53)	1.9347*** (2.87)	0.1473 (0.85)	1.9303*** (2.86)	0.1466 (0.84)	0.1054*** (4.47)	0.1024*** (4.34)
<i>Inst</i>	-0.2193*** (-5.69)	-0.2215*** (-5.75)	0.4924*** (5.43)	0.4900*** (5.40)	4.2851*** (3.10)	-1.1006*** (-3.39)	4.2541*** (3.08)	-1.1045*** (-3.40)	-0.1486*** (-3.27)	-0.1486*** (-3.27)
<i>Mshare</i>	0.0502 (1.64)	0.0478 (1.56)	0.4550*** (10.34)	0.4543*** (10.32)	1.5056*** (2.85)	-0.1694 (-1.25)	1.5164*** (2.87)	-0.1721 (-1.27)	0.1453*** (4.05)	0.1416*** (3.95)
<i>Soe</i>	-0.0864*** (-3.36)	-0.0871*** (-3.39)	-0.4630*** (-8.39)	-0.4620*** (-8.36)	-1.7290** (-1.96)	-0.6451*** (-3.51)	-1.7424** (-1.98)	-0.6424*** (-3.50)	-0.0445 (-1.64)	-0.0432 (-1.60)
<i>Roa</i>	0.0183 (0.25)	0.0175 (0.24)	1.5827*** (9.77)	1.5804*** (9.76)	73.7233*** (41.06)	6.8375*** (9.82)	73.7082*** (41.06)	6.8338*** (9.81)	-0.0151 (-0.17)	-0.0162 (-0.18)
<i>Cash</i>	0.2083*** (4.40)	0.2081*** (4.40)	0.0457 (0.47)	0.0458 (0.47)	0.9704 (0.75)	-2.6768*** (-6.82)	0.9807 (0.76)	-2.6764*** (-6.82)	0.1777*** (3.28)	0.1770*** (3.26)
<i>Growth</i>	-0.0366*** (-5.64)	-0.0367*** (-5.65)	-0.1493*** (-10.59)	-0.1493*** (-10.59)	-0.6007*** (-3.54)	0.0348 (0.59)	-0.6037*** (-3.56)	0.0351 (0.60)	-0.0116 (-1.26)	-0.0116 (-1.26)
<i>Taxrate</i>	-0.9000** (-2.29)	-0.8964** (-2.28)	1.2669 (1.36)	1.2618 (1.35)	251.2469*** (19.80)	131.4171*** (29.36)	251.3297*** (19.81)	131.3999*** (29.36)	-0.2030 (-0.42)	-0.1873 (-0.39)
<i>Size</i>	0.0668*** (19.54)	0.0671*** (19.66)	0.2494*** (31.50)	0.2496*** (31.58)	3.5835*** (31.89)	0.3770*** (12.82)	3.5988*** (32.02)	0.3765*** (12.82)	0.0701*** (18.71)	0.0699*** (18.69)
<i>Lev</i>	-0.0841*** (-3.99)	-0.0843*** (-4.00)	-0.8118*** (-19.76)	-0.8126*** (-19.78)	-5.2556*** (-10.21)	0.1086 (0.67)	-5.2493*** (-10.19)	0.1068 (0.66)	-0.0903*** (-3.97)	-0.0908*** (-4.00)
<i>Age</i>	0.0356*** (5.79)	0.0345*** (5.61)	-0.2150*** (-21.79)	-0.2155*** (-21.83)	-0.1917 (-1.55)	0.1942*** (5.94)	-0.1823 (-1.47)	0.1924*** (5.88)	-0.0179** (-2.43)	-0.0199*** (-2.70)

(Continues)

TABLE 4 (Continued)

Variables	Bloomberg ESG	BloombergESG	HZESG	HZESG	HXCSR	HXSCSR	HXCSR	HXSCSR	RCSR	RCSR
Phd	0.0672* (1.93)	0.0693** (1.99)	-0.0209 (-0.27)	-0.0197 (-0.25)	0.4192 (0.38)	-0.0981 (-0.34)	0.4933 (0.45)	-0.1002 (-0.35)	0.2805*** (6.94)	0.2781*** (6.89)
Gender	0.0312 (1.03)	0.0318 (1.05)	-0.1661*** (-2.66)	-0.1657*** (-2.65)	-0.5634 (-0.69)	1.9236*** (8.30)	-0.5813 (-0.72)	1.9259*** (8.31)	0.1266*** (3.52)	0.1289*** (3.59)
Salary	0.0272*** (5.43)	0.0273*** (5.46)	0.1170*** (10.44)	0.1173*** (10.47)	2.5527*** (16.24)	0.1399*** (3.22)	2.5560*** (16.26)	0.1403*** (3.23)	0.0533*** (9.58)	0.0533*** (9.57)
Control	0.0607*** (8.53)	0.0612*** (8.60)	0.2152*** (12.86)	0.2151*** (12.86)	1.1982*** (5.00)	0.1425*** (2.21)	1.2100*** (5.04)	0.1415*** (2.19)	0.0441*** (5.24)	0.0447*** (5.32)
Ind	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.8256*** (9.38)	0.8220*** (9.32)	-3.2595*** (-17.03)	-3.2655*** (-17.09)	-98.7445*** (-34.40)	-9.0785*** (-11.85)	-99.1457*** (-34.58)	-9.0650*** (-11.85)	0.6816*** (7.38)	0.6964*** (7.57)
N	7729	7729	22,364	22,364	22,961	22,961	22,961	22,961	5643	5643
Adjusted R <sup>2</sup>	0.2438	0.2439	0.2155	0.2155	0.3677	0.3080	0.3676	0.3080	0.3697	0.3712
F	58.2761	58.6492	141.7730	141.9298	264.9423	225.1421	264.7867	225.1195	83.4466	83.8896

Note: This table presents regressions results with alternative CSR measures. Variable definitions are included in Appendix A.

\*, \*\*, and \*\*\* indicate that there is a significance at the level of 10%, 5%, and 1%, respectively.



