

追尋優秀獨立董事： 董監事責任險之角色

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摘要

本研究探討董監事責任險是否能在公司尋求優秀獨立董事時，作為有效的工具，而優秀獨立董事係指符合下列三條件之一者：(1)具備碩士或以上學歷，或(2)身兼三間或以上之董事職位，或(3)符合財務或會計專業人員資格。本研究發現，「購買董監事責任險」與「優秀獨立董事百分比」為顯著正相關，而「購買董監事責任險」與「獨立董事自願離職」為顯著負相關。整體而言，本研究的實證結果支持董監事責任險有助於公司聘任優秀獨立董事、並維持董事會穩定性，此應亦為董監事責任險持續普及的原因之一。

關鍵詞：董監事責任險、獨立董事、聘任、辭職

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The Quest for Talented Independent Directors: The Role of Directors' and Officers' Liability Insurance

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Abstract

This study explores whether directors' and officers' liability insurance (D&O insurance) is an effective tool in firms' quest for talented independent directors, that is, those who are highly educated, well-connected, or financial experts. We find that firms with D&O insurance are better able to recruit talented independent directors, supporting that the protection provided by D&O insurance is determinative when talented individuals are deciding whether to join a board. We also show that D&O insurance reduces the incidence of independent directors' resignation. Collectively, our evidence suggests that D&O insurance helps firms maintain a board with superior competence and greater stability, which also explains the wide prevalence of D&O insurance in practice.

Keywords: *Directors' and officers' liability insurance, Independent directors, Recruit, Resignation.*

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1. INTRODUCTION

The board of directors is one of the most important governance mechanisms in business organizations (Blair 1995). Specifically, independent directors play a monitoring role that curbs opportunistic behaviors, which leads to reduced agency costs and which benefits shareholders (Walsh and Seward 1990; Conyon and Peck 1998; Luan and Tang 2007). However, board members can be held legally liable due to claims that may arise from the decisions made and actions taken within the scope of regular duties (Johnson, Daily, and Ellstrand 1996), which makes recruiting and retaining capable independent directors in the current litigious environment challenging (Holderness 1990; Cao and Narayanamoorthy 2014). In Taiwan, according to Securities and Futures Investors Protection Center, the number of independent directors who are named as defendants in class actions due to financial irregularities totals 31, and the amount of recourse adds up to roughly NTD 6 billion (Commercial Times 2018). In addition, as anecdotal evidence, the verdicts of the lawsuits against Ya Hsin Industrial and Kaibo Enterprise have confirmed that the independent directors should bear proportional liability for investors' financial investment loss. In practice, directors' and officers' liability insurance (hereafter, D&O insurance) has been introduced, which is purchased by firms to protect directors and officers from personal liability in the event of litigation brought by stakeholders (O'Sullivan 1997). However, there is scant empirical evidence about whether D&O insurance is effective as a tool in the recruitment of talented independent directors; the current study attempts to fill this void.

We propose that providing D&O insurance is imperative when recruiting talented independent directors for the following reasons. First, the literature reveals that, from the perspective of candidate directors, holding such positions without the protection of D&O insurance is no different from accepting unlimited litigation risks in the current highly litigious environment, which adversely affects a firm's ability to attract suitable outsiders to serve on boards (Priest 1987; Daniels and Hutton 1993). In particular, independent directors typically also serve as experienced professionals in other firms or large organizations and, therefore, care about their reputation (Fama and Jensen 1983); hence, the provision of appropriate D&O insurance is essential for recruiting and retaining talented independent directors (Boyer and Stern 2012; Lin, Officer, Wang, and Zou 2013). Second, practitioners' viewpoints strongly suggest the pertinence of D&O insurance in recruiting capable board members. Large-scale surveys generally report that many highly capable directors are reluctant to accept positions without first enquiring whether the company provides D&O insurance (MLR Holdings 2007; Allianz 2010; Towers Watson 2012). Human resources departments, recruitment consultants, and those tasked with attracting the best talent must often make clear the availability of D&O insurance during

the director recruitment process in order to build an appropriate talent pool (Asia Insurance Review 2014; Financier Worldwide Magazine 2016).

Building on prior studies, we define a director as talented if he or she is highly educated (D'Aveni 1990; Wiersema and Bantel 1992; Certo 2003; Wang, Su, Wang, and Chen 2017), holds more directorships (Carpenter and Westphal 2001; Sarkar and Sarkar 2009; Tian, Haleblan, and Rajagopalan 2011; Field, Lowry, and Mkrtychyan 2013), or possesses financial expertise (Pfeffer 1972; Stearns and Mizruchi 1993; Abdelbadie and Salama 2019). Our analysis indicates that firms with D&O insurance have a greater proportion of talented independent directors sitting on the board than do firms without D&O insurance. We also ascertain whether D&O insurance helps firms retain independent directors by relating D&O insurance to the departure decisions and find that the likelihood of independent directors resigning from the board within the term is lower in the presence of D&O insurance. Therefore, the results highlight that D&O insurance is effective in recruiting talented independent directors and helps firms maintain board stability. Our empirical models take into account the factors that may affect the board structure or directors' departure decisions, and we conducted additional tests to address the potential endogeneity issue. Overall, from a practical perspective, D&O insurance brings substantial benefits by enabling firms to establish a board composed of more talented independent directors with a relatively low turnover rate.

