The Journal of Risk and Insurance

© 2016 The Journal of Risk and Insurance. Vol. 85, No. 4, 1013–1054 (2018).
DOI: 10.1111/jori.12193

Directors' and Officers' Liability Insurance, Independent Director Behavior, and Governance Effect

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Abstract

We examine the effect of directors' and officers' liability insurance (D&O insurance) on the behavior of independent directors and the effectiveness of their governance role. Using a unique data set, we find a negative relation between D&O insurance and personal board meeting attendance by independent directors and a positive relation between D&O insurance and meeting attendance by authorized representatives. Content analysis of independent director opinion reports indicates that D&O insurance encourages independent directors to behave less responsibly. Insured independent directors are also more likely to be busy. Collectively, D&O insurance reduces the effectiveness of independent directors in corporate governance.

Introduction

Directors' and officers' liability insurance (D&O insurance) is a liability cover for company directors and managers to protect them from claims that may arise from the decisions and actions taken within the scope of their regular duties. D&O insurance is now a common part of corporate risk management in North America and Europe, and is becoming popular in emerging economies as well. Despite increasing prevalence, there is an ongoing debate about the merits of D&O insurance, especially

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its role in corporate governance. One view is that because D&O insurance shields directors and officers from litigation risk and personal financial liability, it could undermine corporate governance in that directors may reduce their monitoring efforts and managers may pursue personal interests at the expense of shareholders (Chung and Wynn, 2008). An opposite view is that D&O insurance is beneficial to corporate governance because it allows competent professionals to serve as monitors of companies without fear of personal financial loss (Core, 1997). Moreover, scrutiny of a firm's corporate governance by insurance companies before and after D&O insurance purchase provides monitoring of directors and managers, and forces them to engage in responsible conduct and deter wrong doings (O'Sullivan, 1997; Core, 2000; Boyer and Stern, 2014).

There is a growing literature on the governance effect of D&O insurance, but the evidence remains inconclusive. One stream of studies show that a higher level of D&O insurance coverage is associated with greater financial reporting aggressiveness (Chung and Wynn, 2008; Kim, 2015), higher cost of equity (Chen, Li, and Zou, 2016), higher loan spreads (Lin et al., 2013), greater risk taking (Boyer and Tennyson, 2015), overinvestment (Li and Liao, 2014), a higher likelihood of lawsuits (Gillan and Panasian, 2015), greater tax avoidance (Zeng, 2014), lower analyst forecast optimism (Boubakri and Bouslimi, 2016), higher audit fees (O'Sullivan, 2009; Chung, Hillegeist, and Wynn, 2015), and poorer post-IPO stock performance (Chalmers, Dann, and Harford, 2002; Boyer and Stern, 2014). In mergers and acquisitions (M&As) settings, a higher level of D&O insurance coverage has been found to be associated with lower announcement-period abnormal stock returns of acquirers (Lin, Officer, and Zou, 2011) and a lower bid premium (Aguir et al., 2013). Collectively these evidence support the view of negative governance effects of D&O insurance. In contrast, O'Sullivan (1997) finds that D&O insurance reduces agency costs and improves corporate governance. Donley and Kent (2008) conclude that D&O liability insurance has become an integral part of corporate governance in Canada. Yuan, Sun, and Cao (2016) find evidence that D&O insurance in China is effective in reducing the stock price crash risk.

A potential limitation of these prior studies is that they draw inferences on the governance implications of D&O insurance based on *indirect* evidence (e.g., how D&O insurance coverage is perceived by corporate stakeholders, or affects firm performance). A more direct approach would be to examine how D&O insurance actually affects the *personal behavior* of managers and directors, who are the main beneficiaries of such insurance. In this study, we provide *direct* evidence on how D&O insurance coverage affects the actions of independent directors—a major class of beneficiaries of this insurance.

As first line of defense for minority shareholders, independent directors are a critical element of a firm's corporate governance system. As they do not work in the company on a daily basis, the main channel through which they devote effort to the company and carry out their governance responsibilities is through the attendance of board meetings and issuing opinions on key corporate decisions (Adams and Ferreira, 2008). However, a common challenge facing board-related research is that director behavior is rarely observable by outsiders (Adams, Hermalin, and Weisbach, 2010; Adams, Lin, and Zou, 2011). As a result, the empirical literature has not advanced

much beyond surveying the impact of board composition on observable corporate outcomes such as firm performance (Bebchuk and Cohen, 2005), prevention of accounting fraud (Beasley, 1996; Klein, 2002), and decisions on executive compensation and turnover (Weisbach, 1988). Only several studies have attempted to "look inside the boardroom" to better understand the inner dynamics of boards.[1]

In this article, we are able to take a closer look at the impact of D&O insurance on the behavior of independent directors by taking advantage of China's regulatory setting that requires public companies to disclose every independent director's board meeting attendance records and opinions on key corporate matters. This research setting offers several distinct advantages. First, unlike the United States where researchers are only able to observe board meeting attendance at the 75 percent threshold, we are able to obtain data on the exact attendance rate for every director. Second, U.S. corporations only disclose meeting attendance in a binary form—either attendance or absence—whereas Chinese corporations disclose the specific type of attendance—personal attendance, attendance by representatives appointed by the independent director (proxy attendance), and absence. Distinguishing between personal attendance and proxy attendance is important as Chou, Chung, and Yin (2013) find personal board meeting attendance enhances firm performance, while proxy attendance has an adverse performance implication. Third, U.S. firms do not disclose independent directors' opinions. In contrast, the Chinese Securities and Regulatory Commission (CSRC) mandates that independent directors of listed companies publicly issue opinion reports on major corporate events, including the appointment and dismissal of senior managers, material intercorporate loans to shareholders, and other events that independent directors consider to be detrimental to the interests of minority shareholders (Tang, Du, and Hou, 2013).[2]

Detailed quantitative and qualitative director behavioral data disclosed by public Chinese companies therefore provide us a rare opportunity to observe the behavior of independent directors and assess the impact of D&O insurance coverage on their effort level. Specifically, we examine three measures of a director's expenditure of effort—board meeting attendance, diligence level as reflected in independent director opinion reports, and busyness.

The first measure of director effort that we examine is board meeting attendance. Based on a sample of Chinese firms between 2004 and 2012 and a matched-pair design

[1]Adams and Ferreira (2008) study board meeting attendance and its association with director compensation using a sample of U.S. firms. Schwartz-Ziv and Weisbach (2013) analyze board meetings minutes of 11 Israeli government-owned companies and find that boards spend most of their time supervising management rather than dictating how the company should be run.

[2]Each opinion report generally contains a description of the subject matter and the associated independent directors' opinions. However, those reports vary significantly in additional qualitative information disclosed, including how independent directors formed their opinions, and/or any actions they have taken about the subject matter. Information disclosed in the opinion reports are perceived to be objective and credible as these reports are subject to review by the CSRC and other relevant regulatory bodies, and independent directors are held accountable for the content.

using the propensity score matching method, we document a significantly negative relation between D&O insurance coverage and personal meeting attendance by independent directors and a significantly positive relation between D&O insurance coverage and proxy attendance as well as attendance problem. These findings suggest that insured independent directors personally attend fewer meetings; instead, they tend to delegate board duties to authorized representatives or miss board meetings.

We next exploit qualitative information in independent directors' opinion reports to gauge how responsible they are in carrying out their fiduciary duties. Following the method of Loughran and McDonald (2011), we analyze the content of a large sample of opinion reports in a systematic fashion and transform qualitative statements that reflect independent directors' diligence level into two quantitative measures, *DiligenceScore_prop* and *DiligenceScore_tf.idf*, where a higher score represents a higher level of effort. We find that D&O insurance coverage has a significant negative association with both diligence scores, implying that insured independent directors appear to be less diligent than their uninsured peers.

Our third measure of director effort is the degree of busyness. The issue of busy directors has received much attention in the corporate governance literature (Field, Lowry, and Mkrtchyan, 2013). Fich and Shivdasani (2006) and Core et al. (1999), among others, provide evidence suggesting that busy boards, where directors take on multiple directorships, may not effectively monitor management. We examine how D&O insurance coverage affects independent directors' inclination to take on additional directorships at other firms. In particular, if D&O insurance coverage reduces an independent director's effort level at the incumbent firm, he/she may have more time and energy to take on additional directorships. Consistent with this conjecture, we find that D&O insurance coverage is associated with a higher probability of busy board.

To corroborate our findings and to alleviate the concern that our results are driven by differences in board composition between firms with and without D&O insurance coverage, we collect information on individual director characteristics and repeat all analyses at the directorship level. Our results remain robust.

To further address the self-selection concern and also in an attempt to establish causality (i.e., how D&O insurance coverage *alters* independent director's behavior), we examine *changes* in independent directors' behavior surrounding *first-time purchase* of the D&O insurance. The results suggest that compared to their uninsured peers, insured independent directors exert a significantly lower level of effort in the post-D&O insurance coverage period.

If D&O insurance coverage reduces independent directors' effort level, we expect it to weaken their effectiveness in corporate governance. Specifically, we examine how D&O insurance coverage moderates the impact of independent directors on firm value as well as on the occurrence of regulatory violation. Empirical results show that while board independence is associated with a higher firm value and a lower probability of regulatory violation, the relations are significantly mitigated by D&O insurance. These findings provide additional support for our hypothesis that D&O insurance coverage introduces moral hazard into the boardroom.

Our study contributes to the growing literature on D&O insurance, and to the best of our knowledge is the first to conduct a direct assessment of how D&O insurance affects independent directors' effort level when exercising their governance role. Prior studies predominantly focus on how D&O insurance purchases affect firm transactions and outcomes such as IPOs (Chalmers, Dann, and Harford, 2002; Boyer, 2012; Boyer and Stern, 2014), M&As (Lin, Officer, and Zou, 2011; Aguir et al., 2013), financial reporting practicing (Boubakri, Ghalleb, and Boyer, 2008; Chung and Wynn, 2008), or how related stakeholders react to the insurance coverage announcement (Lin et al., 2013; Chen, Li, and Zou, 2016). In contrast, our study focuses on the direct impact of D&O insurance on its major beneficiary and provides evidence on at least one channel through which D&O insurance affects firm outcomes and governance quality.

Moreover, our study provides new insight into the effectiveness of D&O insurance as part of the corporate governance mechanisms in emerging countries. Prior studies largely examine Canadian firms due to D&O insurance data availability. However, it is not clear *ex ante* whether conclusions drawn from those studies can be generalized to emerging countries where institutional and legal environments are vastly different and the insurance markets are generally less developed. For example, Canada and United States follow common-law jurisdictions, with a relatively long history of D&O insurance, and firm ownership is diffused, whereas China is characterized by civil-law-based legal regime, a shorter history of D&O insurance, and a concentrated ownership of firms.[3] Therefore, whether D&O insurance has any significant impact on the corporate governance of Chinese companies is essentially an open, empirical question. Our empirical results suggest that in an emerging economy like China, D&O insurance coverage has real effect on public companies—it appears to impair the effort level of independent directors and has an adverse impact on the quality of a firm's internal corporate governance.