**TABLE 5** Heckman two-stage analysis.

First stage return		Second stage return		
Variables	Doi	Variables	CSR-Dum	CSR-sum
<i>Inddoi</i>	7.0887*** (6.14)	<i>Doi</i>	0.4267*** (4.08)	0.0488*** (3.66)
<i>BH</i>	0.3547*** (7.35)	<i>IMR</i>	−0.4901*** (−5.08)	−0.1079*** (−8.13)
<i>Phd</i>	0.3871* (1.91)	<i>Board</i>	0.3570*** (3.17)	0.0647*** (4.26)
<i>Gender</i>	−0.4049** (−2.31)	<i>Dual</i>	−0.0167 (−0.42)	0.0025 (0.45)
<i>Foreign</i>	1.4587*** (7.13)	<i>Indep</i>	1.3238*** (3.30)	0.2021*** (3.74)
<i>Size</i>	0.2440*** (12.93)	<i>Share1</i>	0.2587* (1.88)	0.0621*** (3.26)
<i>Board</i>	−0.1061 (−1.15)	<i>Inst</i>	−0.0158 (−0.06)	0.0414 (1.21)
<i>Dual</i>	−0.1184** (−2.52)	<i>Mshare</i>	1.3375*** (4.27)	0.2823*** (6.56)
<i>Indep</i>	0.4596 (1.39)	<i>Soe</i>	−0.8879*** (−6.02)	−0.1629*** (−8.00)
<i>q</i>	0.0965*** (7.37)	<i>Roa</i>	0.3456 (1.16)	0.1324*** (2.89)
<i>Roa</i>	−0.0468 (−0.14)	<i>Cash</i>	0.7461*** (3.04)	0.0786** (2.34)
<i>Mshare</i>	−3.1386*** (−7.72)	<i>Growth</i>	−0.2223*** (−6.85)	−0.0399*** (−8.92)
<i>Salary</i>	0.0386 (1.46)	<i>Taxrate</i>	8.7541*** (3.83)	0.6292** (1.97)
<i>Share1</i>	−0.5317*** (−4.79)	<i>Size</i>	0.6377*** (26.13)	0.1031*** (30.97)
<i>Cash</i>	0.1786 (0.77)	<i>Lev</i>	−0.8893*** (−8.45)	−0.1745*** (−11.80)
<i>Growth</i>	−0.0136 (−0.42)	<i>Age</i>	0.1839*** (7.49)	0.0319*** (9.20)
<i>Lev</i>	0.4864*** (4.81)	<i>Phd</i>	0.8070*** (3.44)	0.0200 (0.63)
<i>Salary</i>	0.0000 (.)	<i>Gender</i>	−0.6158*** (−3.75)	−0.0748*** (−3.27)
<i>Control</i>	0.2981*** (7.43)	<i>Salary</i>	0.2528*** (8.34)	0.0337*** (8.19)
		<i>Control</i>	0.1415*** (2.80)	0.0336*** (4.76)
<i>Ind</i>	Yes	<i>Ind</i>	Yes	Yes
<i>Year</i>	Yes	<i>Year</i>	Yes	Yes
<i>Constant</i>	−8.0632*** (−17.58)	<i>Constant</i>	−16.6307*** (−20.86)	−2.5516*** (−23.25)

(Continues)

TABLE 5 (Continued)

First stage return		Second stage return		
Variables	Doi	Variables	CSR-Dum	CSR-sum
N	26,215		26,215	26,215
Pseudo R <sup>2</sup>	0.2094	Adjusted R <sup>2</sup>	0.2040	0.2309
LR Chi <sup>2</sup>	1935.03	F	140.5285	181.8831

Note: This table presents results using Heckman two-stage analysis. Variable definitions are included in Appendix A.

\*, \*\*, and \*\*\* indicate that there is a significance at the level of 10%, 5%, and 1%, respectively.

### 4.3 | Underlying mechanisms of the relation between D&O liability insurance and CSR performance

Our findings so far have found that the adoption of D&O liability insurance leads to an increase in corporate social responsibility and the longer the adoption, the better the social responsibility. This article posits that D&O liability insurance promotes CSR by improving the transparency of information and the robustness of accounting in listed companies.

Results in Section 4.2 support our *supervision or insurer's monitoring and incentives hypotheses (hypothesis 1a)*, indicating a positive relation between D&O liability insurance and CSR performance. We further explore what underlying mechanisms driving this positive relation and test our hypothesis two as follows.

#### 4.3.1 | D&O liability insurance enhances corporate social responsibility by increasing information transparency

Accurate evaluation of a company's CSR by rating agencies and effective use of disclosed information by investors for investment decisions can only be achieved if a company has disclosed its ESG information. The Accounting Information Transparency Index (*Tran*) is constructed using the indicators of earnings progression (*EA*) and earnings smoothness (*ES*), following the approach of Bhattacharya and Korschun (2006) as follows:

$$Tran_{it} = \frac{Delices(EA_{it}) + Delices(ES_{it})}{2} \quad (3)$$

*Delices* represents the decile processing of the variables. By construct, the value of *Tran* has a range of [1, 10]. A higher value of *Tran* indicates lower transparency of accounting information for a listed company. We calculate *EA* and *ES* as follows:

$$EA_{it} = ACC_{it} / Assest_{it-1}, \quad (4)$$

$$\text{Among them } ACC_{it} = \Delta CA_{it} - \Delta CL_{it} - \Delta Cash_{it} + \Delta STD_{it} - DEP_{it} + \Delta TP_{it}, \quad (5)$$

$$ES_{it} = SD \left\{ CFO_{it-3} / Asset_{it-4}, CFO_{it-2} / Asset_{it-3}, \right. \\ \left. CFO_{it-1} / Asset_{it-2}, CFO_{it} / Asset_{it-1} \right\} / SD \left\{ NI_{it-3} / Asset_{it-4}, \right. \\ \left. NI_{it-2} / Asset_{it-3}, NI_{it-1} / Asset_{it-2}, NI_{it} / Asset_{it-1} \right\}, \quad (6)$$

where, *ACC* represents recordable items,  $\Delta$  represents change, *CA* represents current assets, *CL* represents current liabilities, *Cash* represents cash, *STD* represents long-term debt due within 1 year, *DEP* represents accumulated depreciation of fixed assets and amortization of intangible assets, *TP* represents taxes payable, *SD* represents standard deviation, *CFO* represents net cash flow from operating activities, *NI* represents net profit, and *Asset* represents total assets. Our regressions take the following forms.

$$Tran_{it} = \alpha_0 + \alpha_1 Doi_{it} + \alpha Controls_{it} + \sum Year + \sum Ind + \varepsilon_{it}, \quad (7)$$

$$CSR-Dum_{it} = \alpha_0 + \alpha_1 Doi_{it} + \alpha_2 Tran_{it} + \alpha Controls_{it} + \sum Year + \sum Ind + \varepsilon_{it}, \quad (8)$$

$$Tran_{it} = \alpha_0 + \alpha_1 Doitime_{it} + \alpha Controls_{it} + \sum Year + \sum Ind + \varepsilon_{it}, \quad (9)$$

$$CSR-Dum_{it} = \alpha_0 + \alpha_1 Doitime_{it} + \alpha_2 Tran_{it} + \alpha Controls_{it} \\ + \sum Year + \sum Ind + \varepsilon_{it}. \quad (10)$$

Table 9 presents the regression results, which indicate that D&O liability insurance can significantly enhance the information transparency of companies. Additionally, this increase in information transparency can also significantly boost corporate social responsibility. Columns (2) and (4) of Table 9 demonstrate that both D&O liability insurance and information transparency variables have a significant impact on corporate social responsibility, suggesting that the implementation of directors' and officers' liability insurance enhances information transparency, thereby fostering an environment conducive to increased CSR initiatives. This confirms our *information transparency hypothesis (hypothesis 2a)*.