This study adds the following contributions to the board literature and the practice in recruiting and retaining talented professionals. First, it is the first study that examines whether D&O insurance helps recruit highly capable people to serve on boards of directors and whether it is an effective retention tool. While prior studies focused on how D&O insurance affects firm performance, our study addresses the unanswered issue of whether the original intended benefit of introducing D&O insurance is attained. Second, our results coincide with the fact that D&O insurance is still strongly emphasized by most practitioners and explain why it has gained prevalence in most parts of the world. Third, our empirical findings are of particular interest to regulators concerning whether to encourage or discourage the purchase of D&O insurance. Although many jurisdictions maintain neutrality about D&O insurance, some have explicit preferences. For example, Germany passed the Act on the Adequacy of Managerial Salaries in 2009, which requires listed firms that have purchased D&O insurance for their executives to impose a personal deductible, borne by the insured person, equivalent to at least 10% of the relevant loss. The practical interpretation of this act is that the regulator believes that D&O insurance may cause more insurance claims and that some regulatory measures should therefore be put in place (LaCroix 2009; Wessing 2009). By contrast, the Hong Kong Exchange (HKEX) requires listed firms to arrange appropriate insurance coverage for legal action against their directors (HKEX 2016). Eventually, it is reported that roughly 50% of Taiwanese firms'

independent directors are paid less than NT \$500,000 annually, while the litigation risk has risen significantly recently and the number of independent directors resigning from the board has considerably increased during the 2014-2018 period (Taiwan News 2017; Anue 2019; Liberty Times Net 2019). Hence, our evidence clearly informs firms of the necessity of providing D&O insurance in order to grab and retain high quality independent directors.

The rest of this paper is organized as follows. Section 2 examines the related literature to develop the conceptual framework for the role of D&O insurance in recruiting and retaining talented independent directors. Section 3 describes the empirical model, data, and sample. Section 4 presents the empirical results and provides a discussion of the implications of these results. Finally, Section 5 offers concluding remarks, with related research limitations and suggestions for future research.

2. CONCEPTUAL FRAMEWORK

2.1 The D&O Insurance Market

When firms are faced with lawsuits, many of them—typically under an indemnification arrangement—reimburse directors and officers for the costs of lawsuits. D&O insurance in turn reimburses the firm for these costs. D&O insurance usually provides both corporate and personal coverage. Corporate coverage reimburses the firm when the firm indemnifies directors or officers for the costs of a suit. Personal coverage provides direct payment to directors or officers when the firm is not able to indemnify them for legal reasons or because of financial distress. D&O insurance was introduced in the London insurance market in the late 1930s, and it gradually gained acceptance during the mid to late 1980s (LaCroix 2016). In particular, the growing risk of being the target of legal action in the recent litigious business environment has contributed to the increased prevalence of D&O insurance (Allianz 2010; ECODA 2015). In all, the D&O insurance market amounts to approximately USD 10.5 billion of premium volume, with the United States (US) market representing around 60% of total business. Europe is the second largest region, with an estimated market share of 25% (i.e., USD 2.6 billion). Asia Pacific, Canada, and Latin America follow, with stable and low single-digit figures (Deakin, Riss, and Koziol 2018).

2.2 Previous Literature and Hypothesis Development

Existing studies are divided between documenting the positive side and the negative side of D&O insurance. On the positive side, some argue that firms may introduce the monitoring provided by D&O insurance firms in underwriting through scrutiny of a firm's corporate governance after purchasing D&O insurance. Hence, firms with D&O insurance may enjoy a comparative advantage in receiving claim adjudication or settlement services (Mayers and Smith 1982), have a lower likelihood of bankruptcy (Core 1997; Zou and

Adams 2008), or are associated with reduced crash risk (Yuan, Sun, and Cao 2016). On the negative side of D&O insurance, some posit that D&O insurance may induce unintended moral hazard because it insulates directors and officers from litigation risk. This strand of literature documents that firms with D&O insurance are associated with increased cost of capital (Lin et al. 2013; Chen, Li, and Zou 2016), experience poorer mergers and acquisition outcomes (Lin, Officer, and Zou 2011), and are less likely to appoint Big Four accounting firms (Chi and Weng 2014).

However, few, if any, existing studies have empirically addressed the unanswered question of whether D&O insurance plays a decisive role in recruiting talented directors. Such investigation is critical for at least two reasons. First, D&O insurance is originally introduced to recruit highly competent independent directors (Holderness 1990; O'Sullivan 1997), but it is still unclear whether the original intended benefits are attained. Second, in recent decades, independent directors have played a key role in enhancing the effectiveness of boards and mitigating agency problems. If we find that the D&O insurance is an important factor in determining whether talented independent directors are willing to join a board, it suggests that firms are able to form a highly competent board and improve the soundness of corporate governance by providing D&O insurance policies.

It is widely accepted that D&O insurance plays a decisive role in recruiting capable independent directors. The literature reveals that, from the perspective of candidate directors, holding such positions without the protection of D&O insurance is no different from accepting unlimited litigation risks in a highly litigious environment. The fear of personal liability reduces the number of risk-averse individuals willing to serve as directors, and protective measures such as D&O insurance help solve this problem (Priest 1987; Daniels and Hutton 1993; O'Sullivan 1997). It is also emphasized that D&O insurance is a key consideration for directors when deciding whether to join a board (Boyer and Stern 2012; Lin et al. 2013) and is viewed as a part of independent directors' compensation package (Core 1997).

Practitioners also constantly contend the pertinence of D&O insurance in recruiting capable board members. For example, Walter Wriston, a former chief executive of Citigroup and director of nine firms, highlights the necessity of D&O insurance to board members: "I don't know of anybody who would join a board without [liability] insurance." Dave Berkus, a well-known American angel investor and venture capitalist, also notes, "I won't serve on a board without D&O insurance!"¹ Large-scale surveys also generally report that many capable directors are reluctant to accept positions without first enquiring whether firms provide D&O insurance (Allianz 2010; Towers Watson 2012). American International Group (AIG) (2014) also stated that having proper D&O insurance is a

¹ See <https://berkonomics.com/?p=3336> for details

prerequisite for recruiting top directors. Based on the above reasoning, we put forward the following H1.