Our study also contributes to the emerging literature on the incentives of independent directors (Adams and Ferreira, 2008; Masulis and Mobbs, 2014). The governance role of outside directors has been of great interest to academics and industry practitioners. However, little is known about their incentives—what motivate or demotivate outside directors to spend time and effort on their governance task? Recent literature has begun to empirically examine this question and has identified monetary rewards (Adams and Ferriera, 2008), reputation concerns (Masulis and Mobbs, 2014), and director's own qualification (Chou, Chung, and Yin, 2013) as important determinants. Yet these only represent several components of a director's overall incentive. In this study, we examine the effect of personal liability exposure in disciplining independent directors and seek to understand whether hedging against personal litigation risk and wealth loss through D&O insurance deincentivizes directors to behave responsibly and diligently when carrying out their oversight role.

[3]Even within common-law jurisdictions, the corporate governance effect of D&O insurance may vary. Using a sample of U.S. cross-listed Canadian firms, Chung and Wynn (2008) find that the corporate governance implications of D&O insurance differ significantly across the two countries.

The remainder of the article proceeds as follows. The "Institutional Background" section provides institutional background. The "Data and Sample" section describes the data and presents descriptive statistics. The "Effect of D&O Insurance Coverage on Independent Director Behavior" section reports main empirical results. The "Additional Analyses" section presents results of additional analyses. The "Conclusion" section concludes the article.

INSTITUTIONAL BACKGROUND

Regulations of Independent Directorship in China

Over the course of China's capital markets development since 1991, corporate governance has been a central issue for listed Chinese companies that are often characterized by government ownership and a concentrated ownership structure. In the absence of proper governance mechanisms and regulations, managers and controlling shareholders have incentives to extract rents from the firm and its minority shareholders. Such agency conflict is further exacerbated by a split-share structure of nontradable shares held by controlling shareholders and tradable shares held by minority shareholders (Zou et al., 2008; Firth, Lin, and Zou, 2010).

To combat those corporate governance weaknesses and particularly to resolve conflicts of interests between controlling and minority shareholders, Chinese regulators borrowed Western governance practices that highlight the use of independent directors to represent the interests of minority shareholders and to prevent managerial opportunism. The CSRC subsequently issued several regulations that are intended to enhance the role of independent directors in corporate governance and the visibility of their monitoring efforts. "Guidelines for Establishing Independent Director System for Listed Companies" issued in August 2001 (CSRC No. 102) stipulates that independent directors should represent *at least* one-third of the board, of which at least one independent director must be an accounting professional. The regulation also stipulates that independent directors shall express unbiased opinions on major corporate events, including among others the nomination, appointment, and dismissal of directors; the appointment or dismissal of senior management; the remuneration of directors and senior management; material intercorporate loans to shareholders, controlling shareholders, and other affiliated entities; and other corporate events that independent directors consider detrimental to the interests of minority shareholders. This regulation was revised in 2004 to further encourage the issuance of unbiased independent director opinions. Specifically, it stipulates that "when one or more independent directors disagree on board proposals, the firm must disclose the name of the dissenting directors, titles of the proposals, and director's opinion." In addition to disclosure requirement on independent director opinion, the CSRC also promulgated the Code of Corporate Governance in 2002 that requires publicly listed companies to disclose detailed information on meeting attendance records of their independent directors.

Shareholder Litigation and the Development of D&O Insurance Market in China

As part of the effort to encourage director fiduciary responsibilities, Chinese regulations stipulate that directors can face personal litigation risk and financial

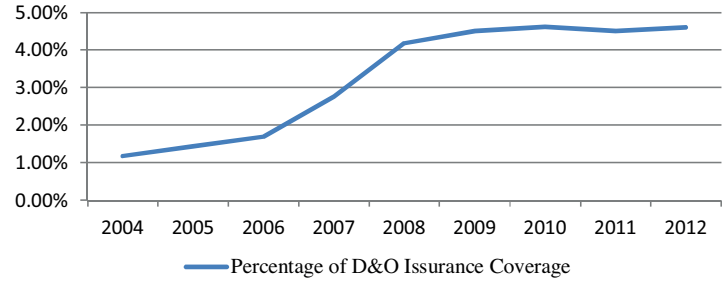
liability in the case of company misconduct. In the meantime, Chinese laws were designed to empower shareholders to take legal action against directors and managers. The most noticeable provision is "Some Provisions on Trying Cases of Supreme People's Court (SPC) on Civil Compensation Arising from False Statement in Securities Market" issued in 2003. It provides that "a case of civil compensation arising from false statement in securities market mentioned in the present provisions shall refer to a case of civil compensation for which an investor in securities market brings a lawsuit to the people's court against the obligor for information disclosure who violates legal provisions by making false statement and thus causing losses to him." For the first time, public investors are provided substance and procedures for seeking civil damages against directors and managers of a listed company that made false statements. Securities Law (revised in 2005) also stipulates that "where the prospectus, measures for financing through issuance of corporate bonds, financial statement, listing report, annual report, interim report, temporary report or any information as disclosed that has been announced by an issuer or a listed company has any false record, misleading statement or major omission, and thus incurs losses to investors in the process of securities trading, the issuer or the listed company shall be subject to the liabilities of compensation. Any director, senior manager or any other person of the issuer or the listed company directly responsible shall be subject to the joint and several liabilities of compensation, except for anyone who is able to prove his exemption of any fault." As a result, securities lawsuits in China were on the rise and company directors were finding themselves subject to greater exposure to personal legal and financial risks. Over the years, directors of a number of listed companies in China have been sued by investors for failure of oversight duties.[4] In the case of Daqing Lianyi Petro-Chemical Co., Ltd. (Ticker: 600065), the court ordered the company and its directors to pay over 8 million RMB to compensate investors for the loss.

In anticipation of increasing litigation risks, Article 39 of the Code of Corporate Governance sets forth that listed companies can purchase D&O insurance for their directors and officers. The first D&O policy in China was launched in 2002 through joint efforts by China's largest insurance company, China Ping An Insurance Co., Ltd., and Chubb Insurance Group. As a latecomer into China's financial markets, D&O insurance coverage is still in a nascent stage compared to Western countries. Approximately 5 percent of public companies in China are currently under coverage. Nevertheless, it is important to notice the growth trend as shown in Figure 1. The increasing breadth of coverage is attributed to at least three factors. First, China's overall insurance market has experienced a steady growth, especially in nonlife sectors.[5] Second, we have seen a global upsurge in class action lawsuits against corporate managers and directors in the

[4]Including Guangdong Yorkpoint Science and Technology Co., Ltd. (Ticker: 000008), Fujian Jiuzhou Group Co., Ltd. (Ticker: 000653), Shanghai Dongfang Electronics Co., Ltd. (Ticker: 000682), Chongqing Changjiang River Water Transport Co., Ltd. (Ticker: 600369), Guangdong Kelon Electrical Holdings Co., Ltd. (Ticker: 000921), Daqing Lianyi Petro-Chemical Co., Ltd. (Ticker: 600065).

[5]According to Swiss Re Sigma world insurance reports, China ranked 60th in 2013 on the global spectrum in terms of insurance density, up from 73th in 2002. http://www.swissre.com/sigma

FIGURE 1
D&O Insurance Purchase Trend



Note: This figure depicts the percentage of D&O insurance coverage among a sample of publicly traded Chinese firms between 2004 and 2012.

last decade. Increased director and manager responsibilities and lawsuit threat also led to greater demand for the D&O insurance. As China gradually integrates into the global economy and liberalizes its financial markets, changes in the global market climate and rising demand for the D&O insurance in other countries also substantially increased the awareness of this type of insurance among Chinese corporate managers. Third, there have been antecedents in China where insurance companies indemnified their clients who had purchased the D&O insurance. In 2011, GAC Changfeng Motor Co., Ltd. (Ticker: 600991) was sued by minority investors for financial fraud and the court ruled in favor of the 13 investor plaintiffs. AIG China, from whom GAC purchased the D&O insurance, paid for the penalty and compensation to investors. The fact that there are prior cases where D&O insurance covered the client's loss as a result of a legal action brought for alleged wrongful acts also increased the perceived benefits and demand for this product in China.

DATA AND SAMPLE

We use the China Stock Market & Accounting Research Database (CSMAR) database to identify publicly traded Chinese firms between 2004 and 2012.[6] We choose year 2004 as the beginning of our sample period because board meeting records and independent director opinion reports first appeared in CSMAR in that year. We obtain 11,618 firm-year observations that can be used for analyses of board meeting attendance and busyness.[7] As public companies are required to disclose information about the purchase of D&O insurance in board and shareholders' meeting minutes and annual reports, we manually searched through those documents to obtain data

[6]CSMAR is a leading database on Chinese publicly traded companies and is commonly used in Chinese capital market research.

[7]The initial sample includes 16,027 observations. We excluded 898 observations of companies listed on the growth enterprise board and 2,970 observations of companies listed on the small and medium-sized enterprise board. We further excluded 119 observations with missing financial data and 422 observations with missing corporate governance data, leading to a total of 11,618 observations.

on D&O coverage, and identified 371 observations with D&O insurance coverage. After excluding another 1,408 observations with missing independent director opinion reports, we obtained 10,210 firm-year observations that can be used for analysis of opinion reports. Among them, 303 observations are associated with D&O insurance coverage. Independent director behavioral data, financial statement information, board and director characteristics, and other corporate governance information are retrieved from CSMAR.

Table 1, Panel A reports the distribution of insured firms by year. Number of firms with D&O insurance coverage is on the rise during our sample period, from 14 in 2004 to 61 in 2012.[8] Panel B reports the sample distribution by industry where industry classification is based on the CSRC industry classification guide. Financial and insurance firms appear to constitute the largest sector of the sample, followed by firms in the transportation and warehousing sector and industrial machinery and equipment sector, respectively.[9]

Because the number of firms with D&O insurance coverage is substantially smaller compared to the number of uninsured firms, we chose to adopt a matched control sample method, which has been extensively used in the literature particularly when the size of an event sample is small (e.g., D'Mello and Shroff, 2000; Ferris et al., 2007; Zou et al., 2008). Our matching procedure relies on a nearest neighbor matching of propensity scores. The primary benefit of this approach is that it allows us to compare the D&O insured firms to a set of firms that are the same on all observable dimensions, thus allowing us to more clearly attribute any observed effects to D&O insurance purchase itself, rather than to firm characteristics associated with D&O insurance purchase (Bowen et al., 2010).[10] Specifically, we run a probit regression of a dummy variable that equals 1 if a particular firm-year observation belongs to our treatment group (i.e., with D&O insurance coverage) (and 0 otherwise) on a comprehensive list of observable firm characteristics as well as CSRC industry dummies to capture any industry-specific differences. We include the following firm characteristics: *Financial Institutions*, a dummy variable that equals 1 if the number of financial institutions in the region where the firm resides is greater than the national average.[11] The rationale behind this variable is that firms located in regions with more financial institutions may have a greater awareness of as well as exposure to D&O insurance. Therefore, we

[8]This is comparable with the summary statistics provided by prior D&O research using China data (see, e.g., Zou et al., 2008).

[9]As a robustness test, we repeated all analyses excluding firms in the financial and insurance sector. The results are qualitatively consistent with those reported in the main tests, although in some cases the results ae weaker due to smaller sample size.

