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The effect of directors' and officers' liabilities insurance on corporate social responsibility evidence from China

Qingbin Meng [a], Song Wang [b,*], Ziya Zhong [a]

[a] School of Business, Renmin University of China, Beijing 100872, China
[b] Norris Vincent College of Business, Angelo State University, TX, United States of America

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ABSTRACT

Using the sample of Chinese publicly listed companies from 2008 to 2018, we find that the firms whose managers are covered by Directors' and Officers' Liabilities Insurance (D&O insurance) are more likely to have better performance in their corporate social responsibility (CSR) activities. The effect of D&O insurance on CSR is more pronounced when the surrounding insurance industry is more active, when the corporate governance is weaker, and when the external monitoring is less sufficient. Moreover, when D&O insurance is at presence, CSR activities can affect the firm's operating performance more effectively and positively. Overall, our results suggest that D&O insurance can be positively aligned with the shareholders' interests in promoting CSR.

1. Introduction

Corporate Social Responsibility (CSR) encompasses a company's voluntary commitment to contribute to economic, social, and environmental well-being beyond its immediate financial interests. While CSR initiatives are expected to benefit shareholders, the success of a CSR strategy largely hinges on the quality of a firm's corporate governance (Chan, Watson, & Woodliff, 2014; Hong, Li, & Minor, 2016). In this paper, we explore a novel factor that could influence a company's CSR activities: Directors' and Officers' Liability Insurance (D&O insurance). This insurance provides financial protection to managers in the event they are sued for wrongful acts. Given that many lawsuits against managers stem from failures and inadequacies in fulfilling CSR obligations, we argue that D&O insurance, as a governance mechanism to deter managerial wrongdoing, can significantly impact managers' pursuit of CSR activities.

D&O insurance providers are driven to oversee managers' alignment with CSR initiatives, necessitating compliance with legal and regulatory standards. This fosters a proactive commitment to CSR, aligns with ethical principles, bolsters responsible corporate governance, and provides leaders with incentives to act responsibly, thereby enhancing CSR practices and transparency in reporting. Therefore, we develop our main hypothesis named *Governance Hypothesis*, which predicts a positive relationship between the presence of D&O insurance and CSR success, as a result of effective insurance governance on the managers. This hypothesis is consistent with many studies that support the monitoring incentives of D&O insurance (Holderness, 1990; Jia, Mao, & Yuan, 2019; Yuan, Sun, & Cao, 2016; Zou, Wong, Shum, Xiong, & Yan, 2008).

We perform our tests by using the universe of Chinese publicly traded companies.[1] The Chinese regulator stipulates that the purchase of D&O insurance must be approved by the shareholders at their annual meetings and not solely by the management. Typically, the controlling shareholders, who are going to be covered by the insurance, are exempt from the voting, so the decision lies with the remaining shareholders. In some cases, the minority shareholders have even collectively vetoed the purchase of the insurance.[2] Therefore, in the Chinese context, shareholders can expect their interests to be more aligned with the insurance than with the managers.

* Corresponding author.
E-mail addresses: mengqingbin@rmbs.ruc.edu.cn (Q. Meng), song.wang@angelo.edu (S. Wang).

[1] It is interesting to explore the Chinese market because it is the second largest economy and financial market in the world while the development of its environmental protections and stakeholder awareness is relatively backward. According to Environmental Performance Index (EPI) report in 2020, China was only ranked 120th out of 180 countries (Wendling, Emerson, Esty, Levy, & de Sherbinin, 2020).

[2] For instances, at the shareholders' general meeting of Beijing Shuzhi Technology Co on May 20, 2022, the managers proposed the purchase of liability insurance for directors and executives, but the minority shareholders voted against it, resulting in the proposal's failure. Similarly, at its shareholder meeting on June 20, 2022, Pinlive Foods Co., Ltd. proposed the purchase of liability insurance, but the controlling shareholders, who were also the managers to be covered by the insurance, recused themselves from voting. The remaining minority shareholders voted against the proposal, leading to its rejection.

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Our empirical analysis indicates a strong positive relationship between the presence of D&O insurance and the performance of CSR measured in various dimensions such as level of CSR performance, ESG ranking, and the degree of CSR fulfillment. For example, the insurance can promote CSR performance score by 9 points, when the average is 39 points. This result remains statistically significant after controlling for the firms' financial characteristics such as firm size, leverage ratio, Tobin's Q, stock returns, as well as the firms' governance factors. Moreover, the impact of D&O insurance is more powerful when the insurance industry surrounding the firm headquarter is more active and when more of the firm's shares are held by insurance companies.

To support the notion that D&O insurance takes effect through improving governance, we show that the positive effect of D&O insurance on CSR is stronger at the presence of weak governance, indicated by CEO duality, fewer outside board directors, higher managerial expense ratios, and higher fees paid to auditors. We also find that the insurance effect is stronger when the institutional ownership is lower and when the local legal environment is less healthy. In contrast, the D&O insurance effect is stronger when the firm is not cross listed overseas and subject to less scrutiny by regulators, both of which signal weak governance.

D&O insurance also has a stronger effect on promoting CSR when managers are under mandatory disclosure or negative media scrutiny. These managers face reputation challenges, so they may treat CSR activities as a tool to restore their reputations. Thus, their CSR activities may not necessarily be driven by genuine motivation so the CSR outcomes may not be ideal. When such problems exist, the governing role of D&O insurance appears to be more effective.

Moreover, it is also possible that D&O insurance encourages managers to take more risks pursuing CSR, since the insurance provides a financial shield for the risk-seeking managers. However, we do not find evidence supporting this notion. Furthermore, we find that D&O insurance has a positive moderating effect on the connection between CSR performance and operating performance. When D&O insurance provides effective governance to promotes CSR, the effect of CSR on operating profits is more pronounced, which aligns with the interests of shareholders. Overall, D&O insurance can be seen as a useful facilitator for CSR.

Our study is the first to connect D&O insurance and CSR performance. We show that D&O insurance can promote a company's CSR performance through better governance. We add this new determinant of CSR performance to the literature, in addition to a variety of financial factors and governance factors. While CSR is important for the sustainability of our society, incorporating D&O insurance can better monitor the managers and motivate them to pursue CSR. We also add evidence to the debate over the role of D&O insurance. While some studies stress the moral hazard induced by the insurance policy, some other studies support the positive governance role of the insurance on managerial behaviors. Our findings are consistent with the latter.

The rest of this paper is organized as the following: Section 2 reviews the literature and develops our hypotheses. Section 3 introduces the data and major variables. Section 4 shows our empirical results. Section 5 presents the result of robustness check. Section 6 concludes.

2. Literature review and hypothesis development

Corporate Social Responsibilities (CSR) has gained large attention over the past decades. CSR initiatives not only earn the companies a reputation of good citizens in the society (Kim, 2019; Saxton, Gómez, Ngoh, Lin, & Dietrich, 2019; Zhang, Shan, & Chang, 2021), but also help the companies in various ways such as promotion of consumer goodwill (Tian, Wang, & Yang, 2011), lower cost of capital (Attig, El Ghoul, Guedhami, & Suh, 2013; Gong, Huang, Wu, Tian, & Li, 2021; Ye & Zhang, 2011), better operating performance (Jo & Harjoto, 2012; Rodgers, Choy, & Guiral, 2013; Torugsa, O'Donohue, & Hecker, 2013; Tsai & Wu, 2022). Moreover, studies show that CSR activities can reduce the degree of information asymmetry and ease the conflict of interests between shareholders and other stakeholders (Freeman, 1994; Harjoto & Jo, 2011; Jensen, 2010). Studies also show that CSR can be converted into long-term operating performance for the company itself and increase its corporate value for the shareholders (Bouslah, Hmaittane, Kryzanowski, & M'Zali, 2022; Du, Bhattacharya, & Sen, 2010; Harjoto & Laksmana, 2018; Jamali & Mirshak, 2007).

While the CSR initiatives are expected to be beneficial for shareholders, the success of a CSR strategy largely depends on the firm's quality of corporate governance (Chan et al., 2014; Hong et al., 2016), which covers the areas of ownership structure (Li & Zhang, 2010; Padgett & Galan, 2010), board features and structure (Chang, Oh, Park, & Jang, 2017; Katmon, Mohamad, Norwani, & Al Farooque, 2019; Lau, Lu, & Liang, 2016; Liao, Lin, & Zhang, 2018), CEO background (Bose, Ali, Hossain, & Shamsuddin, 2022; Meier & Schier, 2021; Xu & Ma, 2022; Zhang, Xu, & Chen, 2022), *etc*. Moreover, many other governance factors are shown to affect the implementation of CSR. For example, CEO morals and values (Godos-Díez, Fernández-Gago, & Martínez-Campillo, 2011), firm reputation (Chan et al., 2014), analyst tracking (Harjoto & Jo, 2011), foreign consumers or investors' supervision (Chapple & Moon, 2005; Kao, Yeh, Wang, & Fung, 2018; McGuinness, Vieito, & Wang, 2017), media supervision (Xu & Huang, 2015), board of directors with higher independence (Harjoto & Jo, 2011), higher internal control quality (Li & Zhang, 2017; Peng & Chen, 2015).

A strand of literature recommends D&O insurance as an effective governance factor. D&O insurance providers actively participate in the process of pre-approval, in-process supervision, and post-investigation during the underwriting process (Bhagat, Brickley, & Coles, 1987; Chi, Gong, Weng, & Chen, 2013; Holderness, 1990; O'Sullivan, 1997) and hence play an active corporate governance role (Chen & Chang, 2011). The purchase of D&O insurance can better retain independent directors (Gardner & Fulton, 2007; MacMinn, Ren, & Han, 2012), promote their supervision of management, and increase corporate value (Holderness, 1990; O'Sullivan, 1997; Priest, 1987).

We propose that D&O insurance, as an effective governance factor, can positively affect firms' CSR initiatives. D&O insurance policies typically require companies to adhere to legal and regulatory requirements. To maintain coverage, companies need to stay up-to-date with evolving CSR-related regulations and standards. This can result in a proactive approach to CSR compliance to ensure that the company is meeting legal obligations and staying aligned with emerging CSR guidelines. Moreover, under the monitor of D&O insurance, directors and officers are more inclined to promote ethical behavior and responsible corporate governance. A commitment to ethical conduct aligns with CSR principles, and D&O insurance can serve as an additional incentive for leaders to act responsibly and avoid actions that could lead to legal liability. Therefore, we build a hypothesis that predicts a positive relationship between D&O insurance and CSR activities. We name it *Governance Hypothesis*.