H1: Firms with D&O insurance are better able to recruit talented independent directors.

3. DATA AND METHODOLOGY

3.1 Data and Sample Description

In this study, we use D&O insurance data from Taiwan because while there is no complete mandatory disclosure of D&O insurance in most countries, including the US, publicly traded firms in Taiwan are required to disclose whether they purchase D&O policies in annual reports (Chi and Weng 2014). The prevalence of D&O insurance in Taiwan is higher than that in Korea, Singapore, and China, while it is less than that in Hong Kong (AIG 2016). Taiwan fully adopted the International Financial Reporting Standards after the fiscal year ending December 31, 2013. To avoid the potential effect that financial statement data are subject to changes in accounting standards, our sample period starts from the 2013 fiscal year. Meanwhile, according to the Company Act in Taiwan, the term of directors is generally three years. Hence, our sample period covers three years from 2013 to 2015. The initial sample consists of all firms publicly traded on the Taiwan Stock Exchange (TSE) or Taipei Exchange (TPEX), while firms in the financial and regulated sectors are excluded.

Then, in order to precisely capture the importance of D&O insurance in recruiting talented independent directors, we identify the firm-years in which the reelection of the board of directors occurred in the initial sample. That is, for the 2013–2015 period, an observation is included in our sample of when there were reelections of the board of directors in the given year, resulting in 1,059 firm-year observations. We exclude observations with missing data on financial metrics and winsorize all continuous variables at the 1 and 99 percent levels. As such, we obtain a total of 973 firm-year observations to test whether D&O insurance helps recruit talented independent directors. The data on firm characteristics, director traits, and D&O insurance are collected from the Taiwan Economic Journal (TEJ) database, and we summarize the sample construction procedure in Table 1.

Table 1 Sample Construction

The number of firms with independent director election from 2013 to 2015	1,059
Less:	
Observations without necessary financial data	<u>(126)</u>
Number of firms in the final sample	973

Notes: The table summarizes the sample construction process for testing relationship between D&O insurance and recruiting talented independent directors.

3.2 Research Models and Variables

3.2.1 Definition of a talented independent director

We define a talented independent director as a person with a high educational level, an expanded network, or financial expertise, for at least three reasons. First, prior studies in the field of management suggest that an individual's level of education reflects his or her cognitive ability and skills, and high levels of education are associated with a greater capacity for information processing and ability to discriminate among a variety of stimuli. For instance, Bantel and Jackson (1989) find that top management teams with high levels of education head innovative banks. Kimberly and Evanisko (1981) show that high levels of education are associated with receptivity to innovation. D'Aveni (1990) points out that an elite educational background is indicative of the prestige of a firm's top management. Wiersema and Bantel (1992) document that firms with management teams who have a high educational level are more likely to undergo changes in corporate strategy. Certo (2003) argues that educational background serves well as a criterion in recruiting because potential employers can verify educational degree, as it is costly and difficult to imitate. Wang et al. (2017) indicate that the appointment of highly educated board members can signal to potential investors and lenders that the firm is a legitimate enterprise worthy of support, which in turn helps reduce the cost of external capital.

Second, even if one is not highly educated, he or she is still able to develop expertise through experience accumulation in a professional career to access a quantity of knowledge about operations, strategy, and finances at related firms. Independent directors who hold multiple directorships learn about the efficacy of different practices and the way to implement them properly by observing the consequences of management decisions. They can also learn about business practices through communication with other directors in board and committee meetings; information acquired from fellow directors may be particularly influential because it often comes from a trusted source (Useem 1982; Davis 1991). Carpenter and Westphal (2001) propose that, given that directors are faced with extreme information complexity in evaluating decisions, they can be expected to rely heavily upon knowledge and skills developed through experience in similar roles. Tian et al. (2011) indicate that firms are better able to obtain valuable strategic information from the external environment if they recruit independent directors with more directorship ties with other firms. Field et al. (2013) point out that directors who hold multiple directorships are excellent advisors and contribute to increased firm values. Sarkar and Sarkar (2009) document that independent directors with multiple directorships attend more board meetings and are more likely to be present in a firm's annual general meeting; hence, the presence of such independent directors enhances firm value.

Third, the duties and responsibilities of independent directors cover a large range of accounting and finance subjects, and directors with financial expertise (i.e., discipline or experience) are more able to effectively play the monitoring role. For instance, Xie, Davidson III, and DaDalt (2003) find that board and audit committee members with financial backgrounds are more likely to associate with firms that have smaller earnings manipulation because they are more familiar with financial issues, accounting numbers, and related irregularities. Agrawal and Chadha (2005) document that the presence of independent directors with financial backgrounds is negatively related to the incidence of accounting scandals. Chan, Faff, Khan, and Mather (2013) show that independent directors with financial backgrounds enhance the governance of high-growth firms by facilitating the more accurate and timely reporting of management's earnings forecasts. In addition, directors with financial backgrounds or experience benefit firms by extending the borrowing capacity. For instance, Pfeffer (1972) indicates that the availability of outside capital is enhanced by directors from financial institutions. Booth and Deli (1999) posit that directors who are also commercial bankers benefit firms by offering general debt-market expertise (i.e., offering a comparative advantage in evaluating alternative debt contracts and pricing arrangements) and find that the presence of such directors is positively related to a firm's use of debt. Stearns and Mizruchi (1993) show that the amount of funds borrowed by firms is positively associated with the presence of directors with financial expertise.