[10]Our results are robust to using full, unmatched sample after controlling for self-selection bias by applying the Heckman two-stage approach (Heckman, 1979), as well as alternative matching schemes, including (1) one-to-one and one-to-two matching where each treatment firm is matched to one or two control firm(s) in the same industry, year, and with the closest size (total assets), and (2) one-to-one matching based on industry, year, and return on assets. Our main findings remain robust.

[11]The data of *Financial Institutions* is from the WANFANG database, http://www.wanfang.com.cn/

TABLE 1
Summary Statistics

Panel A: Sample Distribution by Year

Year	No. of Obs. ($D\&O = 1$)	Percentage (%)
2004	14	3.77
2005	18	4.85
2006	21	5.66
2007	34	9.16
2008	51	13.75
2009	56	15.09
2010	58	15.63
2011	58	15.63
2012	61	16.44
Total	371	100.00

Panel B: Sample Distribution by Industry

Industry Description	Industry Code	No. of Obs. ($D\&O = 1$)	Percentage (%)
Agriculture, forestry, and fisheries	A	0	0.00
Mining	B	16	4.31
Food and kindred products	C0	5	1.35
Textiles, apparel, and leather products	C1	9	2.43
Wood and furniture	C2	0	0.00
Paper and printing	C3	18	4.85
Petroleum, chemicals, rubber, and plastic products	C4	12	3.23
Electronic and electrical equipment and components	C5	13	3.50
Primary and fabricated metal products	C6	26	7.01

(*Continued*)

Table 1
Continued

Panel B: Sample Distribution by Industry

Industry Description	Industry Code	No. of Obs. ($D\&O = 1$)	Percentage (%)
Industrial machinery and equipment	C7	33	8.89
Medicinal chemicals and biological products	C8	31	8.36
Miscellaneous manufacturing	C9	0	0.00
Electric, gas, and sanitary services	D	5	1.35
Construction	E	3	0.81
Transportation and warehousing	F	45	12.13
Information, computer, and related services	G	8	2.16
Wholesale and retail trades	H	25	6.74
Financial and insurance	I	63	16.98
Real estate	J	24	6.47
Social services	K	23	6.20
Communication and culture	L	0	0.00
Conglomerates	M	12	3.23
Total		371	100

Panel C: Summary Statistics of Key Variables

	Sample With D&O Coverage ($D\&O = 1$)				PSM-Matched Sample ($D\&O = 0$)				
Variable	Obs.	Mean	Median	Std.	Obs.	Mean	Median	Std.	Mean Difference
Personal Attendance	371	0.93	0.95	0.07	371	0.95	0.97	0.07	−0.02***
Proxy Attendance	371	0.06	0.04	0.07	371	0.04	0.02	0.06	0.02***
Attendance Problem	371	0.22	0.00	0.42	371	0.15	0.00	0.36	0.07**

(*Continued*)

TABLE 1
Continued

Panel C: Summary Statistics of Key Variables

	Sample With D&O Coverage ($D\&O = 1$)				PSM-Matched Sample ($D\&O = 0$)				
Variable	Obs.	Mean	Median	Std.	Obs.	Mean	Median	Std.	Mean Difference
Min(Personal_Attendance)	371	0.83	0.86	0.15	371	0.87	0.90	0.14	−0.04***
Max(Proxy_Attendance)	371	0.15	0.13	0.14	371	0.11	0.08	0.13	0.04***
DiligenceScore_prop	303	0.02	0.02	0.01	303	0.02	0.02	0.01	−0.00***
DiligenceScore_tf.idf	303	1.34	1.13	0.84	303	1.62	1.50	1.09	−0.28***
Busy Board	371	0.36	0.00	0.48	371	0.25	0.00	0.44	0.11***
Violation	371	0.16	0.00	0.37	371	0.19	0.00	0.40	−0.03
Tobin's Q	371	1.79	1.37	1.08	371	1.74	1.37	1.03	0.05
Mgmt Comp	371	0.30	0.16	0.41	371	0.30	0.18	0.36	0.00
Boardsize	371	2.29	2.20	0.20	371	2.29	2.20	0.20	0.00
Duality	371	0.07	0.00	0.26	371	0.10	0.00	0.30	−0.03
Inst Investor	371	3.03	3.14	1.65	371	2.65	2.89	1.66	0.38***
Inst Ownership	371	6.03	2.26	8.10	371	5.46	1.74	8.24	0.57
Largest Shareholding	371	4.89	2.13	7.21	371	4.61	1.79	6.35	0.28
Leverage	371	0.60	0.60	0.20	371	0.58	0.59	0.20	0.02
Assets	371	9.05	9.44	1.31	371	8.92	9.02	1.22	0.13
ROA	371	0.03	0.03	0.04	371	0.04	0.03	0.05	−0.01
Related Party	371	0.02	0.00	0.05	371	0.02	0.00	0.06	0.00
SOE	371	0.44	0.00	0.50	371	0.40	0.00	0.49	0.04

Notes: This table reports sample distribution and descriptive statistics of key variables. Panel A reports the number of firms with D&O insurance coverage each year. Panel B reports the number of observations by industry. Panel C reports summary statistics of key variables, by firms with D&O coverage and propensity-score-matched firms. *T*-test is used to test for the mean difference. Definitions of variables are provided in the Appendix. ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively.

expect those firms to have a higher likelihood of coverage. A number of firms in our sample have foreign directors. To the extent that foreign directors may have a greater awareness of D&O insurance and/or are more concerned about litigation risk in a foreign country, they likely have greater demand for coverage. So we include a dummy variable *Foreigner* that equals 1 if the firm has at least one foreign director on its board. We also control for the effect of a firm's (perceived) litigation on D&O insurance decisions. We proxy for the potential litigation risk by financial leverage *Leverage* (Boyer and Tennyson, 2015), new share issue in the next year *Share Issue*, listing in overseas exchanges *Overseas*, firm size *Assets*, and firm profitability *ROA*. Zou et al. (2008) argue that shareholder incentive conflicts, especially expropriation by controlling shareholders through tunneling and related party transactions, represent a major cause for securities lawsuits in China. They find evidence that the amount of related party transactions significantly affect a firm's D&O insurance decisions, so we include *Related Party*, measured by the amount of related party transactions scaled by book value of total assets measured at the end of year. Zou et al. also argue that for firms where controlling shareholders have relatively more power, their tunneling activities are less likely to be challenged by other shareholders, leading to a lower demand for insurance coverage. So we include *Largest Shareholding*, measured by the shareholdings of largest shareholder divided by the sum of shareholdings by the second to fifth largest shareholders over the year. Busy directors likely have less time devoted to the firm and may demand D&O insurance to shield them away from personal liability and potential risk. So we include *Busy IndDir*, a dummy variable that equals 1 if a firm has at least one independent director holding three or more directorship in listed companies in the previous year. Zou et al. (2008), using a sample of Chinese firms, find that the proportion of independent directors on the board *%Independent Directors* has a positive impact on the likelihood of insurance purchase as risk-averse independent directors tend to demand coverage. So we include this variable. Finally, as the SPC Rules require a prior administrative sanction as the prerequisite for initiating a lawsuit against a firm, we include firm's prior penalty by the CSRC, *Penalty*, as a litigation risk proxy.

Internet Appendix 2 (Jia and Tang, 2016) reports the propensity score matching results. Number of financial institutions, overseas dual listing, the presence of foreign directors, and firm size all have a significant and positive impact on a firm's D&O insurance purchase decision. In contrast, controlling shareholder power, related party, profitability, and director's prior level of busyness have a significantly negative impact on the purchase decision. Then for each firm-year, we match it with a control firm with the closest propensity score. Table 1, Panel C provides summary statistics of variables used in the baseline analysis, by treatment and matched control firms. Definitions of variables are provided in the Appendix. To minimize the effect of outliers, we winsorize all continuous variables at the 5th and 95th percentiles. Univariate tests indicate significant differences in director behavior between firms with D&O insurance and matched control firms. In particular, compared to uninsured firms, insured firms exhibit lower personal meeting attendance by directors, higher proxy attendance, and more severe attendance problem. Directors at insured firms are also less diligent as manifested in the opinion reports they issue. Such directors are also significantly busier compared to uninsured directors. Among

control variables, for the ones used in the propensity score matching, the difference between insured firms and their uninsured peers are nearly all insignificant, which increases our confidence in the matching success.

EFFECT OF D&O INSURANCE COVERAGE ON INDEPENDENT DIRECTOR BEHAVIOR

Analysis of Board Meeting Attendance

Board meetings are the primary mechanism for outside directors to keep informed of a firm's operations, business conditions, and managerial decision making so that they can effectively participate in a firm's governance (Masulis, Wang, and Xie, 2012).[12] Meeting attendance decisions are based on the cost–benefit trade-offs, where costs include significant time commitment and financial expenses (e.g., travel costs). Benefits of attending board meetings include information acquisition and potentially lower litigation risk as a result of more extensive monitoring. To the extent that D&O insurance coverage hedges independent directors against personal liabilities in the face of litigation, it may reduce their incentives to attend board meetings. To examine how D&O insurance coverage affects meeting participation of independent directors, we estimate the following model:

$$Meeting\ Attendance = \alpha + \beta D\&O + \lambda' Firm\ Control + \delta' Board\ Control + \varepsilon, \qquad (1)$$

where the dependent variable is either (1) *Personal Attendance* or (2) *Proxy Attendance*. We explicitly distinguish between personal attendance and proxy attendance not only because of data availability, but more importantly because prior studies (e.g., Chou, Chung, and Yin, 2013) find that personal board meeting attendance enhances firm performance, while proxy attendance has an adverse performance implication. To further evaluate the net impact of D&O insurance on meeting participation and to make our variable measurement comparable to prior studies, we followed Adams and Ferriera (2008) to construct a third dependent variable (3) *Attendance Problem* that equals 1 if the firm has at least one independent director who personally attends fewer than 75 percent of the board meetings he/she is supposed to in a given year. In addition to examining average attendance rate across all directors, we also focus on the independent director in a firm with the most severe attendance problem, and use (4) *Min(Personal_Attendance)* and (5) *Max(Proxy_Attendance)* as alternative dependent variables.