However, another line of studies suggests the opposite. They argue that the insurance offers protection to managers and hence induces their moral hazard reflected in poor corporate decisions (Boubakri, Ghalleb, & Boyer, 2008; Boyer & Tennyson, 2015; Chalmers, Dann, & Harford, 2002; Chang & Chen, 2018; Core, 1997; Li & Liao, 2014; Lin, Officer, Wang, & Zou, 2013; Lin, Officer, & Zou, 2011; Rees, Radulescu, & Egger, 2011). One important reason is that the purchase of D&O insurance in the US and Canada is a decision made by the managers to be covered by the insurance, not by the approval of the shareholders (Core, 1997). Moreover, the D&O insurance providers even purposefully insure companies with higher litigation risk, so they can charge higher fees and premiums (Baker & Griffith, 2007). Some studies also find that D&O insurance is associated with poor financial conditions (Boyer, 2007), inadequate profitability (Cao & Narayanamoorthy, 2014), and high litigation risks (Zou et al., 2008). Based on this line of literature, we develop a competing hypothesis called *Spoiling Hypothesis*. It predicts a negative relationship between the presence of D&O insurance and CSR

success, as a result of induced managerial moral hazard by the insurance.

H1a. *Governance Hypothesis*: D&O insurance will increase CSR performance.

H1b. *Spoiling Hypothesis*: D&O insurance will reduce CSR performance.

If *Governance Hypothesis* holds and D&O insurance serves as an effective governance factor, then the effect of D&O insurance should be more pronounced when corporate governance is weaker at the insured firm, because such managers will receive more monitoring forces from the insurance providers in order to meet the standard.

H2a. *Improved Governance Hypothesis*: The effect of D&O insurance on CSR is more pronounced when corporate governance is weaker.

Pursing CSR could involve risks. For example, if a company fails to deliver on its CSR commitments or faces public criticism for its actions, its reputation can suffer. Some CSR initiatives require significant financial investments. If not managed effectively, these expenses can impact a company's financial performance. It is also possible that D&O insurance encourages managers taking risks to pursue CSR activities, as the insurance provides financial protection to them against personal liability for decisions made in their roles. As a result, executives may feel more comfortable taking proactive steps to promote CSR within the company without the fear of personal financial ruin in case of legal action. If this hypothesis holds true, managers facing higher risks shall receive more protection benefits from the D&O insurance and hence the risk-encouraging effect shall be stronger.

H3a. *Risk Encouragement Hypothesis*: The effect of D&O insurance on CSR is more pronounced when firms face higher risk.

3. Data, variables, and methodology

Referring to the existing research (McGuinness et al., 2017; Rezaee, Dou, & Zhang, 2020), we use the data from Rankins Global (*RKS*) on the disclosure and performance of social responsibilities of publicly listed companies to measure CRS performance. The lower the score of this indicator, the lower the level of social responsibility of the company, indicating a higher degree of conflict of interest with other stakeholders. Our main regression analysis uses CSR performance as the dependent variable. We use the Chinese publicly listed firms from 2008 to 2018 as our initial sample.[3] The data for corporate governance factors, and financial information of the firms, as well as the trading records of their stocks come from the China Stock Market and Accounting Research database (CSMAR). The data of D&O insurance coverage are from the Chinese Research Data Services platform (CNRDS). The sample is sifted after a number of data-filtering steps. In particular, we exclude firms in the financial industry, firms that lack sufficient financial data, firms under special treatment by the securities regulator, and firms with a total debt ratio >1 or <0. Due to the limited availability of CSR reports, the primary regression sample size is small with 6104 firm-year observations.

Table 1 shows the descriptive statistics of our major variables, while the definitions of the variables are in Appendix A. Rks is the CSR performance rating provided by Rankins Global. It has an average of 39.28. The rating agency also gives CSR ratings in four dimensions of holistic governance, content completeness, industry-adjusted level, and technology. The ESG rating published by SynTao Green Finance has an average value of 3.104, corresponding to a rating between B- (assigned a value of 3) and B (assigned a value of 4). The independent variable *Insured* indicates whether the company purchased or renewed D&O insurance that year. Its mean value shows that 12.1% of the sample have made the purchase.

Table 1
Summary statistics.

Variable	Mean	Sd	P50	Max	Min	N
Rks	39.280	12.190	36.770	75.450	18.550	6104
Rks_high	0.480	0.500	0.000	1.000	0.000	6104
ΔRoa	−0.008	0.049	−0.004	0.154	−0.222	6104
ΔRoe	−0.017	0.109	−0.006	0.367	−0.540	6104
Rks_D	0.275	0.447	0.000	1.000	0.000	22,186
Rks_rob	10.807	18.672	0.000	75.450	0.000	22,186
Rks_M	13.648	4.270	13.130	24.610	5.630	5616
Rks_C	17.365	5.848	16.500	34.630	6.190	5615
Rks_I	7.246	1.892	7.010	13.520	3.860	5615
Rks_T	1.813	1.573	1.460	7.140	0.000	5604
Csr	1.003	0.250	0.999	2.224	0.449	6104
Esg	3.104	0.954	3.000	5.000	1.000	2820
Insured	0.121	0.327	0.000	1.000	0.000	6104
InsPre/GDP	3.762	1.099	3.500	6.801	2.122	6104
InsuNum	80.883	72.693	68.000	379.000	0.000	6104
SthInscomp	0.571	1.446	0.000	9.360	0.000	6104
InsuLen	0.776	2.416	0.000	11.000	0.000	6104
Fee	0.078	0.058	0.065	0.351	0.009	6104
AuditFee	0.000	0.001	0.000	0.008	0.000	5994
Insthold	0.411	0.227	0.434	0.866	0.007	6104
LegalEnv	0.320	0.466	0.000	1.000	0.000	6104
Export	0.473	0.499	0.000	1.000	0.000	6104
Crosslist	0.133	0.339	0.000	1.000	0.000	6104
Voluntary	0.412	0.492	0.000	1.000	0.000	6104
Reputation	0.371	0.483	0.000	1.000	0.000	6104
Size	23.040	1.389	22.930	26.060	19.640	6104
Lev	0.492	0.197	0.504	0.893	0.052	6104
Dirnum	9.246	1.947	9.000	15.000	5.000	6104
Outdir	0.374	0.055	0.364	0.571	0.333	6104
Separate	5.613	8.284	0.000	29.320	0.000	6104
Lsh	38.080	15.890	37.710	74.980	8.773	6104
Dual	0.163	0.370	0.000	1.000	0.000	6104
Cf	0.054	0.070	0.052	0.248	−0.174	6104
Cash	0.148	0.110	0.118	0.618	0.010	6104
Inst	0.416	0.227	0.442	0.831	0.001	6104
Big4	0.149	0.356	0.000	1.000	0.000	6104
Age	2.814	0.341	2.890	3.434	1.609	6104
Roe	0.081	0.111	0.083	0.335	−0.668	6104
Turnover	0.764	0.578	0.622	3.712	0.072	6104
Ret	0.092	0.550	−0.051	2.587	−0.718	6104
Tq	1.843	1.166	1.453	8.735	0.896	6104

This table presents the summary statistics of all the variables used in this study. All variable definitions are in Appendix A.

Based on the data, we run our testing model as the following:

$$Rks_{i,t} = \beta_0 + \beta_1 D\&O\ Insured_{i,t} + \beta_2 Controls_{i,t} + \sum Year_{i,t} + \sum Ind_{i,t} + \sum Prov_{i,t} + \xi_{it} \quad (1)$$

where *Rks* is the proxy for CSR. *Insured* is the dummy variable for D&O insurance coverage. The model controls for various factors such as company size, leverage, Tobin's Q, return, number of directors, proportion of independent directors, duality, separation, top shareholder ownership, cash flow, cash, company age, ROE, turnover, institutional shareholder ownership, and firm auditor status. The regression model controls for the fixed effects of year, industry, and province and clusters the standard errors of all regression coefficients at the firm level. The specific definitions of these variables are shown in Appendix A. We focus on the regression coefficient β_1 for Insured. If β_1 is significantly negative, it supports the hypothesis that the purchase of D&O insurance increases the moral hazard of insiders, reducing CSR performance. If β_1 is significantly positive, it supports the hypothesis that D&O insurance plays a governance role, improving CSR performance.

We further investigate the role of D&O insurance in the positive relation between CSR and firm's operating performance, which is found in other market settings (Bouslah et al., 2022; Du et al., 2010; Harjoto & Laksmana, 2018; Jamali & Mirshak, 2007). Specifically, we use the

[3] Rankins issued CSR ratings for the period of 2008–2018 and then replace it with ESG ratings staring in 2019. We also use ESG scores from 2015 to 2020 released by SynTao Green Finance Corporation for a later robustness check.

increment of return on assets (ΔRoa) and the return on equity (ΔRoe) to measure the long-term performance of companies. Model (2) is constructed to examine the link between long-term performance and CSR performance in the presence of D&O insurance:

$$\Delta Roa_{i,t} = \beta_0 + \beta_1 Rks\_high_{i,t} + \beta_2 Rks\_high_{i,t} \text{ x } Insured + \beta_3 Control\ Variables_{i,t} + \sum Year_{i,t} + \sum Ind_{i,t} + \sum Prov_{i,t} + \xi_{it} \quad (2)$$

The variable Rks_high is a dummy variable that indicates whether firm *i* is above the median of CSR scores of its "industry-year" categories. Primarily, we run the model with the full sample and observe the estimate for β_2, the coefficient of CSR interacting with D&O insurance. β_2 is expected to be positive, as we propose that better CSR performance combined with D&O insurance can promote long-term performance. Secondly, we omit the interaction variable and observe the β_1 for the group of companies with D&O insurance coverage compared to the group without. If the regression coefficient β_1 is significantly positive in the group with insurance coverage and passes the inter-group coefficient difference test, it indicates that D&O insurance strengthens the link between CSR and operating performance.