3.2.2 Estimation equation for testing the effect of D&O insurance on recruiting talented independent directors

We estimate Model (1) to investigate whether D&O insurance helps firms recruit talented independent directors. The subscript i in Model (1) indexes individual firms, and subscript t indicates the year.

$$\begin{aligned}
 PCP_{i,t} = & \alpha_0 + \alpha_1 DOLI_{i,t} + \alpha_2 SIZE_{i,t} + \alpha_3 ROA_{i,t} + \alpha_4 LEV_{i,t} + \alpha_5 GROWTH_{i,t} \\
 & + \alpha_6 PPE_{i,t} + \alpha_7 AGE_{i,t} + \alpha_8 RDR_{i,t} + \alpha_9 FREECFO_{i,t} \\
 & + \alpha_{10} SDRET_{i,t} + \alpha_{11} BSIZE_{i,t} + \alpha_{12} CEOTNR_{i,t} + \alpha_{13} DUALITY_{i,t} \\
 & + Industry\ fixed\ effects + Year\ fixed\ effects + \varepsilon_{i,t}.
 \end{aligned} \tag{1}$$

PCP is equal to the number of talented independent directors divided by the total number of independent directors. An independent director is defined as talented if he or she (1) has a master's degree or higher, (2) holds three or more directorships,² or (3) is a

² Article 4 of the Regulations Governing the Appointment of Independent Directors and Compliance Matters for Public Companies in Taiwan stipulates that no independent director of a public company may concurrently serve as an independent director of more than three other public companies. No restriction is made regarding the number of non-independent director positions that an independent director can server on other companies' boards. Hence, it is possible for an independent director to concurrently hold directorships in more than three other companies.

financial expert. An independent director is a financial expert if he or she has a financial or accounting background (i.e., discipline or experience).³ A greater value of *PCP* indicates that more of the firm's independent directors are highly educated, well-connected, or financial experts. The primary variable of interest, *DOLI*, is equal to 1 if a firm provides D&O insurance policies in the election year⁴ and 0 otherwise. Our hypothesis predicts that α_1 is positive⁵. Notably, because a firm has more than one director in a given year, if we estimate the model at the director level, the number of observations included in estimating Model (1) would differ among firms.

Several control variables are included based on prior studies that analyze the determinants of board structure (Fama and Jensen 1983; Baysinger and Hoskisson 1990; Booth and Deli 1999; Fich and Shivdasani 2006; Boone, Field, Karpoff, and Raheja 2007; Linck, Netter, and Yang 2008; Lehn, Patro, and Zhao 2009; Field et al. 2013). These variables mainly reflect a firm's need for advice and access to resources, the tradeoff between the benefits and costs of monitoring managers, and the power struggle between the chief executive officer (CEO) and directors. Specifically, *SIZE* is the natural logarithm of the market value of equity, which measures the size effect and the degree of operation complexity. *ROA* is the return on average total assets and serves as the proxy for performance. *LEV* is the debt ratio, which measures the level of leverage. *GROWTH* is the ratio of market value of common equity to book value of common equity, and *PPE* is the ratio of the property, plant, and equipment to the total assets. Greater values of *GROWTH* or *PPE* usually relate to a greater need for advice and resources than lower values. *AGE* is the number of years since the firm was founded. Linck et al. (2008) suggest that although the complexity of operation may increase with firm age, it is unclear whether that complexity increases with firm age once a firm is "mature." Hence, the expected sign of *AGE* is unclear. *RDR* is the ratio of a firm's research and development (R&D) expenditure to net sales. Relatively high *RDR* firms are more likely to demand capable directors because they will benefit from such directors' wide social networks and financial, accounting, or domain knowledge.

³ For instance, certified public accountants (CPAs), auditors, chief financial officers (CFOs), controllers, financial consultants, investment bankers, investment managers, bankers, and chief executive officers (CEOs) of financial firms are examples of financial experts.

⁴ It is reasonable to expect that when a candidate director decides whether to serve on a board, he or she considers whether the firm purchases D&O insurance instead of D&O insurance coverage. Moreover, because different candidate directors have varying aversions to risk (i.e., directors vary in how much it would impair their reputation in case of litigation), D&O insurance coverage may be sufficient for some candidate directors and insufficient for others. Therefore, we believe that the presence of D&O insurance, rather than the amount of D&O insurance coverage, is a more appropriate variable in our context.

⁵ Taiwanese regulators introduced a legal reform requiring that non-financial companies with a paid-in-capital of more than NTD 10 billion establish audit committees starting from December 31, 2013. The law also requires at least one director on the audit committee to have a finance or accounting background. We expect that the enforcement of this requirement would weaken our empirical findings. So, if we still find a significant effect of D&O insurance on the percentage of directors with financial/ accounting expertise on boards of directors, it suggests that D&O insurance is substantially influential.

Free cash flow (*FREECFO*) is defined as operating income before depreciation minus total income taxes, changes in deferred taxes, interest expenses, preferred dividends, and dividends on common stock divided by total assets; it captures the degree of growth. High-growth firms usually have lower free cash flows and may have a greater need for advice than do low-growth firms. Similarly, when a firm engages in high-risk business, its need for advice increases. Hence, we use the standard deviation of monthly stock returns during the year (*SDRET*) to account for the effect of operating risks. Additionally, *BFSIZE* stands for the natural logarithm of the number of directors on the board, and captures the effect of firm size and operation complexity. Finally, the capacity or influence of CEOs may complement or substitute the efforts of directors, and two variables are used to account for such effect. CEO tenure (*CEOTNR*) is the number of years the CEO has been in this role, and CEO duality (*DUALITY*) equals 1 if the CEO is also the chairperson of the board. Industry and year dummies are included to capture industry and temporal effects.