The main variable of interest of this analysis is *D&O*, a dummy variable that equals 1 if a firm is covered by D&O insurance in a given year. *Firm Control* and *Board Control* are vectors of firm and board characteristics that could potentially affect board meeting

[12]Consistent with the importance of board meetings, Vafeas (1999) finds that stock price declines tend to prompt a higher frequency of board meetings that subsequently lead to an improvement in firm performance. Meeting attendance is also viewed as a measure of a director's expenditure of effort (Masulis and Mobbs, 2014). Institutional investors and governance activists have used board meeting attendance records to evaluate director performance, and directors who frequently miss board meetings are often criticized as being ineffective monitors and receive significantly fewer votes for their reelection (Cai et al., 2009).

attendance. Results are reported in Table 2. In column (1), where the dependent variable is *Personal Attendance* and industry and year fixed effects are included, coefficient estimate on *D&O* is −0.014 and significant at the 5 percent level, suggesting a negative association between a firm's D&O insurance coverage and personal board meeting attendance by its independent directors. In column (2), we added firm fixed effect to the regression to absorb time-invariant firm unobservable characteristics. The coefficient estimate on *D&O* remains significantly negative. In columns (3) and (4) where we examine *Proxy Attendance* as the dependent variable, the coefficient on D&O is significantly positive controlling for industry, year, and firm fixed effect. These findings suggest that insured independent directors are more inclined to delegate their board duties to authorized representatives.[13] To evaluate the net impact of D&O insurance on meeting attendance, we use *Attendance Problem* as the dependent variable in columns (5) and (6) and conduct a logit regression given the variable's binary nature. The coefficient estimate on *D&O* is significantly positive, suggesting firms with D&O insurance indeed experience more severe board meeting attendance problem compared to their uninsured peers.[14] In columns (7)–(10), we replace average personal attendance rate by attendance records of independent directors in each firm with the most severe attendance problem. The coefficient estimate on D&O is significantly negative in columns (7) and (8) where the dependent variable is *Min(Personal_Attendance)* and significantly positive in columns (9) and (10) where the dependent variable is *Max(Proxy_Attendance)*.

Taken together, our examination of meeting attendance yields results indicative of moral hazard and a lower level of director effort associated with D&O insurance coverage. Specifically, we find that D&O insurance is associated with lower personal meeting attendance by independent directors and a greater use of authorized

[13]As shown in Table 1, Panel C, the two attendance variables *Personal Attendance* and *Proxy Attendance* exhibit relatively small variation. To ensure the robustness of our findings, we also examined two alternative sets of attendance measures. The first set of measures, *Personal Attendance_odds* and *Proxy Attendance_odds*, are calculated as *Ln(Personal Attendance/(1 − Personal Attendance))* and *Ln(Proxy Attendance/(1 − Proxy Attendance))*, respectively. A challenge with this measure is that the maximum *Personal Attendance* of our sample firms is 1 and the minimum *Proxy Attendance* is 0, which cannot be transformed into log-odds. Our solution is to winsorize these observations to the next highest (lowest) value among sample firms. Specifically, if *Personal Attendance* = 1, we set *Personal Attendance* = 0.997. If *Proxy Attendance* = 1, we set *Proxy Attendance* = 0.003. The second set of measures, *Personal Attendance_dummy* and *Proxy Attendance_dummy*, are dummy variables that equal 1 if *Personal Attendance_dummy* (*Proxy Attendance_dummy*) is above the sample mean, and 0 otherwise. Our findings remain robust to these alternative measures. We thank the referee for this suggestion.

[14]Among control variables, we find that board size negatively relates to personal attendance and positively relates to proxy attendance and attendance problem. One possible explanation is that larger board makes it easier to free-ride on other directors' monitoring efforts. We also find that number of institutional investors negatively relates to personal attendance and positively relates to proxy attendance. Consistent with Adams and Ferreira (2008) and Masulis and Mobbs (2014), we find that directors are significantly less likely to miss board meetings and are more likely to personally attend the board meetings of larger firms.

TABLE 2
D&O Insurance Coverage and Board Meeting Attendance

	Personal Attendance		*Proxy Attendance*		*Attendance Problem*		*Min(Personal Attendance)*		*Max(Proxy Attendance)*	
Dependent Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
D&O	−0.014**	−0.034***	0.016***	0.048***	0.556**	0.803*	−0.038***	−0.116***	0.037***	0.098***
	(−2.312)	(−3.645)	(2.845)	(5.637)	(2.340)	(1.923)	(−3.071)	(−6.016)	(3.284)	(5.963)
Boardsize	−0.039**	0.004	0.044***	0.012	1.599**	1.457	−0.121***	−0.017	0.125***	0.046
	(−2.328)	(0.099)	(2.932)	(0.321)	(2.101)	(1.402)	(−3.348)	(−0.188)	(4.099)	(0.517)
Duality	−0.007	−0.010	0.007	0.005	−0.232	−0.383	−0.006	−0.027	−0.003	−0.001
	(−0.615)	(−0.458)	(0.619)	(0.234)	(−0.498)	(−0.650)	(−0.290)	(−0.775)	(−0.200)	(−0.028)
Mgmt Comp	−0.002	0.017	0.001	−0.015	−0.284	−0.308	0.006	0.009	0.001	0.003
	(−0.137)	(0.593)	(0.046)	(−0.500)	(−0.576)	(−0.471)	(0.227)	(0.190)	(0.025)	(0.059)
Inst Investor	−0.009**	0.001	0.009**	0.006	0.125	0.003	−0.010	0.014	0.015*	0.008
	(−2.117)	(0.120)	(2.458)	(1.009)	(0.657)	(0.010)	(−1.020)	(0.792)	(1.786)	(0.626)
Inst Ownership	0.000	0.001	−0.001	−0.001	−0.009	−0.018	0.000	0.002	−0.001	−0.003*
	(0.750)	(0.601)	(−1.160)	(−1.384)	(−0.378)	(−0.394)	(0.352)	(0.702)	(−0.904)	(−1.721)
Largest Shareholding	−0.000	−0.001	0.000	−0.000	0.002	0.013	−0.000	0.002	0.001	−0.002
	(−0.369)	(−0.348)	(0.532)	(−0.111)	(0.097)	(0.545)	(−0.161)	(0.747)	(0.730)	(−0.874)
Leverage	−0.009	0.010	0.013	−0.017	0.458	1.588	0.001	0.032	0.041	−0.007
	(−0.411)	(0.241)	(0.659)	(−0.414)	(0.454)	(1.211)	(0.028)	(0.324)	(1.002)	(−0.084)
ROA	0.040	−0.027	0.043	0.006	0.884	1.976	−0.020	−0.134	0.188	0.124
	(0.447)	(−0.222)	(0.592)	(0.049)	(0.219)	(0.448)	(−0.109)	(−0.441)	(1.167)	(0.439)
Assets	0.015***	0.035	−0.016***	−0.024	−0.394	−0.376	0.021*	0.023	−0.027**	−0.011
	(2.700)	(1.448)	(−3.183)	(−0.974)	(−1.519)	(−1.045)	(1.789)	(0.568)	(−2.583)	(−0.263)
Related Party	−0.015	0.061	0.025	−0.161	3.520	4.797**	−0.080	−0.066	0.116	−0.127
	(−0.255)	(0.341)	(0.473)	(−0.917)	(1.643)	(2.054)	(−0.681)	(−0.300)	(1.080)	(−0.508)
SOE	−0.002	−0.014	0.004	0.014	0.136	0.009	−0.005	−0.026	0.007	0.029
	(−0.389)	(−0.818)	(0.619)	(0.887)	(0.507)	(0.023)	(−0.396)	(−0.704)	(0.575)	(0.841)

(*Continued*)

Table 2
Continued

	Personal Attendance		*Proxy Attendance*		*Attendance Problem*		*Min(Personal Attendance)*		*Max(Proxy Attendance)*	
Dependent Variable	(1)	(2)	(3)	(4)	(5)	(6)	*(7)*	(8)	(9)	(10)
Constant	0.832***	0.598**	0.122**	0.235	−1.385	−0.191	0.827***	0.604	0.099	0.104
	(13.324)	(2.562)	(2.013)	(0.965)	(−0.629)	(−0.053)	(6.259)	(1.378)	(0.784)	(0.257)
Industry fixed effect	Included	–	Included	–	Included	–	Included	–	Included	–
Year fixed effect	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Firm fixed effect	–	Included	–	Included	–	Included	–	Included	–	Included
Observations	742	742	742	742	742	742	742	742	742	742
Adjusted R^2/Pseudo R^2	0.15	0.34	0.13	0.34	0.15	0.26	0.13	0.28	0.13	0.30

Notes: This table reports regression results of D&O insurance coverage on board meeting attendance based on firms with D&O coverage and propensity-score-matched firms. Definitions of variables are provided in the Appendix. *T*- or *z*-statistics based on heteroskedasticity-robust standard errors and clustering at the firm level are displayed in parentheses. ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively.

representatives to attend board meetings on their behalf. Overall, firms with D&O insurance experience more severe attendance problems compared to firms without the insurance.

Analysis of Independent Director Opinion Reports

In this section, we examine a second measure of independent director diligence level as manifested in their opinion reports. In China, independent directors of listed companies are required to publicly disclose an opinion report on material corporate matters following every board meeting. Opinion reports generally contain a description of the subject matter and independent director opinions (consent or dissent); however, they differ in additional information disclosed, including for example, whether independent directors conducted due diligence before forming their opinions, and any additional comments they made about the subject matter. Opinion reports also vary significantly in lexical features and chosen tone when independent directors express their stance on the subject. Information disclosed in the opinion reports are perceived to be objective and credible as these reports are subject to review by the CSRC and relevant regulatory bodies and independent directors are held accountable for the content.

We use content analysis method to systematically examine the quality and lexical features of independent director opinion reports to further understand how diligent they are in carrying out their fiduciary duties.[15] Broadly, content analysis uses algorithms that have two important components. The first component is a word list or the algorithms lexicon, and the second component is how each word in a lexicon is weighted, which along with its lexicon enables the algorithm to map descriptive content of any document into a quantitative score.[16] To the best of our knowledge, there is no readily available dictionary that quantifies an agent's diligence level. Therefore, as the first step, we construct a *Diligence Dictionary* that captures how responsible independent directors are in serving their fiduciary duties. Specifically, two researchers each randomly picked and carefully read through 20 percent of independent director opinion reports in the sample to familiarize herself/himself with the content. Each researcher then independently proposed a word list that reflects director's effort level along the following four dimensions.

The first dimension captures independent directors' investigations of the subject matter before forming their opinions. Researchers identified words such as *investigate*, *check*, and *verify* that pertain to independent directors' self-conducted due

[15]A growing body of research in accounting and finance has used content analysis to convert qualitative information into quantitative measures. Schwartz-Ziv and Weisbach (2013) perform a content analysis on board meeting minutes of 11 Israeli companies to examine the role of corporate boards. Antweiler and Frank (2004), Loughran and McDonald (2011), Jegadeesh and Wu (2013), among others, perform content analysis to examine the tone and sentiment of corporate 10-K reports, newspaper articles, and press releases.

[16]Prior studies on the tone of corporate documents typically use existing dictionary such as the *Harvard Psychosociological Dictionary* that classifies a word into certain category (e.g., positive, negative, strong, weak).

diligence that is indicative of their effort level.[17] The second dimension of independent directors' diligence level pertains to whether they pointed out any managerial indiscretion or governance weakness in their opinion reports. Researchers looked for words such as *incomplete*, *mistake*, and *flawed* in sentences where independent directors discuss the subject matter. Panel C of Internet Appendix 3 (Jia and Tang, 2016) provides one such example. Pointing out managerial indiscretions or governance weakness is indicative of director monitoring efforts and outcome. In addition, they are indicative of independent directors' willingness to "blow the whistle" and confront management. However, researchers also argue that independent directors may be reluctant to confront management because doing so may reduce their chance of reappointment and, in some extreme cases, leads to the loss of current board seats (Lin et al., 2012; Ma and Khanna, 2013). Therefore, words that indicate managerial indiscretions or governance weakness in publicly disclosed opinion reports suggest independent directors are willing to serve as a check on management.