4. Empirical results

4.1. Main results

Table 2 shows the main result of our study. It shows that companies whose managers are covered with D&O insurance tend to have higher CSR scores, indicating better disclosure and performance of corporate social responsibility. On average, companies with the insurance coverage have a CSR score that is 2.8565 points higher compared to companies without coverage. we also calculate the Variance Inflation Factor for our main analysis in Table 2 Column (3). The mean VIF equals 2.40, a value that indicates insignificant multicollinearity of our control variables.

To further understand how D&O insurance could affect CSR performance, we conduct a regression analysis of Eq. (1) based on the influence of insurance industry on the relationship between D&O insurance and CSR. In particular, we segment our sample based on the level of influence of insurance industry and run group testing the influence of insurance industry is measured by the local insurance revenue scaled by local GDP (InsPre/GDP), the proportion of ownership by insurance companies (*SthInscomp*), and the number of insurance companies within a certain distance from the company (*InsuNum*). This analysis is presented in the first six columns of Table 3.

The coefficients of D&O insurance are significantly positive in the provinces with high insurance revenue in Column (1) and more insurance companies in Column (3) and when more ownership of the company is possessed by insurance companies in Column (5), whereas for companies under weak influence in Column (2), (4) and (6), D&O insurance does not appear significantly affecting their CSR performances. This result suggests that D&O insurance has a stronger promotion effect on CSR performance when the firm is operating in a better insurance environment, where insurance companies have greater influence and higher monitoring ability on the locally listed firms.

4.2. Moderating effect of corporate governance

Since D&O insurance promotes CSR performance through better governance mechanism, we further test the moderating effect of corporate governance on the effectiveness of D&O insurance. To measure the level of governance, we use the following proxies: CEO duality (*Dual*), the proportion of independent directors (*Outdir*), agency costs (*Fee*), audit fees (*AuditFee*), the proportion of institutional investors holding shares excluding insurance companies (*Insthold*), the legal environment score (*LegalEnv*), and dummy for cross-listing (*Crosslist*).

Table 2
The effect of D&O insurance on CSR performance.

	(1)	(2)	(3)
Variables	Rks	Rks	Rks
Insured	8.8924***	3.2499***	2.8565**
	(6.3339)	(2.8873)	(2.5687)
Size		4.1064***	3.1048***
		(12.3696)	(8.6847)
Lev		−8.3759***	−1.8198
		(−4.4195)	(−0.8858)
Dirnum		0.1161	0.4301**
		(0.6326)	(2.5152)
Outdir		−0.2296	0.2248
		(−0.0433)	(0.0450)
Separate		−0.0378	−0.0410
		(−0.9616)	(−1.1283)
Lsh		0.0059	0.0209
		(0.2727)	(1.0251)
Dual		−0.0056	−0.8249
		(−0.0092)	(−1.5349)
Cf		6.8455**	5.9407**
		(2.1271)	(2.0610)
Cash		−1.6952	1.1388
		(−0.6456)	(0.4310)
Inst		2.9019**	0.5085
		(2.2048)	(0.4119)
Big4		3.5589***	3.7976***
		(2.6839)	(3.0082)
Age		1.4177	−2.4812**
		(1.4429)	(−2.3347)
Roe		−5.5771***	−0.0870
		(−2.7673)	(−0.0464)
Turnover		1.0185*	0.7351
		(1.9434)	(1.4324)
Ret		−0.2957	0.5822**
		(−1.2927)	(2.2401)
Tq		0.5318**	−0.0342
		(2.1215)	(−0.1372)
Constant	38.2021***	−59.7447***	−38.1591***
	(101.3030)	(−8.1645)	(−4.6458)
Year&Ind&Pro	No	No	Yes
Observations	6104	6104	6104
R-squared	0.057	0.271	0.412

This paper reports the impact of D&O insurance on CSR performance of the firm. The dependent variable *Rks* is the firm's CSR score rated by Rankins Global (RKS) on the disclosure and performance of social responsibilities of publicly listed companies to measure CRS performance. *Insured* equals 1 if the firm has purchased D&O insurance in the year, and 0 otherwise. Definitions of other variables are presented in Appendix A. Year, industry, and province fixed effects are excluded in Column (1) and (2) and included in Column (3). T-statistics are in parentheses with standard errors clustered at the firm level. ***, **, and * indicate 1%, 5%, and 10% significance levels, respectively.

The established theories suggest that for companies with a separation of CEO and chairman roles, a higher proportion of independent directors, lower agency costs and audit fees, a higher proportion of institutional investors, and operating in regions with a better legal environment, multinational operations usually have better performance in CSR (Chapple & Moon, 2005; McGuinness et al., 2017). If D&O insurance can indeed strengthen the role of internal and external supervisory governance, then in groups better governance, the role of D&O insurance in improving CSR should be stronger.

If the regression coefficient of the main explanatory variable is significantly positive and the inter-group coefficient difference test is passed, it indicates that D&O insurance can strengthen internal and external supervisory governance, and thereby improve CSR. Table 4 shows the results of group testing with the sample firms segmented by CEO duality in Column (1) and (2), the ratio of independent directors in Column (3) and (4), management fee for agency cost in Column (5) and (6) and auditing fee in Column (7) and (8). The strong effect of D&O insurance on CSR performance is mainly driven by the firms with dual CEOs, less independent directors, high agency costs, and high auditing

Table 3
The effect of D&O insurance on CSR performance by access to insurance providers.

Variables	(1)	(2)	(3)	(4)	(5)	(6)
	Rks	Rks	Rks	Rks	Rks	Rks
	Insurance premium / GDP		Number of insurance companies (<50 km)		Shareholdings of insurance companies	
	High	Low	High	Low	High	Low
Insured	3.2029**	0.6885	3.4499**	1.8013	4.7556***	1.9388
	(2.3385)	(0.4014)	(2.4228)	(1.1582)	(2.8761)	(1.6351)
Size	2.9571***	3.1319***	2.5636***	3.4601***	3.8028***	3.0011***
	(6.5294)	(6.0255)	(4.7482)	(7.7532)	(6.6415)	(7.8316)
Lev	−1.4437	−1.4310	0.5525	−3.3500	−3.5426	−1.9436
	(−0.5750)	(−0.5195)	(0.1786)	(−1.4558)	(−1.0938)	(−0.9117)
Dirnum	0.4878**	0.3451	0.3070	0.5649***	−0.0548	0.5741***
	(2.2200)	(1.5832)	(1.0992)	(2.8865)	(−0.2059)	(3.2051)
Outdir	2.5912	−6.8324	5.8852	−2.5307	−2.3770	0.1916
	(0.3594)	(−1.2503)	(0.7301)	(−0.4620)	(−0.2974)	(0.0360)
Separate	−0.0747	0.0181	−0.0908*	−0.0167	−0.0185	−0.0520
	(−1.4936)	(0.3926)	(−1.6723)	(−0.3715)	(−0.3288)	(−1.4078)
Lsh	0.0343	0.0052	0.0365	0.0174	0.0466	0.0110
	(1.2830)	(0.1913)	(1.0879)	(0.7259)	(1.2830)	(0.5548)
Dual	−0.9770	−0.5900	−1.7121**	−0.3636	−0.6108	−0.7802
	(−1.3832)	(−0.8114)	(−2.1992)	(−0.5038)	(−0.5893)	(−1.4101)
Cf	5.9918	5.8251*	9.4164**	1.8627	2.7001	7.8506***
	(1.4699)	(1.7398)	(2.0285)	(0.5830)	(0.4818)	(2.6593)
Cash	−2.6299	6.0354	−5.0512	7.8552**	0.6730	1.5109
	(−0.8204)	(1.5331)	(−1.3581)	(2.4081)	(0.1487)	(0.5671)
Inst	0.4824	−0.3321	1.2952	−0.4489	−1.4525	1.7647
	(0.2956)	(−0.2031)	(0.6414)	(−0.3228)	(−0.6797)	(1.4096)
Big4	5.0542***	1.3169	4.9279***	2.3237	6.1395***	2.8982**
	(3.2999)	(0.6589)	(2.9361)	(1.3697)	(3.5970)	(2.1269)
Age	−2.6074*	−1.3937	−1.7392	−3.1429**	−1.2302	−2.4243**
	(−1.8815)	(−0.9677)	(−1.1586)	(−2.2980)	(−0.6881)	(−2.2406)
Roe	2.2869	−0.6697	2.5047	−2.5472	0.5531	−0.2389
	(0.9340)	(−0.2880)	(0.7809)	(−1.1425)	(0.1372)	(−0.1281)
Turnover	0.1954	0.8954	−0.9616	1.6595***	0.7922	0.5802
	(0.2745)	(1.3708)	(−1.1612)	(2.7462)	(0.7815)	(1.1891)
Ret	1.0123***	0.1284	0.5163	0.3702	0.0189	0.7931**
	(2.5922)	(0.3705)	(1.1707)	(1.1294)	(0.0278)	(2.5343)
Tq	0.0043	−0.1072	−0.4296	0.3609	0.2851	−0.0917
	(0.0135)	(−0.3120)	(−1.0962)	(1.1857)	(0.6653)	(−0.3570)
Constant	−36.1612***	−37.6854***	−27.3609**	−49.3873***	−51.5315***	−37.2479***
	(−3.2980)	(−3.3018)	(−2.1615)	(−4.8996)	(−3.7282)	(−4.2866)
Year&Ind&Pro	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3436	2668	2802	3302	1659	4445
R-squared	0.449	0.406	0.442	0.424	0.455	0.417
Chi2	6.14**		2.95*		7.00***	

This table presents the effect of D&O insurance on CSR performance based on the access to insurance providers. In Column (1) and (2), the sample firms are segmented based on the income of the insurance industry in the province of the firm scaled by the province's GDP. In Column (3) and (4) the samples are segmented by the number of insurance companies surrounding the firm. In Column (5) and (6) the samples are segmented by the ownership of the firm held by insurance companies. The dependent variable *Rks* is the firm's CSR score rated by Rankins Global (RKS) on the disclosure and performance of social responsibilities. *Insured* equals 1 if the firm has purchased D&O insurance in the year, and 0 otherwise. Definitions of other variables are presented in Appendix A. Year, industry and province fixed effects are controlled. T-statistics are in parentheses with standard errors clustered at the firm level. ***, **, and * indicate 1%, 5%, and 10% significance levels, respectively.

fees in Column (1), (4), (5), and (7), all indicating a weak governance structure. The Chi-squares are also statistically significant in the four group difference tests. These results support the notion that D&O insurance can function as an effective governance tool when strong internal governance is not available.