**TABLE 6** DID method regression results.

Variables	(1) CSR-Dum	(2) CSR-sum
Policy	0.5407** (2.44)	0.0868*** (2.84)
Treat	−0.0695 (−0.34)	−0.0285 (−1.00)
Board	0.3157*** (2.98)	0.0556*** (3.81)
Dual	−0.0649 (−1.59)	−0.0081 (−1.45)
Indep	1.6179*** (4.33)	0.2674*** (5.20)
Share1	0.0233 (0.18)	0.0103 (0.59)
Inst	0.0926 (0.39)	0.0651** (1.97)
Mshare	−0.1483 (−1.18)	−0.0447*** (−2.58)
Soe	−0.9057*** (−6.63)	−0.1668*** (−8.86)
Roa	0.3043 (0.81)	0.1229** (2.37)
Cash	0.8548*** (3.39)	0.1024*** (2.95)
Growth	−0.2267*** (−6.45)	−0.0409*** (−8.44)
Taxrate	9.3499*** (4.01)	0.7602** (2.36)
Size	0.7185*** (35.57)	0.1209*** (43.43)
Lev	−0.6751*** (−6.45)	−0.1274*** (−8.82)
Age	0.2000*** (7.56)	0.0354*** (9.71)
Phd	1.2125*** (5.65)	0.1095*** (3.70)
Gender	−0.7689*** (−4.58)	−0.1084*** (−4.68)
Salary	0.2859*** (9.78)	0.0410*** (10.17)
Control	0.2568*** (5.76)	0.0590*** (9.61)
Ind	Yes	Yes
Year	Yes	Yes
Constant	−19.9568*** (−40.59)	−3.2860*** (−48.49)

(Continues)

**TABLE 6** (Continued)

Variables	(1) CSR-Dum	(2) CSR-sum
N	26,215	26,215
Adjusted R <sup>2</sup>	0.2032	0.2291
F	143.2733	166.7399

Note: This table presents results using DiD regression method. Variable definitions are included in Appendix A.

\*, \*\*, and \*\*\* indicate that there is a significance at the level of 10%, 5%, and 1%, respectively.

#### 4.3.2 | D&O liability insurance enhances corporate social responsibility by increasing accounting conservatism

A socially responsible company typically provides transparent information to the public and welcomes oversight. The more stable a company's accounting, the more cautious its management practices tend to be and the better protected the interests of its stakeholders. Basu (1997) is one of the first to quantify accounting conservatism through regression models. This is expanded by Khan and Watts (2009), which develop the C-Score model and calculates a company's annual accounting robustness index. Following Khan and Watts (2009), we measure accounting conservatism as follows:

$$EPS_{i,t}/P_{i,t-1} = \alpha_1 + \alpha_2 D_{i,t} + \alpha_3 R_{i,t} + \alpha_4 D_{i,t} \times R_{i,t} + e_{i,t}, \quad (11)$$

where,  $EPS_{i,t}$  is the earnings per share of company  $i$  at the end of year  $t$ ;  $P_{i,t-1}$  is the closing price of company  $i$  at the end of year  $t - 1$ ;  $R_{i,t}$  is the annual return on individual stocks of company  $i$  in year  $t$  considering cash dividend reinvestment;  $D_{i,t}$  is a binary variable, taking a value of 1 if  $R_{i,t}$  is negative and 0 otherwise. In Model 11,  $\alpha_3$  reflects the company's confirmation timeliness coefficient of good news, and  $\alpha_3 + \alpha_4$  reflects the company's response timeliness coefficient to bad news. Specifically,  $\alpha_4$  is used to measure accounting robustness. A significant and positive  $\alpha_4$  indicates that the listed company has accounting robustness practices.

To measure accounting conservatism, we estimate the following models:

$$G\text{-score} = a_3 = \beta_0 + \beta_1 Size_{i,t} + \beta_2 MB_{i,t} + \beta_3 Lev_{i,t}, \quad (12)$$

$$C\text{-score} = a_4 = \gamma_0 + \gamma_1 Size_{i,t} + \gamma_2 MB_{i,t} + \gamma_3 Lev_{i,t}, \quad (13)$$

where,  $Size_{i,t}$ ,  $MB_{i,t}$ , and  $Lev_{i,t}$  are company size, ratio of market value to book value, and asset-liability ratio, respectively. G-score in Model 12 represents the timeliness coefficient of confirmation of good news while C-score in Model 13 represents the timeliness coefficient of confirmation of bad news. Replacing  $\alpha_3$  and  $\alpha_4$  in Model 11 with Models 12 and 13 leads to Model 14, indicating accounting robustness index as follows:

TABLE 7 2SLS method regression.

Variables	(1) Doi	(2) CSR-sum
Doi		1.3125 (1.40)
Board	0.0068 (0.85)	0.3110*** (2.77)
Dual	−0.0016 (−0.69)	−0.0642* (−1.69)
Indep	0.1076*** (3.82)	1.5226*** (3.69)
Share1	−0.0051 (−0.52)	0.0272 (0.21)
Inst	−0.0429** (−2.16)	0.1274 (0.51)
Mshare	0.0327*** (8.21)	−0.1739 (−1.57)
Soe	−0.0200* (−1.65)	−0.8869*** (−5.92)
Roa	−0.0068 (−0.26)	0.3232 (1.08)
Cash	0.0029 (0.16)	0.8449*** (3.43)
Growth	−0.0065** (−2.50)	−0.2216*** (−6.70)
Taxrate	0.2603 (0.142)	9.1695*** (3.98)
Size	0.2520*** (13.19)	0.6963*** (22.06)
Lev	0.0159** (2.12)	−0.6849*** (−7.22)
Age	0.0233*** (14.24)	0.1817*** (5.68)
Phd	0.0860*** (4.75)	1.0930*** (4.26)
Gender	−0.0375*** (−3.38)	−0.7429*** (−4.53)
Salary	0.0017 (0.80)	0.2807*** (9.30)
Control	0.0257*** (7.38)	0.2386*** (4.86)
Inddoi	0.9181*** (5.79)	
East	0.0067** (2.41)	
Foreign	0.1892*** (10.27)	

(Continues)

TABLE 7 (Continued)

Variables	(1) Doi	(2) CSR-sum
Ind	Yes	Yes
Year	Yes	Yes
Constant	−0.6750*** (−15.14)	−19.3702*** (−23.64)
N	26,215	26,215
Adjusted R <sup>2</sup>	0.0826	0.2003
F/Wald Chi <sup>2</sup>	25.25	6535.06

Note: This table presents results using the 2SLS method. Variable definitions are included in Appendix A.