The third dimension of independent directors' diligence level pertains to how strongly and seriously they urge managers to take further actions as stated in their opinion reports. In particular, researchers identified words such as *urge*, *proactively*, and *completely* in sentences where independent directors discuss future managerial actions. Those words capture the tone of independent directors that reflects how strongly and seriously they are in persuading and disciplining the management. Panel D of Internet Appendix 3 (Jia and Tang, 2016) provides one such example. The fourth dimension captures independent directors' willingness to issue an opposing opinion. Researchers looked for words such as *disagree* and *oppose* in sentences where independent directors express their opinions, indicating that they do not fully agree with the management. Panel E of Internet Appendix 3 provides one such example. After obtaining two independently constructed diligence dictionaries, two researchers compared their dictionaries, which resulted in a match rate of 86 percent. The two researchers then discussed the unmatched words and reached an agreement on the classification.[18] The final *Diligence Dictionary* is provided in Internet Appendix 4.

The second major component of content analysis is to determine how each word in a lexicon should be weighted to obtain a quantitative score. Following Loughran and McDonald (2011), we use two alternative weighting schemes. The first score *DiligenceScore_prop* is constructed based on proportional weights, measured as the ratio of the word counts in the *Diligence Dictionary* to the total number of words in an opinion report in year t, and averaged across all opinion reports in a given year. The higher the score, the more diligently independent directors work.

A potential drawback of proportional weighting scheme is that high-frequency words may be overweighted. To mitigate this concern, we introduce a second

[17]For the purpose of illustration, Panels A and B of Internet Appendix 3 contrast two opinion reports on the renewal of auditing firm. Report in Panel A simply expresses a consent opinion, whereas report in Panel B clearly states that independent directors conducted due diligence before reaching their conclusions.

[18]Results are qualitatively the same if we drop those unmatched words from the dictionary.

weighting scheme *tf.idf Score*:[19]

$$tf.idf\ Score_{i,j} = \begin{cases} \dfrac{1+\log\left(tf_{i,j}\right)}{1+\log(a_i)}\log\left(\dfrac{N}{df_j}\right), & \text{if } tf_{i,j} \geq 1 \\ 0, & \text{otherwise,} \end{cases} \quad \text{(i)}$$

where N represents the total number of independent director opinion reports in our sample, df_j denotes the number of documents that contain at least one occurrence of the jth word, $tf_{i,j}$ is the raw count of the jth word in the ith report, and a_i is the total number of words in the ith report. The first term attenuates the impact of high-frequency words with a log transformation. The second term modifies the impact of a word based on its commonality. After obtaining *tf.idf Score* for every word listed in the *Diligence Dictionary* for the ith report, we sum them up to get *tf.idf Score*$_i$. As independent directors at a firm usually issue more than one opinion report in a year, we average *tf.idf Score*$_i$ across all opinion reports in a year to obtain a score, *DiligenceScore_tf.idf*. The higher the score, the more diligently independent directors work. To examine the impact of D&O insurance coverage on director effort level as manifested in the opinion reports, we estimate the following model:

$$DiligenceScore\_prop(DiligenceScore\_tf.idf) = \alpha + \beta D\&O + \lambda' Firm\ Control + \delta' Board\ Control + \varepsilon. \quad (2)$$

Table 3 presents the regression results of Equation (2).[20] The dependent variable in the first two columns is *DiligenceScore_prop*, where column (1) includes industry and year fixed effects and column (2) includes year and firm fixed effect. In both columns, the coefficient on *D&O* is significantly negative. In columns (3) and (4) with *DiligenceScore_tf.idf* as dependent variable, the coefficient on *D&O* is also significantly negative. Together, these results suggest that D&O insurance coverage has an adverse impact on independent director's diligence level in monitoring and disciplining the management as disclosed in their opinion reports.

Analysis of Independent Director Busyness

In this section, we examine a third measure of independent director effort level—busyness as measured by the number of directorships held. Board busyness is an issue of debate and has been receiving increasing research attention in recent years. Some argue that appointment of directors with multiple board seats are value enhancing because they are a certification of a director's abilities or scope of network

[19] *tf* (term frequency) represents the method used to account for the word frequency and normalization, and *idf* (inverse document frequency) denotes the method used to adjust for impact across the entire collection (Loughran and McDonald, 2011).

[20] As a robustness test, instead of averaging the score across all independent director opinion reports, we use the highest or lowest score of *DiligenceScore_prop* and *DiligenceScore_tf.idf* in a given year and repeat the analyses. All results are qualitatively the same.

Table 3
D&O Insurance Coverage and Independent Director Diligence

	DiligenceScore_prop	*DiligenceScore_prop*	*DiligenceScore_tf.idf*	*DiligenceScore_tf.idf*
Dependent Variable	(1)	(2)	(3)	(4)
D&O	−0.003***	−0.007***	−0.285***	−0.550**
	(−3.330)	(−3.132)	(−3.004)	(−2.503)
Boardsize	−0.005*	0.001	−0.217	0.271
	(−1.712)	(0.164)	(−0.658)	(0.388)
Duality	−0.001	−0.001	−0.294*	−0.217
	(−0.601)	(−0.462)	(−1.657)	(−0.713)
Mgmt Com	0.003**	0.004	0.396**	0.555
	(2.014)	(0.932)	(2.469)	(1.329)
Inst Investor	−0.000	−0.000	−0.029	−0.058
	(−0.148)	(−0.256)	(−0.447)	(−0.407)
Inst Ownership	0.000	−0.000	0.007	0.010
	(0.397)	(−0.350)	(0.667)	(0.509)
Largest Shareholding	−0.000	−0.000	−0.002	0.020
	(−0.331)	(−0.711)	(−0.265)	(1.250)
Leverage	0.001	−0.001	0.620*	−0.061
	(0.296)	(−0.132)	(1.710)	(−0.070)
ROA	−0.021*	−0.013	−0.390	−0.424
	(−1.651)	(−0.418)	(−0.325)	(−0.210)
Assets	0.000	0.001	−0.027	0.124
	(0.077)	(0.300)	(−0.319)	(0.436)
Related Party	−0.018*	−0.001	−1.789	−1.773
	(−1.662)	(−0.018)	(−1.548)	(−0.684)
SOE	0.000	−0.001	0.029	−0.216
	(0.273)	(−0.530)	(0.288)	(−0.742)

(*Continued*)

TABLE 3
Continued

	DiligenceScore_prop	*DiligenceScore_prop*	*DiligenceScore_tf.idf*	*DiligenceScore_tf.idf*
Dependent Variable	(1)	(2)	(3)	(4)
Constant	0.028***	0.018	1.599*	0.006
	(3.482)	(0.670)	(1.683)	(0.002)
Industry fixed effect	Included	–	Included	–
Year fixed effect	Included	Included	Included	Included
Firm fixed effect	–	Included	–	Included
Observations	606	606	606	606
Adjusted R^2	0.07	0.25	0.10	0.43

Notes: This table reports regression results of D&O insurance coverage on independent directors' level of diligence based on firms with D&O coverage and propensity-score-matched firms. Definitions of variables are provided in the Appendix. *T*-statistics based on heteroskedasticity-robust standard errors and clustering at the firm level are displayed in parentheses. ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively.

(Fama and Jensen, 1983).[21] In contrast, some researchers argue that directors over-commit themselves as they take on multiple board seats that reduce their efficacy as advisors and monitors.[22]

We conjecture that if D&O insurance coverage allows independent directors to reduce effort level at the incumbent firm, it will likely give them more time and energy to take on directorships at other firms. In contrast, if D&O insurance encourages independent directors to carry out their oversight role more diligently, it may constrain independent director's capacity to serve on other boards. To examine how D&O insurance coverage affects the busyness of independent directors, we estimate:

$$Prob(Busy\ Board) = \alpha + \beta D\&O + \lambda' Firm\ Control + \delta' Board\ Control + \varepsilon, \qquad (3)$$

where the dependent variable *Busy Board* is a dummy variable that takes the value of 1 if more than half of the firm's independent directors are busy. Following Fich and Shivdasani (2006), we consider a director to be busy if he or she serves on three or more boards.[23] To allow for possible time lag between the purchase of D&O insurance and

[21]In line with this argument, Brickley et al. (1999) find that the likelihood that a retired CEO sits on his own board or other boards is positively associated with the performance of his firm. Ferris et al. (2003) find that the better the performance of firms at which the director serves, the more likely the director is to hold more board seats going forward. Conversely, Gilson (1990) finds that directors at financially distressed firms hold fewer board seats in the future. Similarly, Shivdasani (1993) reports that outside directors at firms that are the target of a hostile takeover attempt hold fewer board seats going forward. The findings that directors associated with better performing firms hold more directorships, while those associated with poor performing firms hold fewer, are consistent with multiple board seats certifying director quality.

[22]Consistent with this argument, Fich and Shivdasani (2006) find that busy directors are associated with lower market-to-book ratios, and CEO turnover is less sensitive to performance in such firms. In addition, busy directors are associated with excessive CEO pay and greater attendance problems at board meetings (e.g., Core et al., 1999). Shivdasani and Yermack (1999) examine CEO involvement with the nomination of new directors and find that CEOs tend to select directors who are predisposed to monitor management less and have multiple board seats. Ahn et al. (2010) find that acquiring firms where directors hold more seats experience more negative acquisition announcement returns while Jiraporn et al. (2008) report larger diversification discounts when directors hold multiple board seats. This perspective is echoed by institutional investors proposing "best practices" that would limit the number of board seats a director can hold.

[23]Our main measure of director busyness, although commonly used in prior literature, is defined in a highly restrictive manner. To ensure the robustness of our results, we used two alternative definitions of this variable. The first variable *Busy Top* is a dummy variable that equals 1 if the board's percentage of busy independent directors is in the top quartile across sample firms (Falato et al., 2014). The second variable *Busy Factor* is a dummy variable that equals 1 if the director's busyness factor is in the top quartile of the sample distribution. The busyness factor is a composite measure of busyness, that is, a linear combination of percentage of busy independent directors, director's outside directorships, number of board meetings, and with weights obtained from factor analysis. The factor loadings are as following: 0.91 for percentage of busy independent directors, 0.91 for director's outside directorships, and 0.03 for number of meetings. We reconducted Equation (3) and the results (untabulated) are qualitatively the same.

attainment of new directorships at other firms, we examine number of directorships one year ahead (i.e., year $t + 1$). Firm and board characteristics are the same as in Equation (1).