In the same spirit, we test the moderating effect of external governance on the relationship between D&O insurance and CSR performance. Table 5 shows our main regression results for samples segmented by the level of external factors that could affect the level of governance. These factors include institutional ownership, the quality of legal environment, and cross-listing for stock trading. The underlying rationale is that the firm governance is weaker when institutional ownership is low, the legal environment is inadequate, and no approval by foreign stock exchanges. As expected, the effect of D&O insurance on CSR performance is more pronounced when those external factors have a weak impact on the firm governance, as the coefficients of D&O insurance in Column (2), (4), and (6) are significant. In stark contrast, the coefficients of D&O insurance in other columns are insignificant, suggesting the effect of D&O insurance is marginal in the presence of strong governance. It is also worth mentioning that the type of institutional ownership offers different mechanisms. From the last two columns in Table 3, one can see that high ownership by insurance companies can promote the effect of D&O insurance, whereas the last two columns in Table 5 show that high ownership by non-insurance institutions can diminish the effect of D&O insurance.

4.3. Moderating effect of managerial motivation

In this section, we test whether D&O insurance promotes CSR performance by encouraging more public disclosure of the companies. If the disclosure is enforced, either by the pressure of authority mandate or by the motivation to recover damaged reputation, then the disclosure would have a weaker effect on CSR performance. For example, mandatory disclosure can change corporate behaviors and hurt shareholder interests (Chen, Hung, & Wang, 2018), so the social responsibility taken by the shareholders is unlikely to be a long-term

Table 4
The effect of D&O insurance on CSR performance based on corporate governance.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Rks	Rks	Rks	Rks	Rks	Rks	Rks	Rks
	Dual		Outdir		Fee		AuditFee	
	Yes	No	High	Low	High	Low	High	Low
Insured	6.2927***	2.5280**	1.7563	3.6099***	3.8773***	1.8225	3.6278***	1.7410
	(3.0400)	(2.1908)	(1.2761)	(2.8139)	(2.7161)	(1.3516)	(2.6517)	(1.1827)
Size	2.2999***	3.1230***	2.9118***	3.2439***	3.5144***	3.0446***	2.5969***	4.2154***
	(4.0136)	(7.9301)	(7.1515)	(6.9187)	(7.3187)	(6.9784)	(4.9326)	(7.4988)
Lev	−2.2313	−1.4699	−1.0842	−3.1278	−2.0809	−1.0865	0.7515	−1.6894
	(−0.6183)	(−0.6580)	(−0.4088)	(−1.2855)	(−0.9009)	(−0.3751)	(0.3629)	(−0.4946)
Dirnum	0.8195***	0.3724*	0.6005***	0.2623	0.3960*	0.4816**	0.2861	0.4888**
	(3.1754)	(1.9405)	(3.1335)	(1.0892)	(1.8420)	(2.1061)	(1.4992)	(2.0527)
Outdir	23.9688***	−2.4903	8.8189	12.8593	−1.3283	−1.8101	4.5979	−8.6117
	(2.9382)	(−0.4576)	(1.3996)	(0.9405)	(−0.2153)	(−0.2775)	(0.8020)	(−1.2177)
Separate	0.0165	−0.0541	−0.0596	−0.0346	−0.0453	−0.0603	−0.0025	−0.0432
	(0.2828)	(−1.3676)	(−1.1968)	(−0.8360)	(−0.9477)	(−1.3584)	(−0.0536)	(−0.9013)
Lsh	0.0042	0.0264	0.0469**	0.0031	0.0216	0.0377	−0.0039	0.0392
	(0.1455)	(1.1343)	(2.0213)	(0.1136)	(0.9254)	(1.3523)	(−0.1731)	(1.3020)
Dual			−0.7376	−0.6467	−1.1141	−0.6909	−1.3022**	−1.0108
			(−1.0533)	(−0.9186)	(−1.5724)	(−0.9715)	(−2.1132)	(−1.1885)
Cf	4.3612	5.7894*	6.6660*	5.9399*	4.5825	6.6573*	5.2198	5.3052
	(0.9134)	(1.7723)	(1.6970)	(1.7230)	(1.2178)	(1.8474)	(1.4706)	(1.2514)
Cash	3.4083	0.3760	2.5908	0.9784	2.4518	0.9471	−0.4084	3.6144
	(0.8684)	(0.1250)	(0.7497)	(0.3099)	(0.8298)	(0.2727)	(−0.1180)	(0.8900)
Inst	1.7335	0.0141	−0.4585	1.4016	−1.9067	2.7883	−0.1804	−0.0500
	(0.9619)	(0.0102)	(−0.2895)	(0.9426)	(−1.2744)	(1.5801)	(−0.1303)	(−0.0277)
Big4	1.0627	4.1840***	4.8462***	3.4709**	1.5790	5.5294***	3.2842**	4.4549**
	(0.5965)	(3.1258)	(3.3526)	(2.1701)	(0.9773)	(3.6596)	(1.9942)	(2.4778)
Age	−3.1147*	−2.1761*	−4.9778***	−0.4547	−0.5387	−4.3625***	−2.4820**	−1.7606
	(−1.9582)	(−1.7901)	(−3.5917)	(−0.3584)	(−0.4099)	(−3.2604)	(−2.1278)	(−1.0747)
Roe	4.8891	−0.4763	−0.9123	0.5487	0.1025	−0.3114	1.7018	−2.2836
	(1.3169)	(−0.2356)	(−0.3641)	(0.2337)	(0.0494)	(−0.1113)	(0.7670)	(−0.7904)
Turnover	−0.0891	0.7344	−0.4409	1.3479**	1.8118**	1.1125*	−0.1389	0.9825
	(−0.0945)	(1.3326)	(−0.6084)	(2.2568)	(2.1313)	(1.8901)	(−0.1622)	(1.6173)
Ret	0.3721	0.6954**	0.2650	0.6668*	0.3831	0.3333	0.6144*	0.2186
	(0.5457)	(2.1940)	(0.6332)	(1.8666)	(0.9770)	(0.8697)	(1.6561)	(0.5467)
Tq	−0.5287	0.0660	0.0918	−0.2116	0.0021	0.1235	−0.0742	0.4499
	(−1.4239)	(0.2345)	(0.2751)	(−0.7082)	(0.0074)	(0.3320)	(−0.2660)	(0.9540)
Constant	−31.1059**	−38.5337***	−32.6567***	−49.3996***	−51.5204***	−35.4693***	−28.8500**	−63.3895***
	(−2.5123)	(−4.2334)	(−3.4899)	(−4.3018)	(−4.9724)	(−3.3134)	(−2.5020)	(−4.7384)
Year&Ind&Pro	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	998	5106	2454	3650	2931	3173	3043	2951
R-squared	0.462	0.425	0.479	0.414	0.421	0.457	0.377	0.458
Chi2	5.41**		3.61*		4.50**		3.75*	

This table presents the effect of D&O insurance on CSR performance by the level of internal corporate governance. The dependent variable *Rks* is the firm's CSR score rated by Rankins Global (RKS) on the disclosure and performance of social responsibilities. The samples are segmented based on CEO duality in Column (1) and (2), the ratio of outside directors on the board in Column (3) and (4), the level of managerial expenses in Column (5) and (6) and the level of auditing fees in Column (7) and (8). *Insured* equals 1 if the firm has purchased D&O insurance in the year, and 0 otherwise. Definitions of other variables are presented in Appendix A. Year, industry and province fixed effects are controlled. T-statistics are in parentheses with standard errors clustered at the firm level. ***, **, and * indicate 1%, 5%, and 10% significance levels, respectively.

strategic plan. Moreover, the managers who are reported negatively by the media have a motivation to recoup their reputation through more public disclosure and more CSR activities, but here could be false information release and the effect may backfire (Yoon, Gürhan-Canli, & Schwarz, 2006). The disclosure under such circumstances cannot truly promote transparency and cannot promote CSR performance. In this case, D&O insurance can function as a complementary tool to improve the CSR, so the effect of D&O insurance on CSR performance should be stronger. On the other hand, if the disclosure is voluntary, then it indicates the firm itself takes greater initiatives to promote its CSR and the role played by D&O insurance would be limited.

To perform the test, we segment our samples based on disclosure motivation. As shown in Table 6, the motivation would be legitimate when the disclosure is voluntary in Column (1) and when there are no negative reports about the firm's CEO are not motivated to recover the damaged reputation in Column (4). The coefficients of D&O insurance are insignificant in these columns, indicating weak influence of D&O insurance when the firm's disclosure motivation is legit. In contrary, Column (2) and (3) show a strong and significant effect of D&O insurance when the disclosure motivation is driven by authority mandate and reputation restoration. The chi-square for the group difference testing is also strong, indicating that disclosure motivation plays a strong moderating role in the relationship between D&O insurance and CSR performance.

4.4. Moderating effect of legal risks

It is also plausible that D&O insurance induces managers to take more risks pursuing CSR, as suggested by Hypothesis 3. In Table 7, we segment our sample based on managers' exposure to legal risk. If D&O insurance shields the managers from the risks, then its effect should be more pronounced for firms facing higher levels of risk. However, contrary to this hypothesis, we observe that for firms facing more lawsuits or major lawsuits, the coefficient representing the D&O effect is smaller and statistically insignificant in Column (1) and (3). This suggests that the insurance's effect is not pronounced when the firms face higher legal

Table 5
The effect of D&O insurance on CSR performance based on external monitoring factors.