\*, \*\*, and \*\*\* indicate that there is a significance at the level of 10%, 5%, and 1%, respectively.

$$\begin{aligned}
 EPS_{i,t}/P_{i,t-1} = & a_1 + a_2 D_{i,t} + R_{i,t}(\beta_0 + \beta_1 Size_{i,t} + \beta_2 MB_{i,t} + \beta_3 Lev_{i,t}) \\
 & + D_{i,t} \times R_{i,t}(\gamma_0 + \gamma_1 Size_{i,t} + \gamma_2 MB_{i,t} + \gamma_3 Lev_{i,t}) \\
 & + (Size_{i,t} + MB_{i,t} + Lev_{i,t} + D_{i,t} \times Size_{i,t} + D_{i,t} \times MB_{i,t} + D_{i,t} \times Lev_{i,t}) + e_{i,t}.
 \end{aligned} \quad (14)$$

We then perform a regression using Model 14 to obtain coefficients for  $\gamma$ 's to calculate C-Score in Model 15. The larger the C-score value, the higher the accounting robustness. Next, we estimate the following regressions:

$$C-Score_{i,t} = \alpha_0 + \alpha_1 Doi_{i,t} + \alpha Controls_{i,t} + \sum Year + \sum Ind + \varepsilon_{i,t}, \quad (15)$$

$$\begin{aligned}
 CSR-Dum_{i,t} = & \alpha_0 + \alpha_1 Doi_{i,t} + \alpha_2 C-Score_{i,t} + \alpha Controls_{i,t} \\
 & + \sum Year + \sum Ind + \varepsilon_{i,t},
 \end{aligned} \quad (16)$$

$$C-Score_{i,t} = \alpha_0 + \alpha_1 Doitime_{i,t} + \alpha Controls_{i,t} + \sum Year + \sum Ind + \varepsilon_{i,t}, \quad (17)$$

$$\begin{aligned}
 CSR-Dum_{i,t} = & \alpha_0 + \alpha_1 Doitime_{i,t} + \alpha_2 C-Score_{i,t} \\
 & + \alpha Controls_{i,t} + \sum Year + \sum Ind + \varepsilon_{i,t}.
 \end{aligned} \quad (18)$$

Table 10 reports the regression results and indicates that D&O liability insurance can significantly enhance the accounting stability of listed companies. Additionally, the greater the accounting stability, the higher the level of corporate social responsibility. Columns (2) and (4) demonstrate that once D&O liability insurance variables and accounting robustness indicators are added simultaneously, both are positively correlated with corporate social responsibility. This suggests that D&O liability insurance affects CSR by partly impacting accounting conservatism. Overall, we find support for our *accounting conservatism hypothesis (hypothesis 2b)* such that the implementation of directors' and officers' liability insurance enhances accounting conservatism, thereby fostering an environment conducive to increased CSR.

**TABLE 8** Regression result of PSM method.

Variables	(1) CSR-Dum	(2) CSR-sum	(3) CSR-Dum	(4) CSR-sum
<i>Doi</i>	0.0405** (2.32)	0.2846** (2.12)		
<i>Doitime</i>			0.0150* (1.86)	0.1030* (1.66)
<i>Board</i>	0.0119 (0.24)	0.1962 (0.51)	0.0115 (0.23)	0.1932 (0.50)
<i>Dual</i>	−0.0281 (−0.98)	0.0052 (0.02)	−0.0277 (−0.97)	0.0078 (0.03)
<i>Indep</i>	−0.1320 (−0.76)	−1.4893 (−1.16)	−0.1380 (−0.80)	−1.5319 (−1.20)
<i>Share1</i>	−0.0283 (−0.42)	−0.2347 (−0.45)	−0.0282 (−0.42)	−0.2330 (−0.45)
<i>Inst</i>	0.2703** (2.31)	0.9518 (1.04)	0.2653** (2.27)	0.9169 (1.00)
<i>Mshare</i>	−0.7934** (−2.54)	−2.5833 (−1.25)	−0.7870** (−2.52)	−2.5389 (−1.22)
<i>Soe</i>	−0.1966*** (−3.24)	−1.4621*** (−3.26)	−0.1943*** (−3.19)	−1.4462*** (−3.22)
<i>Roa</i>	−0.2890 (−1.47)	−1.7749 (−1.30)	−0.2934 (−1.49)	−1.8055 (−1.32)
<i>Cash</i>	−0.2688** (−2.08)	−1.2335 (−1.23)	−0.2682** (−2.08)	−1.2293 (−1.23)
<i>Growth</i>	−0.0440** (−2.34)	−0.2972** (−2.16)	−0.0438** (−2.32)	−0.2961** (−2.15)
<i>Taxrate</i>	0.0824 (0.07)	−3.4538 (−0.39)	0.0692 (0.06)	−3.5560 (−0.40)
<i>Size</i>	0.1583*** (18.74)	1.0386*** (15.96)	0.1583*** (18.69)	1.0385*** (15.91)
<i>Lev</i>	−0.3261*** (−5.54)	−2.4263*** (−5.51)	−0.3266*** (−5.54)	−2.4299*** (−5.51)
<i>Age</i>	0.0027 (0.11)	0.2402 (1.31)	−0.0014 (−0.06)	0.2122 (1.15)
<i>Phd</i>	0.2659*** (2.63)	2.8445*** (3.73)	0.2670*** (2.65)	2.8514*** (3.74)
<i>Gender</i>	−0.1892* (−1.81)	−1.0635 (−1.36)	−0.1868* (−1.79)	−1.0451 (−1.34)
<i>Salary</i>	0.0402*** (2.75)	0.3278*** (2.98)	0.0417*** (2.86)	0.3386*** (3.09)
<i>Control</i>	0.0334 (1.38)	0.2043 (1.09)	0.0337 (1.39)	0.2068 (1.10)
<i>Ind</i>	Yes	Yes	Yes	Yes
<i>Year</i>	Yes	Yes	Yes	Yes
<i>Constant</i>	−3.7721*** (−16.90)	−25.6158*** (−14.72)	−3.7751*** (−16.92)	−25.6389*** (−14.73)
<i>N</i>	2240	2240	2240	2240

(Continues)





TABLE 8 (Continued)

Variables	(1) CSR-Dum	(2) CSR-sum	(3) CSR-Dum	(4) CSR-sum
Adjusted R <sup>2</sup>	0.3319	0.3311	0.3313	0.3305
F	46.4075	41.5270	46.2662	41.3617

Note: This table presents results using the PSM method. Variable definitions are included in Appendix A.