Table 4 presents the logit regression results estimating Equation (3). Column (1) includes industry and year fixed effect, and column (2) includes year and firm fixed effect. The coefficient estimates of *D&O* are significantly positive in both columns, suggesting that firms under coverage are more likely to have a busy board. When combining this finding with results obtained from meeting attendance and opinion reports, it appears that D&O insurance coverage reduces independent directors'

TABLE 4
D&O Insurance Coverage and Independent Director Busyness

	Busy Board	
Dependent Variable	(1)	(2)
D&O	0.506*	0.702*
	(1.860)	(1.648)
Boardsize	−0.234	−0.751
	(−0.295)	(−0.734)
Duality	−0.037	−0.109
	(−0.084)	(−0.218)
Mgmt Comp	0.255	0.003
	(0.589)	(0.004)
Inst Investor	0.302	0.265
	(1.626)	(1.158)
Inst Ownership	−0.067**	−0.075**
	(−2.244)	(−2.015)
Largest Shareholding	−0.021	−0.022
	(−1.032)	(−0.796)
Leverage	0.254	0.770
	(0.290)	(0.648)
ROA	0.819	1.904
	(0.230)	(0.460)
Assets	0.225	0.271
	(0.933)	(0.812)
Related Party	2.533	2.920
	(1.030)	(0.929)
SOE	−0.047	−0.271
	(−0.160)	(−0.732)
Constant	−18.474***	−18.107***
	(−7.250)	(−5.252)
Industry fixed effect	Included	–
Year fixed effect	Included	Included
Firm fixed effect	–	Included
Observations	742	742
Pseudo R^2	0.15	0.20

Notes: This table reports regression results of D&O insurance coverage on independent director busyness based on firms with D&O coverage and propensity-score-matched firms. Definitions of variables are provided in the Appendix. *Z*-statistics based on heteroskedasticity-robust standard errors and clustering at the firm level are displayed in parentheses. ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively.

commitment and efforts to the firm and encourages them to pursue additional directorships at other firms.

Analysis of Behavior Controlling for Director-Level Characteristics

As D&O insurance provides equal coverage for all board members and the purchase decision is made at the firm level, in previous sections we conducted analyses at the firm level without explicitly controlling for interdirector differences. However, there is a concern that the observed differences in director behavior between firms with and without insurance coverage may be driven by systematic differences in the board composition and director characteristics. A growing stream of literature in accounting and finance has demonstrated the importance of individual effects in explaining corporate decisions and performance outcomes.[24] For robustness and to address the concern that systematic differences in board composition or director characteristics may be driving our results, we collect data on individual director characteristics and repeat all analyses at the directorship level. Specifically, we include director's financial expertise, tenure at the firm, compensation, reputation incentives, location, gender, age, and multiple directorships.[25]

[24]In a seminal study, Bertrand and Schoar (2003) show that a significant portion of heterogeneity in corporate investment, financial, and organizational practices can be explained by the presence of executive fixed effects. Bamber et al. (2010) examine executive fixed effects on corporate financial disclosure policies and find that individual managers have a significant effect on voluntary disclosure. Ge et al. (2011) find that CFO-specific characteristics explain a significant portion of the heterogeneity in financial reporting practices.

[25]DeFond et al. (2005) suggest that directors with greater professional ability are more likely to blow the whistle within the board, so we include a financial expertise variable, *Financial Expertise_Dir*, which equals 1 if the director has financial expertise, that is, experience as a public accountant, auditor, principal, or chief financial officer, controller, or principal or chief accounting officer, and 0 otherwise. Masulis and Mobbs (2014) find that longer director tenure is associated with lower likelihood of missing board meetings; we therefore include a director tenure variable *Tenure_Dir*, measured as the natural logarithm of (1 + number of years the director has served on the board). Adams and Ferreira (2008) find that director effort level is driven by financial incentives and document a positive relation between director compensation and board meeting attendance. We therefore include a director compensation variable, *Compensation_Dir*, which is measured as the natural logarithm of (1 + annual director pay, in RMB ten thousands). Masulis and Mobbs (2014) argue that independent directors distribute their efforts nonuniformly across their directorships and that their effort level is driven by reputation incentives. They find that as a directorship increases in relative importance, a measure of reputation incentives, independent directors' meeting attendance rates increase. We therefore include *Reputation Incentive_Dir*, measured as the difference in the natural logarithm of total assets between incumbent firm and the director's smallest directorship by the end of a year. Masulis et al. (2012) argue that director's geographic remoteness to the firm increases logistical difficulties in traveling and document a negative effect of physical distance to the firm on board meeting attendance. We therefore include *Location_Dir*, an indicator variable that equals 1 if the independent director resides in the same province as the firm. Following Adams and Ferreira (2009), Srinidhi et al. (2011), and Larcker et al. (2007), we also include *Gender_Dir*, which equals 1 for female director and whether the director is older than 60 (*Age_Dir* > 60). Finally, we include *Serve_Multi_Dir* for director who serves on more than one board.

Table 5 reports regression results using director-level observations, with meeting attendance in Panel A, and diligence and busyness in Panel B. The main variable of interest is still D&O insurance coverage. We included the same set of firm and board characteristics as in the firm-level analyses but suppressed their coefficients for brevity. We also included director fixed effect in addition to industry, year, and firm fixed effects to observe any time-invariant director characteristics. We obtained similar results as we did with firm-level data, which suggests that the effect of D&O insurance coverage we document is not entirely driven by director fixed effects.[26]

ADDITIONAL ANALYSES

First-Time Purchase of D&O Insurance

As another way to address omitted variable problem and in an attempt to establish causality, we focus on the first-time purchase of D&O insurance and examine how initiation of D&O insurance coverage *alters* independent director incentive and effort level. We used the same propensity score matching algorithm as in the main analyses. The one-to-one matching results in 41 treatment and 41 control firms as firms are required to have available data on independent director behavior 1 year before and after the D&O insurance purchase.

Before reporting the regression results, we first provide some graphical evidence in Figures 2–4 depicting the difference in the frequency of board meeting attendance, diligence level, and busyness between treatment and control firms (i.e., treatment-control) 1 year before and after first-time purchase of D&O insurance coverage. The magnitude of difference in personal meeting attendance becomes larger in the year following D&O insurance purchase, and the sign of difference also changes from positive in the prepurchase year to negative in the postpurchase year. This finding implies that once independent directors become insured, the number of board meetings they personally attend declines. We observe similar trends with diligence scores.[27] We observe an opposite trend in proxy attendance, suggesting that once independent directors become insured, they are more inclined to delegate their board duties to authorized representatives. Similar trend is observed for director busyness.

Table 6 reports the results of regression analyses. Dependent variables are changes in independent director behavior between year −1 and year 1 (i.e., year 0 is the year of first-time D&O insurance purchase). Change specification helps eliminate confounding factors that are time invariant. We also control for factors that may potentially

[26]We conducted two robustness tests. First, we excluded directors who serve on only one company board. Second, we used a sample of directors who serve on multiple boards with varying D&O coverage status. Our findings remain robust to these alternative samples.

[27]To get a more intuitive sense of the change as reflected in the opinion reports, in Internet Appendix 5 we provide two opinion reports issued by the same company and independent directors on a hiring decision before and after the insurance coverage. The report in the precoverage period clearly states the kinds of due diligence that independent directors conducted on the candidate before making their decisions whereas the report issued in the postcoverage period did not contain such information.

Table 5
D&O Insurance and Independent Director Behavior— Director-Level Analysis

Panel A: Attendance

	Personal Attendance_Dir			*Proxy Attendance_Dir*			*Attendance Problem_Dir*		
Dependent Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
D&O	−0.016***	−0.071***	−0.093***	0.017***	0.084***	0.114***	0.419**	1.308***	1.096**
	(−2.881)	(−7.314)	(−3.373)	(3.128)	(8.052)	(4.359)	(2.297)	(3.209)	(2.519)
Financial Expertise_Dir	0.017***	0.016***	0.007	−0.015***	−0.015***	−0.011	−0.376**	−0.438**	−0.543**
	(3.612)	(2.909)	(0.241)	(−3.817)	(−3.398)	(−0.428)	(−2.250)	(−2.139)	(−2.574)
Location_Dir	0.008	0.015*	0.019	−0.010**	−0.012*	−0.021	−0.158	−0.235	−0.272
	(1.432)	(1.666)	(0.882)	(−1.979)	(−1.676)	(−0.975)	(−0.726)	(−0.727)	(−0.807)
Gender_Dir	−0.004	−0.002	–	0.001	0.001	–	−0.129	−0.063	–
	(−0.489)	(−0.249)	–	(0.190)	(0.151)	–	(−0.475)	(−0.186)	–
Age_Dir	0.012**	0.008	0.028	−0.009*	−0.006	−0.017	−0.408	−0.313	−0.438
	(2.250)	(1.260)	(0.689)	(−1.669)	(−0.980)	(−0.536)	(−1.526)	(−1.014)	(−1.322)
Compensation_Dir	0.003	0.004	−0.004	0.001	−0.000	0.004	−0.249**	−0.384***	−0.359***
	(0.576)	(0.698)	(−0.300)	(0.181)	(−0.089)	(0.285)	(−1.977)	(−3.008)	(−2.600)
Tenure_Dir	−0.002	0.001	0.020	0.002	0.001	−0.016	−0.139	−0.039	−0.077
	(−0.409)	(0.071)	(1.575)	(0.523)	(0.146)	(−1.326)	(−0.769)	(−0.170)	(−0.331)
Reputation Incentive_Dir	0.000	0.001	0.001	−0.000	−0.001	0.000	−0.001	−0.033	−0.007
	(0.121)	(0.669)	(0.188)	(−0.081)	(−0.523)	(0.037)	(−0.017)	(−0.354)	(−0.072)
Serve_Multi_Dir	−0.003	0.001	0.008	0.005	0.003	0.000	−0.065	−0.138	0.018
	(−0.243)	(0.032)	(0.259)	(0.349)	(0.200)	(0.009)	(−0.118)	(−0.200)	(0.026)
Constant	0.883***	0.681***	0.777**	0.092	0.184	0.242	−14.433***	−14.559***	−15.368***
	(14.590)	(3.291)	(2.350)	(1.542)	(0.801)	(0.734)	(−7.201)	(−5.333)	(−4.121)
Firm and board characteristics	Included	Included	Included	Included	Included	Included	Included	Included	Included
Industry fixed effect	Included	–	–	Included	–	–	Included	–	–
Year fixed effect	Included	Included	Included	Included	Included	Included	Included	Included	Included

(*Continued*)

Table 5
Continued

Panel A: Attendance

	Personal Attendance_Dir			*Proxy Attendance_Dir*			*Attendance Problem_Dir*		
Dependent Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Firm fixed effect	–	Included	Included	–	Included	Included	–	Included	Included
Director fixed effect	–	–	Included	–	–	Included	–	–	Included
Observations	2,360	2,360	2,360	2,360	2,360	2,360	2,360	2,360	2,360
Adjusted R^2/Pseudo R^2	0.08	0.13	0.20	0.07	0.13	0.16	0.12	0.28	0.29

Panel B: Diligence and Busyness

	DiligenceScore_tf.idf _Dir			*DiligenceScore_ prop_Dir*			*Busy_Dir*		
Dependent Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
D&O	−0.257**	−1.110***	−1.752***	−0.003***	−0.014***	−0.018***	0.506**	1.296**	1.267**
	(−2.557)	(−5.816)	(−4.052)	(−3.534)	(−5.934)	(−4.011)	(1.967)	(2.443)	(2.300)
Financial Expertise_Dir	−0.044	0.013	0.041	0.000	0.000	0.000	0.668**	1.012***	1.047***
	(−0.892)	(0.574)	(0.170)	(0.339)	(0.920)	(0.151)	(2.573)	(3.097)	(3.036)
Location_Dir	−0.069	−0.012	0.182	−0.000	0.000	0.001	0.917***	1.380***	1.334***
	(−0.964)	(−0.339)	(0.669)	(−0.046)	(0.551)	(0.442)	(3.488)	(4.490)	(4.225)
Gender_Dir	−0.034	−0.076	–	0.000	−0.000	–	0.065	−0.122	–
	(−0.513)	(−1.526)	–	(0.045)	(−0.958)	–	(0.178)	(−0.247)	–
Age_Dir	−0.107*	−0.037	0.118	−0.000	−0.000	0.001	−1.347***	−1.328**	−1.254**
	(−1.878)	(−1.288)	(0.497)	(−0.130)	(−0.435)	(0.433)	(−2.728)	(−2.217)	(−2.116)