Variables	(1)	(2)	(3)	(4)	(5)	(6)
	Rks	Rks	Rks	Rks	Rks	Rks
	Insthold		LegalEnv		Crosslist	
	High	Low	High	Low	Yes	No
Insured	1.9101	3.6416***	1.1756	3.9084***	0.1828	2.4562*
	(1.3033)	(2.7765)	(0.7060)	(3.3848)	(0.0898)	(1.9529)
Size	3.3425***	2.8747***	3.1294***	3.0626***	4.2257***	2.7161***
	(6.8112)	(7.3444)	(4.7164)	(9.3369)	(3.6495)	(7.1464)
Lev	−2.0858	−0.9014	0.4115	−2.0826	15.8628***	−4.0657**
	(−0.6903)	(−0.4354)	(0.1161)	(−1.0368)	(2.6669)	(−1.9698)
Dirnum	0.1858	0.6440***	0.3122	0.4788***	0.9306*	0.2954*
	(0.7767)	(3.3319)	(0.9683)	(2.7506)	(1.8122)	(1.6513)
Outdir	−7.8958	5.0812	−8.7923	2.4180	−13.5752	−0.6928
	(−1.1944)	(0.9328)	(−0.9870)	(0.4998)	(−0.9823)	(−0.1291)
Separate	−0.0333	−0.0497	−0.0964	−0.0123	−0.2561**	−0.0060
	(−0.7783)	(−1.0161)	(−1.4909)	(−0.3346)	(−2.0151)	(−0.1675)
Lsh	0.0060	0.0039	0.0377	0.0158	0.0458	0.0315
	(0.1904)	(0.1684)	(1.1119)	(0.7818)	(0.6358)	(1.5267)
Dual	−0.0966	−1.1357*	−0.9185	−0.7090	−1.4962	−0.7885
	(−0.1209)	(−1.8455)	(−1.0349)	(−1.2316)	(−0.8705)	(−1.4817)
Cf	6.9489*	5.8487*	6.3679	5.3345*	22.3431**	4.1771
	(1.8490)	(1.6802)	(1.3465)	(1.7172)	(2.2532)	(1.4700)
Cash	−1.1643	3.7569	−2.9243	3.6908	0.3274	0.0685
	(−0.2977)	(1.3565)	(−0.6702)	(1.3673)	(0.0292)	(0.0280)
Inst	4.0228	−1.3743	1.5299	−0.2454	2.7390	0.7875
	(1.3941)	(−0.6586)	(0.7125)	(−0.1965)	(0.7461)	(0.6456)
Big4	3.7080**	3.7650**	4.9413**	2.8405**	1.3702	2.9506*
	(2.3196)	(2.4377)	(2.5668)	(2.2463)	(0.5335)	(1.7132)
Age	−2.5026	−2.0391*	−1.9435	−2.6613**	0.2555	−1.7814
	(−1.5636)	(−1.8566)	(−1.1206)	(−2.4281)	(0.0629)	(−1.6332)
Roe	−3.7877	1.8804	−3.1298	0.5125	5.9222	−0.3924
	(−1.3458)	(0.8543)	(−0.7884)	(0.2771)	(1.1056)	(−0.2046)
Turnover	1.7543**	−0.0761	−0.3588	1.3644**	−1.5735	0.8715*
	(2.4111)	(−0.1247)	(−0.4283)	(2.5170)	(−0.8976)	(1.7213)
Ret	0.6266	0.6197	0.1509	0.6968**	−0.3005	0.6809**
	(1.5733)	(1.5387)	(0.3440)	(2.0224)	(−0.3646)	(2.5552)
Tq	−0.1226	0.1126	0.1830	−0.0374	−1.2451	−0.1362
	(−0.3756)	(0.3761)	(0.4538)	(−0.1359)	(−0.7997)	(−0.5633)
Constant	−38.2083***	−38.4799***	−39.4091***	−36.2809***	−93.5910***	−29.3309***
	(−3.3017)	(−4.2880)	(−2.6283)	(−4.7060)	(−2.9400)	(−3.5755)
Year&Ind&Pro	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2931	3173	1951	4153	811	5293
R-squared	0.454	0.423	0.468	0.414	0.632	0.369
Chi2	3.18*		7.39***		3.67*	

This table presents the effect of D&O insurance on CSR performance by the level of institutional monitoring. The dependent variable *Rks* is the firm's CSR score rated by Rankins Global (RKS) on the disclosure and performance of social responsibilities. *Insured* equals 1 if the firm has purchased D&O insurance in the year, and 0 otherwise. Column (1) and (2) present the results for the samples with institutional ownership and without, respectively. Column (3) and (4) present the results for the sample firms in a province with higher scores for legal environment and lower scores, respectively. Column (5) and (6) present the results for the sample firms cross listed overseas and only listed domestically, respectively. Definitions of other variables are presented in Appendix A. Year, industry and province fixed effects are controlled. T-statistics are in parentheses with standard errors clustered at the firm level. ***, **, and * indicate 1%, 5%, and 10% significance levels, respectively.

risk. Therefore, the financial shield provided by D&O insurance does not encourage the managers engaging risky activities related to CSR.

On the other hand, the insurance effect is stronger and significant for firms facing less lawsuits or no major lawsuits, as indicated by Column (2) and (4). it provides some support to the Governance Hypothesis in H2. That is, D&O insurance promotes CSR by improving governance, which may be represented by less risk-taking activities in this case. This evidence is not strong because the statistical difference between the groups of high-risk firms and low-risk firms (Column 1 *versus* Column 2, Column 3 *versus* Column4) is insignificant, as indicated by the Chi-square of the two regression analyses. The economic significance for the group difference is also slim. Nevertheless, the overall findings at least allow us to reject the notion that D&O insurance promotes CSR by encouraging risky activities related to CSR.

4.5. Economic effect

Studies show that CSR performance can promote firms' financial and operating performance (Luo & Bhattacharya, 2006; Orlitzky, Schmidt, & Rynes, 2003). Table 8 shows that CRS ranking is positively associated with operating performance, proxied by the change of ROA and ROE, but only when the D&O insurance is at presence in Column (1) and (3). If a firm's CSR ranking is above the median, then the ROA (ROE) is expected to be 1.06% (2.64%) higher. For most of the sample firms uncovered by D&O insurance, however, the relationship between CSR and operating performance is insignificant, as shown by the coefficients of the insurance dummy in Column (2) and (4). The result shows that D&O insurance can strengthen the link between CSR and operating performance. It supports the notion that D&O insurance provides an effective governance component that makes the efforts in CSR more aligned with the shareholders' long-term interests.

Table 6
The moderating effect of managerial motivation.

Variables	(1)	(2)	(3)	(4)
	Rks	Rks	Rks	Rks
	Voluntary disclosure		Negative reports	
	Yes	No	Yes	No
Insured	−0.3052	3.8542***	4.3584***	1.6850
	(−0.2527)	(2.7476)	(2.9774)	(1.5626)
Size	2.3835***	3.6676***	3.5054***	2.5690***
	(5.1635)	(7.2714)	(7.5908)	(6.8465)
Lev	−3.5337*	0.1459	−2.0895	−0.6431
	(−1.6613)	(0.0474)	(−0.7162)	(−0.3119)
Dirnum	0.4375**	0.3541	0.4363*	0.4089**
	(2.2084)	(1.5509)	(1.7668)	(2.2639)
Outdir	2.1116	−2.3631	−6.8826	4.2834
	(0.3492)	(−0.3517)	(−1.1042)	(0.8061)
Separate	−0.0358	−0.0273	−0.0359	−0.0345
	(−0.8473)	(−0.5422)	(−0.6959)	(−0.9401)
Lsh	0.0236	0.0318	0.0221	0.0210
	(1.1712)	(0.9936)	(0.7582)	(1.0120)
Dual	−1.0614*	−0.5325	−1.0820	−0.7924
	(−1.7222)	(−0.6480)	(−1.3303)	(−1.4100)
Cf	5.8406	4.8940	8.4663**	3.2781
	(1.5927)	(1.2446)	(2.0565)	(1.0557)
Cash	−0.2595	0.9486	2.0134	2.2736
	(−0.0945)	(0.2439)	(0.5676)	(0.8385)
Inst	1.4994	0.6040	0.7606	0.4136
	(1.0997)	(0.3317)	(0.4233)	(0.3156)
Big4	1.7584	3.6877**	3.8512**	3.2337**
	(0.9038)	(2.5253)	(2.4694)	(2.3219)
Age	−1.6265	−1.7195	−2.6942*	−1.6987*
	(−1.6131)	(−0.9439)	(−1.8814)	(−1.6805)
Roe	0.8502	−0.0608	−3.4939	3.4572*
	(0.4397)	(−0.0199)	(−1.2514)	(1.7488)
Turnover	0.7876	0.4887	0.9529	0.2655
	(1.2935)	(0.6642)	(1.3861)	(0.4841)
Ret	0.6689	0.4306	0.4494	0.5173
	(1.5694)	(1.2709)	(1.0002)	(1.3798)
Tq	0.1933	−0.2505	0.0810	−0.1090
	(0.6320)	(−0.6705)	(0.2198)	(−0.4279)
Constant	−25.8198**	−50.9013***	−45.3766***	−30.2482***
	(−2.5364)	(−4.0390)	(−4.2041)	(−3.5189)
Year&Ind&Pro	Yes	Yes	Yes	Yes
Observations	2513	3591	2262	3842
R-squared	0.378	0.485	0.473	0.386
Chi2	20.19***		7.20***	

This table presents the effect of D&O insurance on CSR performance based on the legitimacy of managers' motivation to promote CSR. The dependent variable *Rks* is the firm's CSR score rated by Rankins Global (RKS) on the disclosure and performance of social responsibilities. *Insured* equals 1 if the firm has purchased D&O insurance in the year, and 0 otherwise. Definitions of other variables are presented in Appendix A. Column (1) shows the result when the CSR disclosure is voluntary, and Column (2) shows the results when the disclosure is negative. Column (3) shows the result when the firm CEO is covered by negative news reports and Column (4) shows the result of no negative reports. Year, industry, and province fixed effects are controlled in all specifications. T-statistics are in parentheses with standard errors clustered at the firm level. ***, **, and * indicate 1%, 5%, and 10% significance levels, respectively.

Table 7
The moderating effect of legal risk.