\*, \*\*, and \*\*\* indicate that there is a significance at the level of 10%, 5%, and 1%, respectively.

TABLE 9 D&amp;O liability insurance, information transparency, and corporate social responsibility.

Variables	(1) Tran	(3) CSR-Dum	(4) Tran	(5) CSR-Dum
Doi	−0.4199*** (−6.74)	0.0512*** (3.65)		
Tran		−0.0035*** (−3.01)		−0.0035*** (−3.01)
Doitime			−0.2047*** (−7.17)	0.0226*** (3.46)
Board	−0.1840** (−2.02)	0.0676*** (3.97)	−0.1837** (−2.01)	0.0675*** (3.97)
Dual	0.0659* (1.70)	−0.0075 (−1.21)	0.0656* (1.69)	−0.0075 (−1.21)
Indep	−0.2183 (−0.67)	0.2997*** (5.05)	−0.2132 (−0.65)	0.2996*** (5.05)
Share1	−0.2697** (−2.41)	0.0202 (1.00)	−0.2675** (−2.39)	0.0199 (0.99)
Inst	1.7398*** (8.16)	0.0548 (1.46)	1.7458*** (8.19)	0.0538 (1.43)
Mshare	−0.7340*** (−5.25)	−0.0598*** (−3.19)	−0.7314*** (−5.23)	−0.0599*** (−3.20)
Soe	−1.2785*** (−10.93)	−0.1776*** (−7.64)	−1.2828*** (−10.97)	−0.1772*** (−7.63)
Roa	3.2102*** (8.08)	0.1449** (2.51)	3.2171*** (8.10)	0.1439** (2.49)
Cash	−4.9756*** (−20.92)	0.1318*** (3.31)	−4.9747*** (−20.92)	0.1319*** (3.31)
Growth	−0.0330 (−1.05)	−0.0447*** (−8.66)	−0.0328 (−1.04)	−0.0447*** (−8.67)
Taxrate	4.3159** (1.99)	0.6113 (1.63)	4.3154** (1.99)	0.6116 (1.63)
Size	0.1374*** (7.57)	0.1296*** (41.17)	0.1368*** (7.55)	0.1298*** (41.30)
Lev	−0.6306*** (−6.33)	−0.1443*** (−8.88)	−0.6284*** (−6.30)	−0.1446*** (−8.89)
Age	1.8146*** (58.94)	0.0507*** (9.34)	1.8176*** (58.99)	0.0505*** (9.29)
Phd	0.5008*** (2.64)	0.1339*** (3.95)	0.4988*** (2.63)	0.1349*** (3.98)

TABLE 9 (Continued)

Variables	(1) <i>Tran</i>	(3) <i>CSR-Dum</i>	(4) <i>Tran</i>	(5) <i>CSR-Dum</i>
Gender	0.3346** (2.19)	−0.0865*** (−3.33)	0.3327** (2.18)	−0.0865*** (−3.33)
Salary	−0.0206 (−0.80)	0.0462*** (10.06)	−0.0218 (−0.84)	0.0464*** (10.10)
Control	0.0506 (1.33)	0.0609*** (8.61)	0.0506 (1.33)	0.0609*** (8.62)
Ind	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Constant	−0.7554* (−1.77)	−3.6117*** (−47.17)	−0.7392* (−1.74)	−3.6173*** (−47.29)
N	21,645	21,645	21,645	21,645
Adjusted R <sup>2</sup>	0.3171	0.2345	0.3172	0.2345
F	224.2188	168.1913	224.2361	168.1333

Note: This table presents results on information transparency mechanism. Variable definitions are included in Appendix A.

\*, \*\*, and \*\*\* indicate that there is a significance at the level of 10%, 5%, and 1%, respectively.

## 5 | CONCLUSION

While corporate governance practices in China have been perceived to be relatively poorer than those in developed markets, the Chinese regulators have made significant efforts to improve corporate governance standards in recent years to be in line with international standards. However, it is essential to note that the Chinese A-share market still faces challenges in terms of corporate governance, including the influence of state ownership, potential conflicts of interest, uneven enforcement of regulations, and cultural factors impacting governance practices. With the fast growing of economic development, China is now ranked number two in the world in terms of market capitalization. As such, Chinese listed companies could influence the world's sustainable development. Given the significance of Chinese stock market, this article utilizes A-share data of Chinese listed companies from 2008 to 2018, and empirically explore the effect of D&O liability insurance on CSR and the underlying mechanism driving relation between these two aspects. We find that the implementation of D&O liability insurance can significantly boost companies' willingness to fulfill social responsibilities and also significantly enhances the level of CSR of listed companies. As the implementation time of D&O liability insurance increases, their willingness and level to fulfill social responsibilities will also increase. We also document the underlying mechanisms of a positive relation between D&O liability insurance and CSR performance are information transparency and accounting conservatism. D&O liability insurance improves information transparency and accounting conservatism and leading to better CSR performance. Our findings remain valid even after various robustness tests and endogenous treatments.

Our study adds to existing literature by providing the following insights. First, D&O liability insurance is an effective governance

mechanism that positively impacts CSR through supervision and incentive effects, and significantly improves companies' willingness and level of fulfilling social responsibilities. Second, the governance function of D&O liability insurance improves over time as companies gain more experience with it, as the introduction of D&O liability insurance extends over time, its governance functions will become more effective. Given that Chinese listed companies do not currently place great emphasis on this mechanism, regulators, insurance companies, scholars, and enterprises should actively and thoroughly explore this mechanism to provide a favorable environment for companies to perform their active functions and use this mechanism to enhance the external governance of Chinese listed companies.