4. ANALYSES AND FINDINGS

4.1 Descriptive Results

Table 2 shows the descriptive statistics of the variables in Model (1). On average, among the sample firm's independent directors, the percentage of directors with a master's or higher degree is 71%, the percentage of well-connected directors is 25.5%, and the percentage of directors with financial expertise is 31.8%. Besides, 72% of the sample observations purchase D&O insurance. Table 3 presents the means, medians, and standard deviations of all variables, presented by the status of the purchase of D&O insurance. Chen and Pang (2008) find that the primary reasons for purchasing D&O insurance in Taiwan are to reduce litigation risk, promote growth and retain the executives. The descriptive statistics reported in Table 3 support their findings. For instance, *GROWTH* (*AGE*) of firms with D&O insurance is significantly larger (smaller) than that of firms without D&O insurance. It implies that a firm who is with long history, with goods (or services) operated in a stable market, would consider its demand for D&O insurance to be lower.⁶ The means of the proportions of independent directors who are highly educated, well-connected, or financial experts for firms with D&O insurance are higher than those for firms without D&O insurance.⁷

⁶ We also find that electronic firms are significantly more likely to purchase D&O insurance than non-electronic firms do, possibly because they are more prone to high litigation risks. Besides, we examine whether the soundness of corporate governance relates to the presence of D&O insurance. Using the corporate governance composite score issued by Securities & Futures Institute as the proxy for the soundness of corporate governance, our analysis reveals that firms with better corporate governance quality are more likely to purchase D&O insurance.

⁷ The untabulated results show that: (i) VIF values in all regression models are below 3; (2) *DOLI* is positively correlated with *PCP*, *P_EDU*, *P_CON* and *P_EXP*, and (3) the largest correlation among control variables is that between *ROA* and *SDRET* (0.60).

Table 2 Descriptive Statistics

Variable	Mean	Q1	Median	Q3	Std.
<i>PCP</i>	0.824	0.667	1.000	1.000	0.274
<i>P_EDU</i>	0.710	0.500	0.750	1.000	0.331
<i>P_CON</i>	0.255	0.000	0.000	0.500	0.313
<i>P_EXP</i>	0.318	0.000	0.333	0.500	0.310
<i>DOLI</i>	0.720	0.000	1.000	1.000	0.449
<i>SIZE</i>	8.187	7.160	7.970	9.019	1.429
<i>ROA</i>	0.034	0.000	0.038	0.077	0.084
<i>LEV</i>	0.399	0.262	0.397	0.529	0.180
<i>GROWTH</i>	1.992	0.940	1.380	2.310	1.941
<i>PPE</i>	0.271	0.125	0.242	0.397	0.184
<i>AGE</i>	27.210	18.000	25.000	35.000	11.952
<i>RDR</i>	0.060	0.004	0.022	0.053	0.148
<i>FREECFO</i>	10.234	6.540	9.048	12.692	5.312
<i>SDRET</i>	0.068	0.010	0.071	0.130	0.102
<i>BSIZE</i>	2.234	2.079	2.303	2.303	0.186
<i>CEOTNR</i>	13.336	6.830	12.920	18.170	8.839
<i>DUALITY</i>	0.341	0.000	0.000	1.000	0.474

Notes: This table shows descriptive statistics of variables used for testing the relationship between D&O insurance and recruiting talented independent directors. All continuous variables are winsorized at the 1 percent and 99 percent levels. See the appendix for detailed variable definitions.

Table 3 Univariate Analysis

Variable	Firms with D&O insurance (<i>DOLI</i> = 1) (N=701)			Firms without D&O insurance (<i>DOLI</i> = 0) (N=272)			Difference in mean
	Mean	S.D.	Median	Mean	S.D.	Median	
<i>PCP</i>	0.856	0.236	1.000	0.744	0.340	1.000	0.012***
<i>P_EDU</i>	0.737	0.309	1.000	0.641	0.372	0.667	0.096***
<i>P_CON</i>	0.281	0.320	0.250	0.189	0.285	0.000	0.092***
<i>P_EXP</i>	0.332	0.307	0.333	0.283	0.314	0.333	0.049**
<i>SIZE</i>	8.325	1.471	8.128	7.832	1.250	7.645	0.493***
<i>ROA</i>	0.034	0.085	0.038	0.034	0.079	0.038	0.000
<i>LEV</i>	0.397	0.178	0.394	0.405	0.184	0.405	-0.008
<i>GROWTH</i>	2.067	2.044	1.400	1.800	1.633	1.345	0.267*
<i>PPE</i>	0.269	0.184	0.237	0.278	0.183	0.256	-0.009
<i>AGE</i>	25.603	11.562	23.000	31.349	11.965	29.000	-5.746***
<i>RDR</i>	0.066	0.147	0.027	0.047	0.152	0.010	0.019*
<i>FREECFO</i>	10.471	5.260	9.228	9.625	5.408	8.387	0.845**
<i>SDRET</i>	0.071	0.102	0.072	0.062	0.103	0.066	0.009
<i>BSIZE</i>	2.231	0.191	2.303	2.242	0.175	2.303	-0.011
<i>CEOTNR</i>	12.743	8.330	12.500	14.865	9.886	14.415	-2.122***
<i>DUALITY</i>	0.337	0.473	0.000	0.353	0.479	0.000	-0.016

Notes: This table shows the descriptive statistics, split by whether firms provide D&O insurance in the re-election year. The two-sample *t*-test is conducted to assess whether the mean of firms with D&O insurance is significantly different from that of firms without D&O insurance. ***, **, and * indicate significance at the 1, 5, and 10 percent levels, respectively (two-tailed). See the appendix for detailed variable definitions.