Variables	(1)	(2)	(3)	(4)
	Rks	Rks	Rks	Rks
	Number of lawsuits		Major lawsuits	
	High	Low	Yes	No
Insured	1.4378	2.9800**	1.5971	2.9714**
	(0.7956)	(2.5023)	(0.8858)	(2.4881)
Size	3.3089***	3.0480***	3.2919***	3.0589***
	(5.6545)	(7.7398)	(5.6248)	(7.7710)
Lev	−3.2096	−2.1296	−2.9876	−2.1613
	(−1.0052)	(−0.9293)	(−0.9486)	(−0.9374)
Dirnum	0.2460	0.4460**	0.2034	0.4488**
	(0.7976)	(2.4336)	(0.6637)	(2.4436)
Outdir	−11.1811	2.0522	−9.7115	1.8478
	(−1.2539)	(0.3862)	(−1.0505)	(0.3484)
Separate	0.0023	−0.0442	−0.0035	−0.0432
	(0.0349)	(−1.1509)	(−0.0530)	(−1.1211)
Lsh	0.0586	0.0087	0.0614	0.0069
	(1.4639)	(0.4021)	(1.5880)	(0.3145)
Dual	−0.8830	−0.7330	−0.5621	−0.7946
	(−0.9074)	(−1.2159)	(−0.5820)	(−1.3137)
Cf	3.4977	6.7144**	3.6863	6.4991**
	(0.5956)	(2.1225)	(0.6372)	(2.0415)
Cash	5.1713	−0.6847	5.6649	−0.7085
	(1.0711)	(−0.2420)	(1.2021)	(−0.2498)
Inst	1.8636	0.4542	1.8831	0.4546
	(0.8121)	(0.3271)	(0.8410)	(0.3251)
Big4	6.3176***	3.3823**	6.1221***	3.3964**
	(3.1777)	(2.5261)	(3.1415)	(2.5290)
Age	0.3254	−3.1245***	0.4759	−3.1557***
	(0.1814)	(−2.7500)	(0.2648)	(−2.7690)
Roe	−0.8358	0.5195	−0.6423	0.6599
	(−0.3151)	(0.2254)	(−0.2462)	(0.2827)
Turnover	0.6413	0.6625	0.6041	0.6577
	(0.7292)	(1.1474)	(0.6799)	(1.1349)
Ret	0.7286	0.5543*	0.7333	0.5474*
	(0.9595)	(1.8209)	(0.9989)	(1.7955)
Tq	−0.4964	−0.0035	−0.6153	0.0162
	(−1.0781)	(−0.0123)	(−1.3748)	(0.0569)
Constant	−41.4461***	−36.1312***	−41.8902***	−36.0856***
	(−2.7524)	(−4.1381)	(−2.7853)	(−4.1284)
Year&Ind&Pro	Yes	Yes	Yes	Yes
Observations	1102	5002	1129	4975
R-squared	0.528	0.407	0.523	0.408
Chi2	1.65(0.1992)		1.32(0.2505)	

This table presents the effect of D&O insurance on CSR performance based on the legal risk faced by the company. The dependent variable *Rks* is the firm's CSR score rated by Rankins Global (RKS) on the disclosure and performance of social responsibilities. *Insured* equals 1 if the firm has purchased D&O insurance in the year, and 0 otherwise. Definitions of other variables are presented in Appendix A. Column (1) and (2) show the results when the number of lawsuits filed against the company is high and low, respectively. Column (3) shows the result for the firms facing a major lawsuit and Column (4) shows the result for firms without major lawsuit. Year, industry, and province fixed effects are controlled in all specifications. T-statistics are in parentheses with standard errors clustered at the firm level. ***, **, and * indicate 1%, 5%, and 10% significance levels, respectively.

5. Robustness check

5.1. Endogeneity issues

Several rounds of robustness tests further verify our main result. Column (1) of Table 9 shows the regression result with a fixed effect at the firm level instead of the industry and province levels before. Column (4) shows the regression result based on the propensity score matching method. The treatment firms are those with D&O insurance coverage and the control firms are filtered through 1-to-1 match on the dimensions of size, leverage, *etc.* Please see Appendix B for the details of the propensity score matching. Column (5) and (6) shows the results from Heckman two-stage analysis. Since many companies miss CSR reports for certain years, it may cause sample bias based on missing dependent variables. In the first stage, a Probit estimation is conducted using independent variables and controlled variables to predict whether CSR reports are disclosed, and the estimated inverse Mills ratio (IMR) is used to correct sample bias in the second-stage regression. Our main result stays robust.

We also fully recognize that the reverse causality between D&O insurance and CSR could exist in our study. The positive association of the two factors may be due to the fact that firms with better CSR disclosure are more willing to purchase D&O insurance, instead of that D&O insurance promotes CSR. To address this issue, we select an instrumental variable that is closely related to D&O insurance coverage but is unrelated with CSR and then run two-stage least square (2SLS) regression

Table 8
The effect of CSR performance on economic performance by D&O insurance coverage.

Variables	(1)	(2)	(3)	(4)	(5)	(6)
	ΔRoa	ΔRoa	ΔRoa	ΔRoe	ΔRoe	ΔRoe
	(Insured = 1)	(Insured = 0)		(Insured = 1)	(Insured = 0)	
Rks_high	0.0095***	−0.0010	−0.0009	0.0226***	−0.0016	−0.0010
	(3.3714)	(−1.1111)	(−0.9575)	(3.6574)	(−0.8543)	(−0.5534)
Insured			−0.0036			−0.0078*
			(−1.6227)			(−1.7424)
*Rks_high * Insured*			0.0070***			0.0141***
			(2.7471)			(2.6255)
Size	−0.0019	−0.0023***	−0.0024***	−0.0070*	−0.0046***	−0.0046***
	(−1.0153)	(−4.2015)	(−4.4421)	(−1.6758)	(−4.0601)	(−4.2985)
Lev	0.0255**	0.0208***	0.0211***	0.0304	0.0233***	0.0224***
	(2.1290)	(5.6499)	(6.1226)	(1.1942)	(3.1914)	(3.2268)
Dirnum	−0.0006	−0.0001	−0.0002	−0.0014	−0.0002	−0.0003
	(−0.8254)	(−0.4929)	(−0.7648)	(−0.8979)	(−0.3327)	(−0.6242)
Outdir	−0.0077	−0.0181*	−0.0177*	−0.0138	−0.0361*	−0.0360*
	(−0.2567)	(−1.7527)	(−1.8589)	(−0.2350)	(−1.6691)	(−1.8038)
Separate	0.0003	−0.0001	−0.0000	0.0005	−0.0000	−0.0000
	(1.3117)	(−0.9770)	(−0.6944)	(1.1087)	(−0.3628)	(−0.2331)
Lsh	−0.0001	0.0001	0.0000	−0.0003	0.0001*	0.0001
	(−1.4183)	(1.5897)	(1.4067)	(−1.4372)	(1.6509)	(1.5408)
Dual	0.0041	−0.0009	−0.0009	0.0060	−0.0019	−0.0019
	(0.8029)	(−0.6726)	(−0.6926)	(0.5590)	(−0.7386)	(−0.7753)
Cf	0.0787***	0.0754***	0.0743***	0.2258***	0.1272***	0.1322***
	(3.4550)	(8.8149)	(9.3507)	(4.2927)	(6.9649)	(7.7471)
Cash	−0.0320	0.0030	0.0015	−0.0537	0.0077	0.0032
	(−1.4652)	(0.6087)	(0.3136)	(−1.0295)	(0.7775)	(0.3320)
Inst	−0.0004	0.0044*	0.0043*	−0.0035	0.0058	0.0054
	(−0.0417)	(1.8209)	(1.8742)	(−0.2243)	(1.1496)	(1.1579)
Big4	0.0012	0.0023	0.0022*	0.0033	0.0073**	0.0055**
	(0.4119)	(1.5453)	(1.7829)	(0.5273)	(2.2821)	(2.1595)
Age	−0.0048	0.0009	0.0006	−0.0114	−0.0023	−0.0031
	(−1.0616)	(0.5520)	(0.3497)	(−0.9934)	(−0.7118)	(−1.0419)
Roe	−0.0041	−0.0128**	−0.0123***	−0.0894**	−0.0429***	−0.0474***
	(−0.3368)	(−2.5445)	(−2.5993)	(−2.2542)	(−3.8009)	(−4.4741)
Turnover	0.0023	−0.0003	0.0000	0.0081	−0.0012	−0.0002
	(0.9876)	(−0.2783)	(0.0324)	(1.2893)	(−0.4800)	(−0.0728)
Ret	0.0087**	0.0195***	0.0183***	0.0262***	0.0376***	0.0363***
	(2.0585)	(14.7913)	(14.8261)	(2.8041)	(13.9585)	(14.1726)
Tq	0.0007	−0.0022***	−0.0020***	−0.0005	−0.0040***	−0.0037***
	(0.3148)	(−3.1189)	(−3.0124)	(−0.0978)	(−3.2772)	(−3.2010)
Constant	−0.0248	0.0353**	0.0351**	0.1015	0.0940***	0.0945***
	(−0.5886)	(2.4011)	(2.5069)	(1.0200)	(3.2204)	(3.4292)
Year&Ind&Pro	Yes	Yes	Yes	Yes	Yes	Yes
Observations	741	5363	6104	741	5363	6104
R-squared	0.209	0.129	0.126	0.206	0.116	0.114
Chi2	10.57***			12.03***		

model for the main test.

The instrumental variable we use for the 2SLS is the industrial level of D&O insurance coverage (Ave Insu Time), measured as the average number of years of D&O insurance coverage for all the firms in the same industry in the same year. Such industrial climate for insurance is more likely to affect an individual firm's choice of insurance policy, but is highly unlikely to affect the firm's performance in CSR. Table 9 Column (2) shows that the coefficient of *Ave Insu Time*, as we expected, is positive and significant at the 1% level in explaining D&O Insured. Based on the first-stage model in Column (2), we predict D&O insurance coverage ($D\&O\widehat{Insured}$) and use it as the key test variable in the second-stage of CSR determination. In Columns (3), the coefficients of $D\&O\widehat{Insured}$ remain negative and significant at the 5% level. Hence, the findings in Table 2 stay robust after accounting for the endogeneity issue of reverse causality.