Practical implications for our findings have several folds. We note that the interplay between D&O insurance and CSR can be an important business strategy for several reasons, including risk mitigation, reputation management, attracting investors and customers, and enhanced decision-making process. Companies may use D&O insurance as a business strategy to attract talents to leadership roles and enhance the stability of the company's leadership as D&O insurance mitigates risks associated with personal liability for directors and officers. Additionally, D&O insurance can further enhance stakeholder confidence in the company's commitment to ethical, sustainable, and socially responsible business practices. Our findings imply that by taking on D&O insurance, the company is willing to address any legal challenges that may arise while maintaining its focus on ethical practices. By aligning D&O insurance with CSR initiatives, companies can signal a commitment to accountability and good governance to investors and customers. Finally, D&O insurance empowers directors and officers to make socially and environmentally responsible decisions without worrying of personal financial consequences and eventually

**TABLE 10** D&O liability insurance, accounting conservatism, and corporate social responsibility.

Variables	(1) C-score	(3) CSR-Dum	(4) C-score	(5) CSR-Dum
<i>Doi</i>	0.0018*** (4.58)	0.0445*** (3.31)		
<i>C-score</i>		1.5390*** (8.68)		1.5420*** (8.70)
<i>Doitime</i>			0.0007*** (3.96)	0.0194*** (3.10)
<i>Board</i>	0.0026*** (4.18)	0.0448*** (2.62)	0.0026*** (4.17)	0.0447*** (2.61)
<i>Dual</i>	0.0005* (1.69)	−0.0088 (−1.35)	0.0005* (1.69)	−0.0088 (−1.35)
<i>Indep</i>	0.0156*** (6.99)	0.2700*** (4.45)	0.0157*** (6.99)	0.2698*** (4.44)
<i>Share1</i>	0.0015** (2.06)	0.0100 (0.47)	0.0015** (2.04)	0.0098 (0.46)
<i>Inst</i>	0.0143*** (10.58)	0.0676* (1.77)	0.0142*** (10.55)	0.0666* (1.74)
<i>Mshare</i>	−0.0023** (−1.98)	−0.0687*** (−3.03)	−0.0023** (−1.98)	−0.0688*** (−3.04)
<i>Soe</i>	−0.0016** (−2.43)	−0.1901*** (−8.38)	−0.0016** (−2.41)	−0.1897*** (−8.36)
<i>Roa</i>	0.0028 (0.81)	0.0610 (1.25)	0.0028 (0.80)	0.0601 (1.23)
<i>Cash</i>	−0.0029* (−1.77)	0.1277*** (3.35)	−0.0029* (−1.76)	0.1278*** (3.35)
<i>Growth</i>	0.0006*** (2.60)	−0.0393*** (−8.01)	0.0006*** (2.59)	−0.0393*** (−8.01)
<i>Taxrate</i>	0.0953*** (5.22)	0.7589** (2.13)	0.0954*** (5.23)	0.7591** (2.13)
<i>Size</i>	0.0030*** (21.66)	0.1186*** (38.73)	0.0030*** (21.78)	0.1188*** (38.85)
<i>Lev</i>	0.0733*** (99.91)	−0.2527*** (−12.70)	0.0733*** (99.87)	−0.2532*** (−12.72)
<i>Age</i>	0.0100*** (39.19)	0.0141* (2.47)	0.0100*** (39.17)	0.0140* (2.44)
<i>Phd</i>	0.0117*** (8.49)	0.1248*** (3.48)	0.0118*** (8.54)	0.1260*** (3.51)
<i>Gender</i>	−0.0024** (−2.13)	−0.0966*** (−3.65)	−0.0024** (−2.14)	−0.0966*** (−3.65)
<i>Salary</i>	−0.0001 (−0.40)	0.0447*** (9.87)	−0.0001 (−0.37)	0.0449*** (9.91)
<i>Control</i>	−0.0003 (−1.41)	0.0629*** (8.89)	−0.0003 (−1.40)	0.0629*** (8.89)
<i>Ind</i>	Yes	Yes	Yes	Yes
<i>Year</i>	Yes	Yes	Yes	Yes
<i>Constant</i>	−0.0624***	−3.2991***	−0.0627***	−3.3043***

TABLE 10 (Continued)

Variables	(1) C-score (−20.09)	(3) CSR-Dum (−43.13)	(4) C-score (−20.24)	(5) CSR-Dum (−43.24)
N	21,045	21,045	21,045	21,045
Adjusted R <sup>2</sup>	0.7365	0.2283	0.7364	0.2282
F	1.4e+03	165.7734	1.4e+03	165.6079

Note: This table presents results on accounting conservatism mechanism. Variable definitions are included in Appendix A.

\*, \*\*, and \*\*\* indicate that there is a significance at the level of 10%, 5%, and 1%, respectively.

leads to a more proactive approach to CSR and sustainable development.

The implications of this study are particularly relevant for developing countries seeking to enhance their corporate governance structures and CSR practices. First, as the largest emerging economy, China's experience with adopting market-oriented governance mechanisms, including D&O liability insurance, offers valuable insights for other nations. Second, while D&O liability insurance is a common practice in some developed countries, it is still in its early stages in many emerging economies. Our study suggests that D&O liability insurance, as a market-oriented governance tool, is likely to become a crucial element of corporate governance in these contexts.

We note the limitations of our study as follows. The information related to D&O liability insurance is not included in the mandatory information disclosure requirements for Chinese listed companies. As such, data on D&O liability insurance premiums and liability limits is unavailable, which limits the investigation of the marginal effect of D&O liability insurance's governance functions. These limitations may be addressed as information disclosure by listed companies improves. When more detailed disclosure is available, future researchers can thoroughly revisit our idea and untangle the mechanisms of interplay between D&O liability insurance and CSR.