(*Continued*)

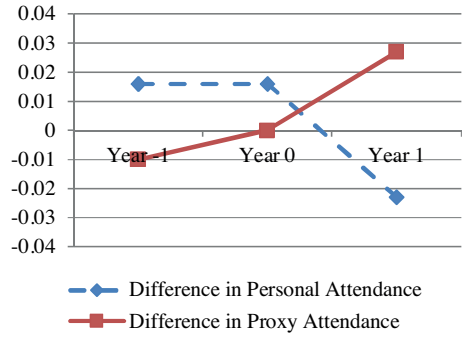
Table 5
Continued

Panel B: Diligence and Busyness

	DiligenceScore_tf.idf _Dir			*DiligenceScore_ prop_Dir*			*Busy_Dir*		
Dependent Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Compensation_Dir	0.013	0.076*	0.138	−0.001	−0.000	−0.000	0.062	0.090	0.048
	(0.232)	(1.663)	(1.131)	(−1.122)	(−0.465)	(−0.259)	(0.316)	(0.297)	(0.160)
Tenure_Dir	0.183**	0.157*	0.135	0.002***	0.001	0.002	−0.147	−0.059	0.003
	(2.234)	(1.752)	(0.754)	(2.632)	(1.469)	(1.116)	(−0.541)	(−0.172)	(0.009)
Reputation Incentive_Dir	0.000	−0.015	0.002	−0.000	−0.000	0.000	−0.137**	−0.161*	−0.160
	(0.000)	(−1.637)	(0.080)	(−0.565)	(−0.893)	(1.558)	(−1.977)	(−1.653)	(−1.606)
Serve_Multi_Dir	0.047	−0.157**	−0.133	−0.000	−0.001	0.001	2.354***	2.211**	2.211**
	(0.383)	(−2.169)	(−0.564)	(−0.285)	(−1.066)	(0.390)	(3.146)	(2.256)	(2.211)
Constant	1.625	−0.006	−0.840	0.026***	0.008	−0.011	−40.454***	−41.889***	−41.687***
	(1.632)	(−0.003)	(−0.205)	(3.448)	(0.298)	(−0.220)	(−14.723)	(−12.471)	(−12.180)
Firm and board characteristics	Included	Included	Included	Included	Included	Included	Included	Included	Included
Industry fixed effect	Included	–	–	Included	–	–	Included	–	–
Year fixed effect	Included	Included	Included	Included	Included	Included	Included	Included	Included
Firm fixed effect	–	Included	Included	–	Included	Included	–	Included	Included
Director fixed effect	–	–	Included	–	–	Included	–	–	Included
Observations	1,859	1,859	1,859	1,859	1,859	1,859	2,360	2,360	2,360
Adjusted R^2/Pseudo R^2	0.13	0.64	0.50	0.13	0.56	0.39	0.33	0.44	0.45

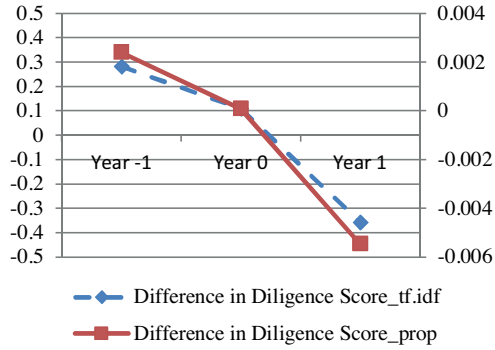
Notes: This table reports regression results of the effect of D&O insurance coverage on independent directors' behavior at directorship level. Definitions of variables are provided in the Appendix. Firm and board characteristics are included but their coefficients are suppressed for brevity. *T*- or *z*-statistics based on heteroskedasticity-robust standard errors and clustering at the firm level are displayed in parentheses. ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively.

FIGURE 2
Difference in Meeting Attendance



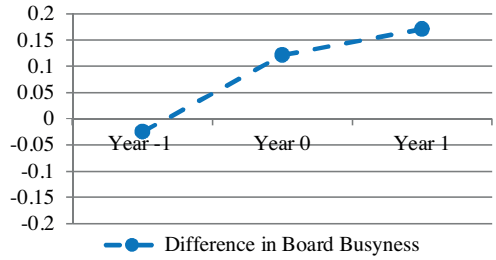
Note: This figure depicts difference in personal meeting attendance and proxy meeting attendance between treatment firms (i.e., firms with D&O insurance coverage) and control firms 1 year before and after the event (i.e., first-time purchase).

FIGURE 3
Difference in Diligence



Note: This figure depicts difference in the diligence score and control firms 1 year before and after the event (i.e., first-time purchase).

FIGURE 4
Difference in Busyness



Note: This figure depicts difference in the board busyness between treatment firms (i.e., firms with D&O insurance coverage) and control firms 1 year before and after the event (i.e., first-time purchase).

Table 6
Initiation of D&O Insurance Coverage

Dependent Variable	*ΔPersonal Attendance*	*ΔProxy Attendance*	*ΔAttendance Problem*	*ΔMin(Personal _Attendance)*	*ΔMax(Proxy _Attendance)*	*ΔDiligence Score_tf.idf*	*ΔDiligence Score_prop*	*ΔBusy Board*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
D&O	−0.031*	0.024	0.327***	−0.108**	0.064*	−0.434**	−0.006**	0.180*
	(−1.668)	(1.528)	(3.006)	(−2.432)	(1.805)	(−2.060)	(−2.019)	(1.689)
ΔBoardsize	−0.289**	0.230**	2.105***	−0.748***	0.655***	0.687	0.014	−0.610
	(−2.423)	(2.542)	(3.375)	(−2.966)	(3.220)	(0.861)	(1.398)	(−0.934)
ΔMgmt Comp	0.034	−0.058	−0.046	0.076	−0.093	0.861	0.017***	−0.060
	(0.647)	(−1.143)	(−0.158)	(0.683)	(−0.907)	(1.195)	(2.741)	(−0.182)
ΔInst Investor	0.008	−0.009	−0.110**	0.024	−0.024*	−0.042	0.000	−0.046
	(1.140)	(−1.570)	(−2.216)	(1.354)	(−1.720)	(−0.614)	(0.597)	(−0.586)
ΔInst Ownership	−0.001	0.002	−0.006	0.000	0.001	0.030	0.000	0.003
	(−0.470)	(1.033)	(−0.499)	(0.011)	(0.497)	(1.451)	(0.654)	(0.194)
ΔLargest Shareholding	−0.002	0.002	0.033**	−0.002	0.002	−0.007	0.000	−0.017
	(−0.834)	(0.825)	(2.040)	(−0.546)	(0.400)	(−0.232)	(0.242)	(−1.027)
ΔLeverage	−0.199	0.277*	0.989	−0.510	0.725**	−2.289	0.003	0.470
	(−1.210)	(1.941)	(0.922)	(−1.480)	(2.634)	(−1.072)	(0.124)	(0.303)
ΔAssets	0.038*	−0.045**	−0.199	0.117**	−0.139***	1.111***	0.008**	0.055
	(1.892)	(−2.486)	(−1.227)	(2.367)	(−3.405)	(3.259)	(2.300)	(0.354)
ΔROA	−0.708***	0.660***	4.468***	−1.632***	1.405***	−3.591	0.026	−1.308
	(−2.745)	(2.864)	(2.724)	(−2.990)	(3.195)	(−0.959)	(0.807)	(−0.980)
ΔRelated Party	0.426**	−0.374***	−2.708***	1.229***	−1.016***	1.197	0.003	0.121
	(2.629)	(−3.011)	(−2.869)	(3.259)	(−4.492)	(0.613)	(0.146)	(0.182)

(*Continued*)

TABLE 6
Continued

Dependent Variable	*ΔPersonal Attendance* (1)	*ΔProxy Attendance* (2)	*ΔAttendance Problem* (3)	*ΔMin(Personal _Attendance)* (4)	*ΔMax(Proxy _Attendance)* (5)	*ΔDiligence Score_tf.idf* (6)	*ΔDiligence Score_prop* (7)	*ΔBusy Board* (8)
Constant	0.030*	−0.020*	−0.164*	0.048	−0.020	0.145	0.001	−0.091
	(1.826)	(−1.711)	(−1.839)	(1.544)	(−0.938)	(0.844)	(0.425)	(−1.133)
Observations	82	82	82	82	82	82	82	82
Adjusted R^2	0.11	0.14	0.23	0.14	0.17	0.14	0.07	0.04

Notes: This table presents the regressions on change in independent director behavior surrounding first-time purchase of D&O insurance coverage. For each treat firm that purchases D&O insurance coverage for the first time, we match it with a control firm in the year prior to the event (i.e., D&O insurance purchase) using the propensity score matching approach. The dependent variables, *ΔPersonal Attendance*, *ΔProxy Attendance*, *ΔAttendance Problem*, *ΔMin(Personal_Attendance)*, *ΔMax(Proxy_Attendance)*, *ΔDiligenceScore_prop*, *ΔDiligenceScore_tf.idf*, and *ΔBusy Board*, are differences in independent director meeting attendance, diligence score, and busyness (i.e., year 1 to year −1) for treatment and control firms. The independent variables are also calculated as differences between year 1 and −1 (i.e., year 1 to year −1) for treatment and control firms. Definitions of other variables are provided in the Appendix. *T*-statistics based on heteroskedasticity-robust standard errors are displayed in parentheses. ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively.

affect changes in independent director behavior. We find that D&O insurance purchase significantly and negatively relates to changes in personal attendance and diligence score, and positively relates to changes in attendance problem and board busyness. We also document a significantly negative (positive) association between D&O insurance purchase and change in personal attendance (proxy attendance) among directors with the lowest personal attendance (the highest proxy attendance) record at each firm. Findings of this analysis suggest that a causal effect appears to be at least partially in effect.

Corporate Governance Implications

In this section, we turn our attention to the impact of D&O insurance coverage on independent directors' governance effectiveness. To the extent that D&O insurance introduces unintended moral hazard into the boardroom and encourages independent directors to act less responsibly in carrying out fiduciary duties on behalf of minority shareholders, we expect D&O insurance to weaken the merit and effectiveness of independent directors as a core internal corporate governance mechanism. To test our conjecture, we use the following model:

$$\begin{aligned} Tobin's\ Q(Violation) = {} & \alpha + \beta_1\, Independent\_Dummy + \beta_2 D\&O \\ & \times Independent\_Dummy + \beta_3 D\&O + \lambda' Firm\ Control \\ & + \delta' Board\ Control + \varepsilon, \end{aligned} \tag{4}$$

where the dependent variable is either firm performance as measured by *Tobin's Q*, or *Violation*, a dummy variable that equals 1 if a firm is in violation of law or regulation in a year. The main variable of interest of this analysis is *D&O* × *Independent_Dummy*, where *Independent_Dummy* equals 1 if the percentage of independent directors at a firm in a given year is above the base requirement of CSRC regulation (i.e., one-third), and 0 otherwise.