5.2. Various metrics for CSR

We also use other metrics to measure CSR performance. In Table 10 Column 1, the dependent variable is the dummy variable Rks_D to indicate whether CSR reports are disclosed. In Column 2–4 we use separate regression models for estimation: OLS, FE, and Tobit (left-censored at 0). In Column 5–8, the dependent variable is replaced with CSR report sub-scores (comprehensiveness (M)), technicality (T), and industry specificity (I)) (Rks_M, Rks_C, Rks_T, Rks_I). Moreover, we calculate CSR performance quantitively based on the formula of CSR = (cash paid for dividends or profits + operating expenses + cash paid for interest + cash paid to and for employees + cash paid for goods and services + actual payment of taxes) / net revenue. This CSR variable is constructed based on the cash spending on all related stakeholders including the shareholders. In Column 10, we use another ranking agency's data called Syntao Green Finance ESG rating for CSR measurement. The main results remain significant.

6. Conclusion

This research shows that companies with D&O insurance tend to perform better in terms of corporate social responsibility related activities. The positive effect of D&O insurance on CSR is particularly strong when the insurance industry is more active, and internal and external corporate governance measures are weaker. Additionally, when D&O insurance is present, CSR activities can have a more positive impact on a firm's operating performance. Our findings suggest that D&O insurance

Table 9
Robustness check for the effect of D&O insurance on CSR performance.

Variables	(1)	(2)	(3)	(4)	(5)	(6)
	Rks	Insured	Rks	Rks	Rks_D	Rks
	FE	IV-first stage	IV-second stage	PSM	Heckman-first stage	Heckman-second stage
Insured	3.2154***	0.0227**		2.6945**	3.8112***	0.2241***
	(3.1029)	(2.5792)		(2.2209)	(7.4910)	(4.9448)
Insured_IV			9.5517**			
			(2.1238)			
Size	1.3710***	−0.0066	1.4202***	4.8033***	6.7129***	0.6184***
	(3.0607)	(−0.5232)	(3.0919)	(6.0409)	(14.9377)	(44.1664)
Lev	0.5775	−0.0301	0.7498	1.8059	−5.9192***	−0.6954***
	(0.3697)	(−0.6353)	(0.4733)	(0.4512)	(−5.2240)	(−9.4084)
Dirnum	0.1641	0.0026	0.1481	0.5096	0.6914***	0.0444***
	(1.1682)	(0.6969)	(1.0326)	(1.3880)	(7.5347)	(6.2237)
Outdir	−0.0778	−0.0488	0.2486	−11.9852	4.3415	0.7804***
	(−0.0191)	(−0.5200)	(0.0598)	(−1.1095)	(1.5075)	(3.4641)
Separate	0.0009	−0.0021**	0.0138	−0.1251	−0.0168	0.0016
	(0.0375)	(−2.5734)	(0.5451)	(−1.5822)	(−0.9357)	(1.1544)
Lsh	0.0104	0.0015*	0.0006	0.0184	−0.0052	−0.0046***
	(0.4925)	(1.9030)	(0.0270)	(0.3647)	(−0.4767)	(−5.8596)
Dual	−0.5394	−0.0105	−0.4718	0.7507	−1.2871***	−0.0763***
	(−1.3211)	(−0.7394)	(−1.1587)	(0.5785)	(−3.3782)	(−2.8066)
Cf	2.3800	0.0105	2.3104	7.1686	8.9064***	0.6503***
	(1.5519)	(0.2846)	(1.4982)	(0.9530)	(3.8951)	(3.9418)
Cash	0.0952	0.0449	−0.2054	12.2749*	0.7388	−0.1520
	(0.0540)	(1.1869)	(−0.1165)	(1.6528)	(0.5064)	(−1.4587)
Inst	0.7927	0.0249	0.6223	−0.6365	5.4851***	0.7794***
	(1.1117)	(1.2893)	(0.8453)	(−0.2385)	(5.9062)	(14.2519)
Big4	2.7545**	0.0264	2.6065**	3.8812**	4.3881***	0.2344***
	(2.5669)	(0.5082)	(2.5546)	(2.4464)	(8.7103)	(4.9521)
Age	−1.6421	0.0390	−1.9269	−1.1538	−0.8772*	0.1675***
	(−0.6512)	(0.4355)	(−0.7494)	(−0.4368)	(−1.6625)	(4.6006)
Roe	1.9459*	0.0213	1.7893	−0.3744	2.7692*	0.3675***
	(1.8133)	(0.7616)	(1.6308)	(−0.0915)	(1.8666)	(3.4851)
Turnover	0.0329	−0.0108	0.1056	0.1953	0.2225	−0.0926***
	(0.0927)	(−1.1123)	(0.2898)	(0.1860)	(0.7301)	(−4.3063)
Ret	0.1381	0.0107*	0.0675	−0.1399	−0.5351	−0.1880***
	(0.7215)	(1.9137)	(0.3437)	(−0.2150)	(−1.3329)	(−6.5204)
Tq	−0.1541	−0.0062	−0.1102	1.4300*	0.4679***	0.0949***
	(−0.9741)	(−1.5892)	(−0.6776)	(1.9099)	(2.6833)	(8.0793)
Lambda						10.3386***
						(8.9581)
Constant	−0.6827	−0.0062	−0.1102	−84.6380***	−137.6362***	−15.1910***
	(−0.0579)	(−1.5892)	(−0.6776)	(−3.9266)	(−11.3166)	(−45.0396)
Year&Ind&Pro				Yes	Yes	Yes
Year&Firm	Yes	Yes	Yes			
Observations	6104	6104	5996	1482	22,186	22,186
R-squared	0.378	0.066	0.361	0.493		
Number of Firms	909	909	801			
Underidentification test			31.2			
p-value			2.33E-08			
Weak identification test			29.34			

This table shows the effect of D&O insurance on CSR performance in various specifications. The dependent variable *Rks* is the firm's CSR score rated by Rankins Global (RKS). *Insured* equals 1 if the firm has purchased D&O insurance in the year, and 0 otherwise. Definitions of other variables are presented in Appendix A. Firm, year, industry, and province fixed effects are included in Column (1). The result from two-stage-least-square regression is in Column (2) and (3). The instrumental variable in such analysis is the average D&O insurance coverage of the sample firm's industry. The result based on propensity score matching is in Column (4). The results of the first stage and the second stage of the Heckman test are presented in Column (5) and (6) respectively. T-statistics are in parentheses with standard errors clustered at the firm level. ***, **, and * indicate 1%, 5%, and 10% significance levels, respectively.

can be beneficially aligned with shareholders' interests in promoting CSR.

Our study is the first to establish a link between D&O insurance and CSR performance. We demonstrate that D&O insurance can enhance a company's CSR performance through improved governance, providing a new determinant of CSR performance in addition to financial and corporate factors. While CSR is important for the sustainability of society, the inclusion of D&O insurance can protect managers from risks associated with pursuing CSR goals and facilitate better governance on managers, ultimately reducing legal costs resulting from CSR failures.

Furthermore, our research contributes to the ongoing debate regarding the role of D&O insurance. The literature contains two opposing views, with one suggesting that insurance can play a governance role and have a positive impact on governance, while the other emphasizes the moral hazard effect of insurance and its adverse impact on governance. Our results support the former perspective, in the sense that the purchase of insurance is determined by shareholders, rather than the managers who are to be covered by it.

While the D&O insurance industry has extended its coverage to more countries,[4] our research findings, based on the Chinese D&O insurance

[4] According to the Directors and Officers Insurance Insights & Reports 2022 by Allianz Commercial Co., there has been a significant surge in D&O insurance premiums in major global markets during 2021, showing double-digit increases.