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## REFERENCES

- Aguiar, I., Burns, N., Sattar, A., Mansi, W., & John, K. (2014). Liability protection, director compensation, and incentives. *Journal of Financial Intermediation*, 23(4), 570–589.
- Attig, N., Ghoul, E. S., Guedhami, O., & Suh, J. (2013). Corporate social responsibility and credit ratings. *Journal of Business Ethics*, 117(4), 679–694.
- Baker, T., & Griffith, S. J. (2007). Predicting corporate governance risk: Evidence from the directors' and officers' liability insurance market. *Chicago Law Review*, 74, 1–58.
- Basu, S. (1997). The conservatism principle and the asymmetric timeliness of earnings. *Journal of Accounting and Economics*, 24(1), 3–37.
- Berthelot, S., Coulmout, M., & Serret, V. (2012). Do Investors value sustainability reports? A Canadian study. *Corporate Social Responsibility and Environmental Management*, 19, 355–363.
- Bhattacharya, S., & Korschun, C. B. (2006). The role of corporate social responsibility in strengthening multiple stakeholder relationships. *Journal of the Academy of Marketing Science*, 34(2), 158–166.
- Bolton, P., Scheinkman, J., & Wei, X. (2006). Executive compensation and short termist behavior in speculative markets. *Review of Economic Studies*, 73(3), 577–610.
- Boubakri, N., & Bouslimi, L. (2016). Directors' and officers' liability insurance and analyst forecast properties. *Finance Research Letters*, 10, 1–11.
- Boyer, M. M., & Tennyson, S. (2015). Directors' and officers' liability insurance, corporate risk and risk taking: New panel data evidence on the role of directors' and officers' liability insurance. *The Journal of Risk and Insurance*, 82(4), 753–791.
- Carroll, A. B. (1999). Corporate social responsibility evolution of a definitional construct. *Business & Society*, 38(2), 268–295.
- Chen, T., Dong, H., & Lin, C. (2020). Institutional shareholders and corporate social responsibility. *Journal of Financial Economics*, 135(2), 483–504.
- Chen, Z., Li, O. Z., & Zou, H. (2016). Directors' and officers' liability insurance and the cost of equity. *Journal of Accounting and Economics*, 61(1), 100–120.
- Chung, H. H., & Wynn, J. P. (2014). Corporate governance, directors' and officers' insurance premiums and audit fees. *Managerial Auditing Journal*, 29(2), 173–195.
- Cook, A., & Glass, C. (2018). Women on corporate boards: Do they advance corporate social responsibility. *Human Relations*, 71(7), 897–924.
- Core, J. E. (1997). On the corporate demand for directors' and officers' insurance. *Journal of Risk and Insurance*, 64, 63–87.
- Core, J. E. (2000). The directors' and officers' insurance premium: An outside assessment of the quality of corporate governance. *Journal of Law, Economics and Organization*, 16(2), 449–477.
- Cronqvist, H., & Yu, F. (2017). Shaped by their daughters: Executives, female socialization, and corporate social responsibility. *Journal of Financial Economics*, 126(3), 543–562.
- Donaldson, T., & Dunfee, T. W. (1994). Toward a unified conception of business ethics: Integrative social contracts theory. *Academy of Management Review*, 19, 252–284.
- Donley, S., & Kent, N. (2013). *Directors and officers liability in Canada: A review of exposures and coverages available under D&O policies*. Clark Wilson LLP. <http://www.cwilson.com>
- Drobetz, W., Merikas, A., Merika, A., & Tsionas, M. G. (2014). Corporate social responsibility disclosure: The case of international shipping. *Transportation Research Part E-Logistics and Transportation Review*, 71, 18–44.



- Dyck, A., Lins, V. K., Roth, L., & Wagner, F. H. (2019). Do institutional investors drive corporate social responsibility? International evidence. *Journal of Financial Economics*, 131(3), 693–714.
- Giannarakis, G., Konteos, G., Zafeiriou, E., & Partalidou, X. (2016). The impact of corporate social responsibility on financial performance. *Investment Management and Financial Innovations*, 13(3–1), 171–182.
- Giuli, D. A., & Kostovetsky, L. (2014). Are red or blue companies more likely to go green? Politics and corporate social responsibility. *Journal of Financial Economics*, 111(1), 158–180.
- Hemingway, C. A., & MacLagan, P. W. (2004). Managers, personal values drivers of corporate social responsibility. *Journal of Business Ethics*, 50(1), 33–44.
- Holderness, C. G. (1990). Liability insurers as corporate monitors. *International Review of Law and Economics*, 10(2), 115–129.
- Hu, G. L., & Wan, Q. (2015). Can directors liability insurance restrain stock price crash risk—empirical evidence from Chinese listed companies. *The Theory and Practice of Finance and Economics*, 36(6), 38–43.
- Hwang, J. H., & Kim, B. (2018). Directors' and officers' liability insurance and firm value. *Journal of Risk and Insurance*, 85, 447–482. <https://doi.org/10.1111/jori.12136>
- Jensen, M., & Meckling, W. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305–360.
- Jia, N., & Tang, X. (2018). Directors' and officers' liability insurance, independent director behavior and governance effect. *Journal of Risk and Insurance*, 85(4), 1013–1054.
- Jiao, Y. (2010). Stakeholder welfare and firm value. *Journal of Banking and Finance*, 34(10), 2549–2561.
- Jizi, M. I., Salama, A., Dixon, R., & Stratling, R. (2014). Corporate governance and corporate social responsibility disclosure: Evidence from the US banking sector. *Journal of Business Ethics*, 125(4), 601–615.
- Khan, M., & Watts, R. L. (2009). Estimation and empirical properties of a firm-year measure of accounting conservatism. *Journal of Accounting and Economics*, 48(2), 132–150.
- Kim, I. (2006). *Directors' and officers' insurance and opportunism in accounting choice*. George Washington University, Working paper.
- Lei, X., Tang, X. S., & Jiang, X. (2020). Can directors' and officers' liability insurance suppress corporate violations? *Research on Economics and Management*, 41(2), 127–144. <https://doi.org/10.13502/j.cnki.issn1000-7636.2020.02.009>
- Li, K. F., & Liao, Y. P. (2017). The effect of directors' and officers' insurance on audit fees: The case of an emerging economy. *Asian Review of Accounting*, 25(2), 174–190.
- Liao, H. M., Tang, L. F., & Lee, J. Z. (2016). Directors' and officers' liability insurance and earnings conservatism. *Journal of Accounting Review*, 63, 109–150.
- Lin, C., Officer, M. S., Wang, R., & Zou, H. (2013). Directors' and officers' liability insurance and loan spreads. *Journal of Financial Economics*, 110(1), 37–60.
- Ling, S. X., & Bai, R. F. (2017). The corporate governance function of directors' and officers' liability insurance—based on the aspect of the two kinds agency costs. *Finance & Trade Economics*, 38(12), 95–110.
- Liou, C., Liu, J., Jian, P., & Tsai, C. (2016). Effects of director and officer liability insurance coverage on information disclosure quality and corporate fraud. *Emerging Markets Finance and Trade*, 3, 1–13.
- Maon, F., Lindgreen, A., & Swaen, V. (2010). Organizational stages and cultural phases: A critical review and a consolidative model of corporate social responsibility development. *International Journal of Management Reviews*, 12(1), 20–38. <https://doi.org/10.1111/j.1468-2370.2009.00278.x>
- Mayers, D., & Smith, J. C. W. (1982). On the corporate demand for insurance. *The Journal of Business*, 55, 281–296.
- Nazari, J. A., Hrazdil, K., & Mahmoudian, F. (2017). Assessing social and environmental performance through narrative complexity in CSR reports. *Journal of Contemporary Accounting and Economics*, 13(2), 166–178.
- O'sullivan, N. (1997). Insuring the agents: The role of directors' and officers' insurance in corporate governance. *The Journal of Risk and Insurance*, 64(3), 545–556.
- O'Sullivan, N. (2009). The impact of directors' and officers' insurance on audit pricing: Evidence from UK companies. *Accounting Forum*, 33(2), 146–161.
- Owusu-Ansah, S. (1998). The impact of corporate attributes on the extent of mandatory disclosure and reporting by listed companies in Zimbabwe. *The International Journal of Accounting*, 33(5), 605–631.
- Parsons, C. (2003). Moral Hazard in liability insurance. *Geneva Papers on Risk and Insurance Issues and Practice*, 28, 448–471.
- Porter, M. E., & Kramer, M. R. (2006). Strategy and society: The link between competitive advantage and corporate social responsibility. *Harvard Business Review*, 84(5), 138–139.
- Priest, G. L. (1987). The current insurance crisis and modern tort law. *The Yale Law Journal*, 96(7), 1521–1590.
- Romano, R. (1991). The shareholder suit: Litigation without foundation. *Journal of Law, Economics, and Organization*, 7, 55–87.
- Sen, S., & Bhattacharya, C. B. (2001). Does doing good always lead to doing better? Consumer reactions to corporate social responsibility. *Journal of Marketing Research*, 38(2), 225–243.
- Tang, Y., Mack, D., & Chen, G. (2018). The differential effects of CEO narcissism and hubris on corporate social responsibility. *Strategic Management Journal*, 39(5), 1370–1387.
- Tang, Y., Qian, C., & Shen, R. (2015). How CEO hubris affects corporate social (ir)responsibility. *Strategic Management Journal*, 36, 1338–1357.
- Vukic, N., Omazic, M., & Aleksic, A. (2018). Exploring the link between corporate stakeholder orientation and quality of corporate social responsibility reporting. *Interdisciplinary Description of Complex Systems*, 16(2), 275–288.
- Wan, P., Chen, X. Y., & Ke, Y. (2020). Does corporate integrity culture matter to corporate social responsibility? Evidence from China. *Journal of Cleaner Production*, 259, 120877. <https://doi.org/10.1016/j.jclepro.2020.120877>
- Wang, J. L., Zhang, J., Huang, H. Y., & Zhang, F. (2020). Directors' and officers' liability insurance and firm innovation. *Economic Modelling*, 89, 414–426.
- Wang, S. H. (2016). A study of the influence of management background characteristics on corporate social responsibility — empirical evidence from Chinese A-share listed companies. *Accounting Research*, 11(1), 53–60.
- Yang, C. F. (2009). Empirical study on the influential factors of social responsibility of Chinese enterprises. *Economist*, 1, 66–76.
- Yoon, Y., Gürhan-Canli, Z., & Schwarz, N. (2006). The effect of corporate social responsibility (CSR) activities on companies with bad reputations. *Journal of Consumer Psychology*, 16(4), 377–390.
- YörüK, B. K., & Zaim, O. (2008). International regulations and environmental performance. *Applied Economics*, 40(7), 807–822.
- Yuan, R. L., Sun, J., & Cao, F. (2016). Directors' and officers' liability insurance and stock price crash risk. *Journal of Corporate Finance*, 37, 173–192.