4.2 The Role of D&O Insurance in Recruiting Talented Independent Directors

4.2.1 Main regression results

Table 4 presents the results of Model (1). The coefficients and *t*-statistics are based on robust standard errors with firm clusters. Column (1) reveals that the coefficient of *DOLI* is 0.076 and is significant (*t*-statistic = 3.33) when explaining *PCP*, after controlling for numerous factors that may affect the proportion of talented independent directors. The result is supportive of our hypothesis, which proposes that D&O insurance helps firms to recruit independent directors who are highly educated, well-connected, or financial experts, that is, that D&O insurance is an effective recruiting tool to draw in talented individuals⁸.

Table 4 D&O Insurance and Recruiting Talented Independent Directors

Variables	<i>Dependent variable: PCP</i>	
	Coefficient	<i>t</i> -statistics
<i>DOLI</i>	0.076***	3.33
<i>SIZE</i>	0.018**	2.28
<i>ROA</i>	-0.180	-1.21
<i>LEV</i>	0.131**	2.19
<i>GROWTH</i>	0.001	0.17
<i>PPE</i>	-0.007	-0.13
<i>AGE</i>	0.000	0.50
<i>RDR</i>	0.039	0.63
<i>FREECFO</i>	0.275***	2.47
<i>SDRET</i>	-0.001	-0.55
<i>BSIZE</i>	-0.055	-1.13
<i>CEOTNR</i>	-0.002**	-1.73
<i>DUALITY</i>	0.017	0.92
Year fixed effects	Included	
Industry fixed effects	Included	
Adjusted <i>R</i> ²	0.064	
<i>N</i>	973	

Notes: This table reports the results of Model (1). The sample consists of 973 firm-years from 2013-2015. The dependent variable is *PCP*, defined as the number of talented independent directors divided by the total number of independent directors. The primary variable of interest is *DOLI*. *T*-statistics are based on standard errors clustered by firm. All tests are one-tailed. ***, **, and * indicate significance at the 1, 5, and 10 percent levels, respectively. For brevity, we omit the details regarding the estimated intercept, year and industry fixed effects. All other variables are as defined in the appendix.

⁸ As a sensitivity, we extend the sample period to 2018, and repeat the estimation of model (1). Using the new data, the untabulated results show that when *PCP* is the dependent variable, the coefficient of *DOLI* is 0.075 (*t*-value=4.19); when *P_EDU* is the dependent variable, the coefficient of *DOLI* is 0.064 (*t*-value=3.11); when *P_CON* is the dependent variable, the coefficient of *DOLI* is 0.068 (*t*-value=4.52); when *P_EXP* is the dependent variable, the coefficient of *DOLI* is 0.063 (*t*-value=3.36). In short, the estimation results for model (1) are unaffected by using an expanded sample.

4.2.2 Addressing the potential endogeneity issue in model (1)

It is argued that the purchase of D&O insurance might be a non-random decision, and hence, we follow Chung and Wynn (2008) to mitigate the potential endogenous selection bias by employing the Heckman two-stage approach. We use the proportion of firms with D&O insurance in the industry (*INDP_DOLI*) as an instrument because it is an exogenous variable economically correlated with a firm's propensity to purchase D&O insurance but is uncorrelated with the proportion of talented independent directors. Thus, in the first stage (i.e., Model (2), shown below), the purchase of D&O insurance is regressed on the instrument (*INDP_DOLI*), along with other determinants of purchasing D&O insurance. Then, we incorporate the inverse mills ratio (denoted as *IMR* in Table 5) from the first stage regression into Model (1) and repeat the analysis:

$$\begin{aligned}
 DOLI_{i,t} = & \beta_0 + \beta_1 INDP_DOLI_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 ROA_{i,t} + \beta_5 EX_{FIN_{i,t}} \\
 & + \beta_6 BOARD_COMP_{i,t} + \beta_7 INDP_{i,t} + \beta_8 DOWN_{i,t} + \beta_9 BLOCKOWN_{i,t} \\
 & + \beta_{10} INST_{i,t} + \beta_{11} BIGN_{i,t} + \beta_{12} BSIZE_{i,t} + Industry\ fixed\ effects \\
 & + Year\ fixed\ effects + \varepsilon_{i,t}.
 \end{aligned} \tag{2}$$

We follow prior studies (Core 1997; Chalmers, Dann, and Harford 2002; Chung and Wynn 2008) when including the determinants of purchasing D&O insurance. *EX_FIN* is the proceeds from the issuance of new shares in a specific year, deflated by average total assets, and it captures the degree of external financing. *BOARD_COMP* is the average pay (i.e., salary and bonuses) per director.⁹ *INDP* is the number of independent directors divided by the number of directors on the board. Director ownership (*DOWN*) is measured as the sum of the percentages of shares held by all directors. Blockholder ownership (*BLOCKOWN*) is the sum of the percentages of shares held by the top 10 shareholders. *INST* is the sum of the percentages of shares held by institutional investors. *BIGN* is equal to 1 if the firm is audited by a Big Four audit firm and is 0 otherwise. Other variables are defined in the same way as described in Model (1)¹⁰.

Table 5 presents the estimation results of Model (2). The number of observations is 971 (smaller than that reported in Table 4) because two observations are dropped due to missing values in some determinant variables. In column (1), the coefficient of *INDP_DOLI* is positive and significant at the 5% level, confirming that a firm's purchase of D&O insurance is related to D&O insurance prevalence in the industry. Column (1) also

⁹ For accuracy, we exclude employee profit sharing when a person is a dual director/employee. Therefore, only the directors' compensation is included.