Table 10
D&O insurance and CSR performance measured with alternative metrics.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Rks_D	Rks_rob	Rks_rob	Rks_rob	Rks_M	Rks_C	Rks_T	Rks_I	Csr	Esg
	Probit	Ols	FE	Tobit						
Insured	0.2241**	5.0798***	4.6491***	6.4198***	0.6853*	1.6606***	0.3079**	0.4117***	0.0273*	0.2942***
	(2.1558)	(3.9633)	(3.7818)	(4.7408)	(1.7357)	(3.1373)	(1.9685)	(3.3134)	(1.6543)	(3.6161)
Size	0.6184***	7.3872***	3.0743***	20.8051***	0.9939***	1.4473***	0.4200***	0.2923***	0.0199***	0.0905**
	(17.9441)	(22.0645)	(8.1017)	(46.0149)	(7.6193)	(8.2717)	(8.0000)	(7.5654)	(3.4772)	(2.4682)
Lev	−0.6954***	−6.6871***	−3.1074***	−22.4316***	−0.5085	−1.1038	−0.2910	−0.0250	0.0467	0.0341
	(−4.4209)	(−4.7702)	(−2.6793)	(−9.0968)	(−0.6853)	(−1.1237)	(−0.9945)	(−0.1159)	(1.2216)	(0.1718)
Dirnum	0.0444***	0.6333***	−0.1148	1.5932***	0.1642***	0.2050**	0.0699***	0.0353*	−0.0032	0.0270
	(2.7293)	(3.5758)	(−0.7939)	(7.0139)	(2.6920)	(2.4626)	(2.7877)	(1.8417)	(−0.9328)	(1.6250)
Outdir	0.7804*	12.3265***	−1.4865	22.0942***	0.9391	0.2452	0.3723	0.1778	0.0209	1.1382**
	(1.6656)	(2.6235)	(−0.4291)	(3.0269)	(0.5309)	(0.0994)	(0.4913)	(0.3166)	(0.2395)	(2.3645)
Separate	0.0016	−0.0160	0.0010	0.0909**	−0.0190	−0.0083	−0.0091*	−0.0020	0.0010	0.0001
	(0.4877)	(−0.4764)	(0.0402)	(2.0175)	(−1.4183)	(−0.4750)	(−1.7486)	(−0.5653)	(1.5733)	(0.0165)
Lsh	−0.0046**	−0.0155	−0.0068	−0.1374***	0.0076	0.0085	0.0012	0.0005	0.0009**	0.0033*
	(−2.5356)	(−0.8662)	(−0.3366)	(−5.2938)	(1.0794)	(0.8094)	(0.4111)	(0.2340)	(2.1737)	(1.7427)
Dual	−0.0763	−0.4991	−0.2854	−3.2730***	−0.1763	−0.4162	−0.0995	−0.1683***	0.0096	−0.2450***
	(−1.4301)	(−1.0761)	(−0.8829)	(−3.5819)	(−0.8780)	(−1.4894)	(−1.3250)	(−2.8934)	(0.8352)	(−3.9437)
Cf	0.6503***	5.6284**	1.8680	23.2956***	1.1924	3.3129**	0.9569**	0.8095**	−1.2083***	0.1357
	(2.7004)	(2.5130)	(1.5844)	(4.2117)	(1.1082)	(2.1829)	(2.1821)	(2.3893)	(−14.4464)	(0.3859)
Cash	−0.1520	−0.1719	1.1865	−2.9224	0.3936	0.5284	0.1772	0.2857	0.1969***	0.1806
	(−0.7699)	(−0.0987)	(1.0511)	(−0.8400)	(0.4159)	(0.4037)	(0.4711)	(0.9630)	(4.2076)	(0.6911)
Inst	0.7794***	6.8493***	1.6857**	27.0315***	−0.1671	0.7117	−0.0019	0.1972	0.0228	−0.1433
	(7.9534)	(6.3756)	(2.5600)	(14.8764)	(−0.3743)	(1.1587)	(−0.0104)	(1.4109)	(1.0686)	(−1.2537)
Big4	0.2344**	7.4953***	2.9361**	5.4891***	1.0447**	1.8481***	0.5715***	0.3934***	0.0341**	0.3204***
	(2.1741)	(4.9890)	(2.2943)	(3.9712)	(2.3891)	(3.1053)	(3.0067)	(3.1388)	(1.9680)	(3.7284)
Age	0.1675*	0.9971	−1.5752	5.8008***	−0.8079**	−1.1997**	−0.4510***	−0.2956***	0.0288	0.1271
	(1.8750)	(1.2231)	(−0.7780)	(4.7988)	(−2.1129)	(−2.3112)	(−2.8311)	(−2.8233)	(1.5787)	(1.2004)
Roe	0.3675**	1.8472	−0.2511	13.2556***	−0.9026	0.6389	−0.0987	−0.0202	−0.1543***	0.0216
	(2.5459)	(1.6145)	(−0.3733)	(3.7489)	(−1.2929)	(0.6824)	(−0.3773)	(−0.0920)	(−3.6356)	(0.1390)
Turnover	−0.0926**	−0.8715**	−1.2090***	−2.5085***	0.2095	0.4047	0.0036	0.1130*	−0.0087	−0.1108*
	(−2.1986)	(−2.1514)	(−3.6771)	(−3.4976)	(1.1442)	(1.5718)	(0.0488)	(1.9131)	(−0.9066)	(−1.7349)
Ret	−0.1880***	−1.6030***	−0.4756***	−5.5901***	0.1030	0.3583**	0.0483	0.0889**	−0.0203***	0.1099**
	(−7.1267)	(−7.0877)	(−2.7859)	(−5.9281)	(0.9721)	(2.4510)	(0.9226)	(2.1865)	(−2.6985)	(2.5431)
Tq	0.0949***	1.3784***	0.0065	2.7743***	0.1167	−0.1612	0.0422	−0.0231	0.0179***	−0.0018
	(4.0183)	(6.8128)	(0.0509)	(7.0399)	(1.2933)	(−1.2881)	(1.1956)	(−0.7942)	(3.2328)	(−0.1037)
Constant	−15.1910***	−165.0559***	−56.1699***	−512.9911***	−10.5170***	−15.0081***	−2.9603**	−6.2916***	0.5683***	0.0212
	(−17.8956)	(−21.1083)	(−5.8061)	(−45.9657)	(−3.4649)	(−3.7308)	(−2.5736)	(−7.2268)	(4.1152)	(0.0234)
Year&Ind&Pro	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year&Firm			Yes							
Observations	22,110	22,186	22,186	22,186	5616	5615	5615	5604	6104	2820
R-squared	0.2784	0.358	0.149		0.385	0.353	0.450	0.427	0.343	0.274
Number of Firms			3190							

This table shows the effect of D&O insurance on CSR performance measured in other variables. The definitions of these variables are presented in Appendix A. Column (1) presents the result from Profit regression with the dependent variable as a dummy for CSR score reporting. Column (2) and (4) present the results from OLS and Tobit estimation with the dependent variable as the CSR score. Column (3) present the result with a fixed effect at the firm-year level, while the year, industry, and province fixed effects are included in all other columns. The results in Column 5–10 are from OLS estimation. T-statistics are in parentheses with standard errors clustered at the firm level. ***, **, and * indicate 1%, 5%, and 10% significance levels, respectively.

market, have significant implications for other economies, particularly those with weaker legal and institutional frameworks. Shareholders of companies with poor governance can leverage D&O insurance to enhance performance across various domains, including Corporate Social Responsibility (CSR) initiatives. It's crucial to acknowledge that D&O insurance is a double-edged sword. While it can promote better corporate governance, it may also incentivize managerial risk-taking behaviors. Therefore, the decision to purchase D&O insurance should involve all shareholders, not just managers or controlling shareholders, as is the case in the Chinese market. This approach ensures a stronger alignment of interests between shareholders and D&O insurance providers.

Data availability

Data are obtained through paid subscription of various databases.

Appendix A. Variable definitions

Variable name	Variable definition
Rks	Rankins CSR Score
Rks_high	A dummy variable that equals 1 if RKS is above the median and 0 if below
ΔRoa	The change of return on assets from year t-1to year t
ΔRoe	The change of return on equity from year t-1to year t
Rks_D	A dummy variable that equals 1 if CSR is reported in Rankins and 0 otherwise
Rks_rob	CSR score for the company
Rks_M	CSR overall score
Rks_C	CSR score based on content
Rks_I	CSR score based on industry
Rks_T	CSR score based on technology
Csr	Cash paid to shareholders, creditors, employees, suppliers, and government scaled by net revenue
Esg	ESG score by SynTao Green Finance
Insured	A dummy variable that equals 1 if the company's managers are covered by Directors' and Officers' Liability Insurance and 0 otherwise
InsPre/GDP	Total insurance premium income scaled by the GDP at the province level
InsuNum	The number of insurance companies within a 50 km radius of the firm's headquarter
SthInscomp	Percentage ownership by insurance companies
InsuLen	The number of years a firm has purchased D&O insurance
Fee	The ratio of expenses incurred by managers
AuditFee	Auditing fee scaled by total revenue
Insthold	Percentage ownership by institutional investors excluding insurance companies
LegalEnv	The score of economic marketizations for the province of the firm
Export	A dummy that equals 1 if the firm receives income from exporting and 0 otherwise
Crosslist	A dummy that equals 1 if the firm is cross listed overseas
Voluntary	A dummy that equals 1 if the CSR disclosure is voluntary and 0 if mandatory
Reputation	A dummy that equals 1 if the CEO is covered by negative news and 0 otherwise
Size	The natural logarithm of total assets
Lev	Total liabilities scaled by total assets
Dirnum	Number of board members
Outdir	The ratio of independent directors in the board
Separate	Ultimate controlling right minus cash claim right
Lsh	The ownership percentage of the largest shareholder
Dual	Equals 1 if the CEO is the firm's chairperson at the same time, and 0 otherwise
Cf	Operating cash flows divided by total assets
Cash	Cash and equivalents divided by total assets
Inst	Percentage ownership by institutional investors
Big4	A dummy that equals 1 if the auditor is a Big Four accounting firm and 0 otherwise
Age	The natural logarithm of the current year minus the IPO year
Roe	Return on Equities
Turnover	Revenue divided by total assets
Ret	Stock return of the year including dividends
Tq	The market value of a company divided by its assets' replacement cost

Appendix B. Propensity score analysis for the correction of selection bias

Panel A. Balance test: Mean comparison of covariates before matching

Variable	Treated	Controls	Difference	S.E.	T-stat
Size	24.088	22.870	1.218	0.053	23.15***
Lev	0.567	0.477	0.090	0.008	11.67***
Dirnum	9.833	9.106	0.727	0.075	9.72***
Outdir	0.375	0.374	0.001	0.002	0.43
Separate	4.949	5.562	−0.612	0.327	−1.87**
Lsh	40.535	37.578	2.957	0.626	4.73***
Dual	0.082	0.183	−0.101	0.015	−6.83***
Cf	0.057	0.053	0.004	0.003	1.47
Cash	0.125	0.153	−0.027	0.004	−6.35***
Inst	0.441	0.407	0.034	0.009	3.80***
Big4	0.478	0.109	0.368	0.014	27.04***

(*continued on next page*)

(*continued*)

Panel A. Balance test: Mean comparison of covariates before matching					
Variable	Treated	Controls	Difference	S.E.	T-stat
Age	2.893	2.808	0.084	0.013	6.30***
Roe	0.081	0.083	−0.002	0.004	−0.46
Turnover	0.766	0.778	−0.012	0.023	−0.52
Ret	0.075	0.098	−0.023	0.022	−1.06
Tq	1.400	1.909	−0.509	0.044	−11.44***
Panel B. Balance test: Mean comparison of covariates after matching					
Variable	Treated	Controls	Difference	S.E.	T-stat
Size	24.088	24.032	0.056	0.071	0.79
Lev	0.567	0.556	0.011	0.009	1.16
Dirnum	9.833	9.667	0.166	0.111	1.49
Outdir	0.375	0.374	0.001	0.003	0.34
Separate	4.949	4.662	0.288	0.419	0.69
Lsh	40.535	41.319	−0.784	0.850	−0.92
Dual	0.082	0.088	−0.005	0.014	−0.37
Cf	0.057	0.059	−0.002	0.003	−0.59
Cash	0.125	0.123	0.002	0.005	0.44
Inst	0.441	0.447	−0.006	0.011	−0.49
Big4	0.478	0.449	0.028	0.026	1.09
Age	2.893	2.868	0.025	0.018	1.40
Roe	0.081	0.080	0.001	0.006	0.23
Turnover	0.766	0.764	0.003	0.032	0.09
Ret	0.075	0.093	−0.019	0.028	−0.68
Tq	1.400	1.420	−0.020	0.036	−0.57

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