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## APPENDIX A: VARIABLE DEFINITIONS

Variable name	Variable symbol	Variable definitions
Willingness to corporate social responsibility	<i>CSR-Dum</i>	Dummy variable: The social responsibility report released in the current year for 1, otherwise for 0
Level of social corporate responsibility	<i>CSR-sum</i>	Number of social responsibility projects released in the annual report
Whether to purchase D&O insurance	<i>Doi</i>	Dummy variable: D&O insurance purchased for 1, otherwise for 0
The length of time the D&O insurance is introduced	<i>Doitime</i>	Natural logarithm of the number of years of D&O insurance introduced plus 1
Board size	<i>Board</i>	Natural logarithm of board members
Board independence	<i>Indep</i>	Proportion of independent directors in the board of directors
Leadership structure	<i>Dual</i>	Dummy variable: The chairman and CEO are one person for 1, otherwise for 0
The largest shareholder	<i>Share1</i>	Proportion of the largest shareholder
Institutional holdings	<i>Inst</i>	Sum of institutional shareholding ratio
Management holdings	<i>Mshare</i>	Sum of management's shareholding ratio
State owned holdings	<i>Soe</i>	Sum of state-owned shareholding ratio
Profitability	<i>Roa</i>	Proportion of net profit to total assets
Free cash flow	<i>Cash</i>	Proportion of net cash flow from operating activities to total assets
Operating income growth rate	<i>Growth</i>	Annual growth rate of operating income
Effective tax rate	<i>Taxrate</i>	Proportion of income tax expense to total profit
Total assets	<i>Size</i>	Natural logarithm of total assets
Assets and liabilities	<i>Lev</i>	Proportion of total liabilities to total assets
Listed market age	<i>Age</i>	Natural logarithm of number of years on the stock market plus 1
Educational level	<i>Phd</i>	Proportion of doctoral degree in senior management
Gender	<i>Gender</i>	Proportion of women in senior management
Executive compensation	<i>Salary</i>	Natural logarithm of executive compensation
Nature of property rights	<i>Control</i>	Dummy variable: 1 for a state-owned enterprise, 0 for everything else
Years	<i>Year</i>	Annual dummy variable
Industry	<i>Ind</i>	Industry dummy variables: Subject to the 2012 China Securities Regulatory Commission industry classification

Note: This table presents variable definitions for our main dependent and explanatory variables.



## APPENDIX B: SUMMARY OF MAIN STUDIES ON D&O INSURANCE

Effects of D&O	Theories	Sample	Sources
Positive	Supervision, monitoring	UK	O'sullivan (1997)
Positive	Supervision effect	Canada	Donley and Kent (2013)
Positive	Supervision effect	China	Hu and Wan (2015)
Positive	Monitoring management staff	China	Yuan et al. (2016)
Positive	Incentive	Korea	Hwang and Kim (2018)
Positive	Enhances managers' tolerance for failure, promoting R&D	China	Wang et al. (2020)
Negative	Higher loan spread	Canada	Lin et al. (2013)
Negative	Moral hazard	Taiwan	Li and Liao (2017)
Negative	Opportunism, higher audit fees	Canada	Chung and Wynn (2014)
Negative	Risk-taking behavior	Canada	Boyer and Tennyson (2015)
Negative	Opportunism, higher agency cost	Canada	Boubakri and Bouslimi (2016)
Negative	Higher cost of equity	Canada	Chen et al. (2016)
Negative	Opportunism, higher audit fees	Taiwan	Li and Liao (2017)
Negative	Opportunism, less responsible	China	Jia and Tang (2018)

Note: This table presents a summary of main studies on D&O insurance. It includes the effects of D&O, relevant theories and samples used.