¹⁰ We also include another two variables when estimating model (2), which are (i) whether the firm issues ADR (American depositary receipt), GDR (global depositary receipt), or ECB (Euro-convertible bond), and (ii) the percentage of foreign ownership. We obtain similar findings: *DOLI* is positively and significantly related to *PCP* (coefficient=0.079; *t*-value=3.31).

shows that firms with larger size, more independent directors, higher institutional ownership, or a Big 4 auditor are more likely to purchase D&O insurance, which is in line with the findings of prior literature (e.g., Core 1997; Chung and Wynn 2008). Column (2) reports the results concerning how *DOLI* affects *PCP* when an inverse mills ratio is included in the regression. The coefficient of *DOLI* remains positive and significant (t -statistic = 3.11), suggesting that D&O insurance still increases a firm's ability to attract talented independent directors even if we take into account the effect of a potential self-selection issue.

Table 5 D&O Insurance and Recruiting Talented Independent Directors: Endogeneity Issue

<i>Dependent variable</i>	First-stage		Second-stage	
	<i>DOLI</i>		<i>PCP</i>	
	Coefficient	z - statistics	Coefficient	t - statistics
<i>INDP_DOLI</i>	3.161**	1.71		
<i>DOLI</i>			0.074***	3.11
<i>SIZE</i>	0.098**	1.76	0.016**	1.76
<i>LEV</i>	-0.059	-0.20	0.129**	2.15
<i>ROA</i>	-0.999*	-1.41	-0.171	-1.13
<i>EX_FIN</i>	0.268	0.38		
<i>BOARD_COMP</i>	-0.040	-1.05		
<i>INDP</i>	3.350***	4.38		
<i>DOWN</i>	-0.009**	-2.00		
<i>BLOCKOWN</i>	-0.026***	-4.93		
<i>INST</i>	0.011***	3.37		
<i>BIGN</i>	0.381***	2.75		
<i>BFSIZE</i>	0.247	0.74	-0.049	-0.98
<i>GROWTH</i>			0.001	0.24
<i>PPE</i>			-0.005	-0.10
<i>AGE</i>			0.001	0.64
<i>RDR</i>			0.039	0.62
<i>FREECFO</i>			0.275***	2.47
<i>SDRET</i>			-0.001	-0.52
<i>CEOTNR</i>			-0.002**	-1.77
<i>DUALITY</i>			0.018	0.96
<i>IMR</i>			-0.021	-0.43
Year fixed effects	Included		Included	
Industry fixed effects	Included		Included	
Pseudo R^2 /Adjusted R^2	0.171		0.065	
N	971		971	

Notes: This table reports the results regarding D&O insurance and recruiting talented independent directors after controlling for self-selection bias by applying Heckman two-stage approach. *INDP_DOLI* is an instrument, defined as the proportion of firms with D&O insurance in the industry. *IMR* is inverse mills ratio derived from the first-stage regression. The primary variable of interest is *DOLI*. Z -statistics (t -statistics) in the first-stage (second-stage) model are based on standard errors clustered by firm. All tests are one-tailed. ***, **, and * indicate significance at the 1, 5, and 10 percent levels, respectively. For brevity, we omit the details regarding the estimated intercept, year and industry fixed effects. All variables are as defined in the appendix.

4.2.3 First-time recruitment analysis

The effect of D&O insurance may be pertinent only when a candidate director decides whether to join a board for the first time. To address this possibility, we alternatively focus on independent directors who are recruited by the firm for the first time. We define *PCP_NEW* as the proportion of talented independent directors within the whole group of newly recruited independent directors. Hence, a greater *PCP_NEW* indicates that, among the newly recruited independent directors, more of them are highly educated, well-connected, or financial experts. We focus on only firms with at least one independent director joining the board of directors for the first time, which results in 632 observations. We employ *DOLI*, along with all other variables shown in Model (1), to explain *PCP_NEW*. The results are presented in Table 6. The coefficient of *DOLI* is 0.076 (t -statistic = 2.39), consistent with D&O insurance increasing the proportion of talented independent directors among the newly recruited members. The results again support our hypothesis that providing D&O insurance helps firms recruit talented independent directors.¹¹

Table 6 D&O Insurance and Recruiting Talented Independent Directors: First Time Recruitment

Variables	Dependent variable: <i>PCP_NEW</i>	
	Coefficient	t - statistics
<i>DOLI</i>	0.076***	2.39
<i>SIZE</i>	0.016*	1.34
<i>ROA</i>	0.016	0.07
<i>LEV</i>	0.157**	1.69
<i>GROWTH</i>	0.002	0.39
<i>PPE</i>	-0.079	-0.98
<i>AGE</i>	0.001	0.97
<i>RDR</i>	0.081	1.05
<i>FREECFO</i>	0.122	0.79
<i>SDRET</i>	0.002	0.84
<i>BSIZE</i>	-0.067	-0.93
<i>CEOTNR</i>	-0.002	-1.05
<i>DUALITY</i>	-0.023	-0.81
Year fixed effects	Included	
Industry fixed effects	Included	
Adjusted R^2	0.033	
N	632	

Notes: This table reports the results regarding D&O insurance and recruiting talented independent directors based on only firms with newly recruited independent directors. The samples consist of 632 firm-years from 2013-2015. *PCP_NEW* is the number of newly recruited talented independent directors divided by the total number of newly recruited independent directors. T -statistics are based on standard errors clustered by firm. All tests are one-tailed. ***, **, and * indicate significance at the 1, 5, and 10 percent levels, respectively. For brevity, we omit the details regarding the estimated intercept, year and industry fixed effects. All variables are as defined in the appendix.