Table 7 presents the regression results estimating Equation (4). The dependent variable is *Tobin's Q* in column (1). Consistent with Bai et al. (2004), we document a positive and significant relation between *Independent_Dummy* and firm performance. More importantly, the coefficient estimate on the interaction term *D&O* × *Independent_Dummy* is negative and significant at the 5 percent level. This finding suggests that D&O insurance mitigates the contribution of independent directors to firm performance. Column (2) reports results on firm regulatory violation. We document a negative and significant relation between *Independent_Dummy* and *Violation*, suggesting that independent directors discipline management that results in a lower propensity of misconduct. The coefficient estimate on the interaction term *D&O* × *Independent_Dummy* is significantly positive.[28] Together, these findings provide

[28]Ai and Norton (2003) note that the interpretation of interaction effects in logit and probit models can be problematic. So we employ the Stata procedure recommended by Norton et al. (2004) and used in many studies, such as Lee et al. (2012), Leuz et al. (2008), and Kim and Zhang (2016), and report the results in column (2) in Table 7.

TABLE 7
D&O Insurance Coverage and Independent Director's Governance Effect

	Tobin's Q	*Violation*
Dependent Variable	(1)	(2)
D&O	0.116**	−1.467**
	(2.014)	(−2.058)
Independent_Dummy	0.208*	−0.532**
	(1.684)	(−2.453)
D&O × Independent_Dummy	−0.314**	1.996*
	(−2.062)	(1.931)
Boardsize	−0.393**	−0.469
	(−2.197)	(−0.748)
Duality	0.131	−0.361
	(1.161)	(−0.887)
Mgmt Comp	0.620***	1.246***
	(4.529)	(3.168)
Inst Investor	0.081*	−0.067
	(1.882)	(−0.436)
Inst Ownership	0.016***	−0.003
	(2.670)	(−0.159)
Largest Shareholding	0.004	−0.010
	(0.918)	(−0.512)
Leverage	−0.292	3.242***
	(−1.486)	(3.134)
Assets	−0.389***	−0.354
	(−6.228)	(−1.541)
ROA	2.603***	−4.044
	(2.740)	(−1.279)
Related Party	−0.721	−1.814
	(−1.334)	(−0.600)
SOE	0.020	0.774***
	(0.341)	(2.977)
Constant	4.927***	−16.464***
	(7.794)	(−6.372)
Industry fixed effect	Included	Included
Year fixed effect	Included	Included
Observations	742	742
Adjusted R^2/Pseudo R^2	0.57	0.21

Notes: This table reports regression results of D&O insurance coverage on the governance effect of independent director based on firms with D&O coverage and a sample of propensity-score-matched firms. The dependent variable is *Tobin's Q*, calculated as firm's market value divided by (book value of total assets minus intangible assets) in a given year, and *Violation*, a dummy variable that equals 1 if a firm is in violation of law or regulations in a given year, respectively. Definitions of other variables are provided in the Appendix. *T*- or *z*-statistics based on heteroscedasticity-robust standard errors and clustering at the firm level are displayed in parentheses. ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively.

support that D&O insurance coverage adversely affects independent directors' governance effectiveness.

Conclusion

In this article, we examine the effect of D&O insurance coverage on the behavior of independent directors and the effectiveness of their governance role. We study three measures of independent directors' efforts—board meeting attendance, diligence level as manifested in their opinion reports, and level of busyness. Using a sample of Chinese companies and the propensity score matching method, our findings suggest that D&O insurance introduces moral hazard into the boardroom and encourages independent directors to behave in a less diligent and responsible manner. Specifically, we document a negative relation between D&O insurance coverage and personal meeting attendance by independent directors and a positive relation between D&O insurance coverage and meeting attendance by authorized representatives. The net effect on meeting participation is negative as insured independent directors tend to experience greater attendance problem than their uninsured peers. We also find that D&O insurance reduces the incentives of independent directors to exert effort as reflected in their opinion reports. Moreover, we find that insured independent directors are generally becoming busier and they are more inclined to take on additional directorships at other firms. An analysis of independent director behavior before and after the first-time purchase of D&O insurance suggests that a causal effect is at least partially in effect. The additional analyses also show that D&O insurance coverage compromises the governance role of independent directors by reducing their effectiveness in improving firm value and curbing firm's regulatory infringement.

In summary, the empirical results suggest that shielding directors from litigation risk and personal financial liability through D&O insurance appears to induce moral hazard in the boardroom and undermine internal corporate governance. Our article provides new insights for the debate concerning the governance effect of D&O insurance. It also provides new evidence on the incentives of independent directors and highlights the role of personal liability exposure in disciplining them.

Our study is subject to several caveats. First, because of limited history and market penetration of D&O insurance in China, our sample of firms with D&O insurance is small compared to the United States and Canada. However, it is important to notice the growth trend in the breadth of coverage over time. In addition, our sample offers unique advantages in that it provides rich and detailed data on independent director behavior, which is not readily available in other countries. Another advantage of examining Chinese firms is that it allows us to compare the behavior of independent directors *with* and *without* D&O insurance and examine *changes* in director behavior surrounding the initiation of D&O insurance coverage so that we can directly assess how D&O insurance *alters* independent director behavior. In contrast, given the long history and broad coverage of D&O coverage in Western countries such as the United States and Canada, it is difficult to find a sample of uninsured firms and compare their performance with those of insured firms, especially surrounding the first-time purchase of D&O insurance coverage, so scholars rely primarily on abnormal

coverage as the main measure in their analyses (e.g., Kalelkar and Nwaeze, 2015). A second caveat of our study is that the decision to purchase D&O insurance depends on the expected benefits as well as the associated costs. In this study, we document only one dimension of cost pertaining to the internal corporate governance. Other dimensions of benefits and costs of D&O insurance are fruitful directions for future research.

APPENDIX: DEFINITION OF VARIABLES

Variable	Definition
Firm characteristics	
$D\&O_t$	A dummy variable that equals 1 if independent directors are covered by the D&O insurance in year t
$Mgmt\ Comp_t$	Total compensation that a firm pays out to the top three managers scaled by book value of total assets measured at the end of year t
$Assets_t$	Natural logarithm of book value of total assets, measured at the end of year t
$Leverage_t$	Book value of debt divided by book value of total assets measured at the end of year t
ROA_t	Net income divided by book value of total assets measured at the end of year t
$Tobin's\ Q_t$	Tobin's Q, calculated as firm's market value divided by (book value of total assets minus intangible assets) in year t
SOE_t	A dummy variable that equals 1 if a firm is a state-owned enterprise in year t
$Inst\ Investors_t$	Natural logarithm of number of institutional investors in year t
$Inst\ Ownership_t$	Institutional holdings (%) for a firm over year t
$Largest\ Shareholding_t$	Shareholdings (%) of largest shareholder divided by the sum of shareholdings (%) by the second to fifth largest shareholders over year t
$Related\ Party_t$	Amount of related party transactions scaled by book value of total assets measured at the end of year t
$Violation_t$	A dummy variable that equals 1 if a firm is in violation of law or regulation in year t
Board characteristics	
$Personal\ Attendance_t$	Percentage of board meetings that an independent director personally attends in year t, averaged across independent directors in a given firm
$Proxy\ Attendance_t$	Percentage of board meetings that an independent director appoints an authorized representative to attend in year t, averaged across independent directors in a given firm
$Attendance\ Problem_t$	A dummy variable that equals 1 in fiscal year t if a firm has at least one independent director who personally attends fewer than 75 percent of the board meetings he/she is supposed to during that year

(*Continued*)

Appendix

Continued

Variable	Definition
$Min(Personal\_Attendance)_t$	Percentage of board meetings that an independent director personally attends in year t, taking the minimum among independent directors in a given firm
$Max(Proxy\_Attendance)_t$	Percentage of board meetings that an independent director appoints an authorized representative to attend in year t, taking the maximum among independent directors in a given firm
$DiligenceScore\_prop_t$	Director diligence score constructed from independent director opinion reports, measured by the ratio of the word count in *Diligence Dictionary* and the total number of words in the opinion report, averaged across opinion reports in year t
$DiligenceScore\_tf.idf_t$	Director diligence score in year t, constructed from independent director opinion reports by using Equation (i) in the text
$Busy\ Board_{t+1}$	A dummy variable that equals 1 if a firm has more than one-half of independent directors holding three or more directorships in listed companies in year $t+1$
$Independent\_Dummy_t$	A dummy variable that equals 1 if the percentage of independent directors in a firm in year t is above the base requirement of CSRC regulation (i.e. one-third)
$Boardsize_t$	Natural logarithm of number of directors in a firm in year t
$Duality_t$	A dummy variable that equals 1 if CEO is also the chairman of the board in year t
Director characteristics	
$Personal\ Attendance\_Dir_t$	Percentage of board meetings that the independent director personally attends in year t
$Proxy\ Attendance\_Dir_t$	Percentage of board meetings that the independent director appoints an authorized representative to attend in year t
$Attendance\ Problem\_Dir_t$	A dummy variable that equals 1 if the independent director personally attends fewer than 75 percent of the board meetings he/she is supposed to in year t
$DiligenceScore\_prop\_Dir_t$	Director-level diligence score constructed from independent director opinion reports, measured by the ratio of the word count in *Diligence Dictionary* and the total number of words in the opinion report, averaged across opinion reports in year t
$DiligenceScore\_tf.idf\_Dir_t$	Director-level diligence score in year t, constructed from independent director opinion reports by using Equation (i) in the text, averaged across opinion reports in year t
$Busy\_Dir_{t+1}$	A dummy variable that equals 1 if the independent director is busy (i.e., holds three or more directorships in listed companies) in year $t+1$

(*Continued*)

APPENDIX

Continued

Variable	Definition
Financial Expertise_Dir$_t$	A dummy variable that equals 1 if the independent director has financial expertise (experience as a public accountant, auditor, principal or chief financial officer, controller, or principal or chief accounting officer) in year *t*
Location_Dir$_t$	A dummy variable that equals 1 if the independent director resides in the same province as the firm in year *t*
Gender_Dir	A dummy variable that equals 1 if the independent director is a female
Age_Dir$_t$	A dummy variable that equals 1 if the independent director is above 60 years old by the end of year *t*
Compensation_Dir$_t$	Director compensation, defined as the natural logarithm of (1 + total compensation) in year *t*
Tenure_Dir$_t$	Director tenure, defined as the natural logarithm of (1+ number of years the independent director has served on the board) by the end of year *t*
Reputation Incentive_Dir$_t$	Director reputation incentive, defined as the difference in the natural logarithm of total assets between the current firm and the director's smallest directorship in year *t*; if the director has no other directorships, the variable equals the natural logarithm of book value of total assets of the current firm in year *t*
Serve_Multi_Dir$_t$	A dummy variable that equals 1 if the independent director serves on more than one board in year *t*

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