¹¹ Similar to Section 4.2.2, we employ the Heckman two-stage approach to control for possible endogeneity involved in the purchase of D&O insurance when conducting the first-time recruitment analysis. The untabulated result shows that *DOLI* is still positively related to *PCP* (coefficient = 0.073, t -statistic = 2.13).

4.2.4 Separating the three types of talented independent directors

In Model (1), the dependent variable (*PCP*) is the number of talented independent directors (i.e., who are highly educated, well-connected, or financial experts) divided by the total number of independent directors. We further examine separately whether D&O insurance is influential in recruiting the three types of talented independent directors. Specifically, *P_EDU* is the number of highly educated independent directors (i.e., who have a master's degree or higher) divided by the total number of independent directors. *P_CON* is the number of well-connected independent directors (i.e., who serve on three or more boards) divided by the total number of independent directors. *P_EXP* is the number of independent directors who are financial experts divided by the total number of independent directors. The results in Table 7 indicate that the coefficients of *DOLI* are positive and significant in explaining *P_EDU*, *P_CON*, and *P_EXP* (*t*-values = 2.38, 2.42, and 2.36, respectively)¹². Therefore, D&O insurance is relevant when recruiting all three types of talented independent directors, also suggesting that our results in Table 4 are not driven by any individual type of talented independent director.¹³

¹² We also examine whether independent directors who meet two or three talent characteristics at the same time are more or less concerned about D&O insurance when deciding whether to join a board. Untabulated results show that the presence of D&O insurance significantly and positively relates to the percentage of directors who are both highly-educated and well-connected (or the percentage of independent directors who are highly-educated, well-connected, and financial experts), while the association between D&O insurance and the percentage of independent directors who are well-connected and financial experts (or the percentage of directors who are both highly-educated and financial experts) is not significant. The result provides some evidence that D&O insurance is influential in recruiting independent directors who meet multiple talent characteristics.

¹³ Similar to Section 4.2.2, we also employ the Heckman two-stage approach to control for possible endogeneity when examining the effect of D&O insurance on recruiting the three types of talented independent directors. The untabulated result shows that *DOLI* is still positively related to *D_EDU* (coefficient = 0.058, *t*-statistic = 2.09), *D_CON* (coefficient = 0.045, *t*-statistic = 1.86), and *D_EXP* (coefficient = 0.047, *t*-statistic = 1.84).

Table 7 D&O Insurance and Recruiting Three Types of Talented Independent Directors

Variables	Dependent variable					
	<i>P_EDU</i>		<i>P_CON</i>		<i>P_EXP</i>	
	Coefficient	<i>t</i> -statistics	Coefficient	<i>t</i> -statistics	Coefficient	<i>t</i> -statistics
<i>DOLI</i>	0.062***	2.38	0.056***	2.42	0.056***	2.36
<i>SIZE</i>	0.025***	2.59	0.065***	6.92	-0.008	-0.86
<i>ROA</i>	-0.350**	-1.84	-0.567***	-3.16	-0.060	-0.33
<i>LEV</i>	0.078	1.12	-0.083	-1.21	0.025	0.34
<i>GROWTH</i>	0.005	0.71	-0.003	-0.52	0.010*	1.50
<i>PPE</i>	0.074	1.13	-0.043	-0.66	0.041	0.63
<i>AGE</i>	0.001	0.90	-0.001	-0.75	-0.001	-0.94
<i>RDR</i>	0.070	1.03	-0.041	-0.63	-0.121*	-1.31
<i>FREECFO</i>	0.329***	2.41	0.179*	1.42	0.102	0.76
<i>SDRET</i>	-0.003	-1.13	-0.002	-1.17	0.000	0.01
<i>BSIZE</i>	-0.007	-0.11	-0.059	-1.03	-0.116**	-2.09
<i>CEOTNR</i>	-0.002*	-1.44	-0.001	-0.45	0.002*	1.47
<i>DUALITY</i>	0.007	0.28	-0.032*	-1.49	0.004	0.19
Year fixed effects	Included		Included		Included	
Industry fixed effects	Included		Included		Included	
Adjusted <i>R</i> ²	0.044		0.087		0.014	
<i>N</i>	973		973		973	

Notes: This table reports the results regarding D&O insurance and three types of talented independent directors. The sample consists of 973 director-firm-years from 2013-2015. The dependent variables are *P_EDU*, *P_CON* or *P_EXP*, respectively. *P_EDU* is the number of independent directors with a master's degree or higher divided by the total number of independent directors. *P_CON* is the number of independent directors who hold three or more directorships divided by the total number of independent directors. *P_EXP* is equal to the number of independent directors who are financial experts divided by the total number of independent directors. The primary variable of interest is *DOLI*. *T*-statistics are based on standard errors clustered by firm. All tests are one-tailed. ***, **, and * indicate significance at the 1, 5, and 10 percent levels, respectively. For brevity, we omit the details regarding the estimated intercept, year and industry fixed effects. All other variables are as defined in the appendix.

4.2.5 Alternative measure of talented independent directors

To ensure the stability of our findings, we modify our definition of “talented director” when estimating Model (1). First, when defining a “well-connected independent director,” we use the criterion of holding six directorships as an alternative cutoff point (Fich and Shivdasani 2006). Untabulated results show that the coefficient of *DOLI* is 0.085 (*t*-statistic = 3.63) and, hence, our inferences are not affected by this adjustment.

Second, the original definition of “financial expert” included having a finance and accounting background, while some studies argue that an accounting background is preferred by investors from the monitoring perspective (Defond, Hann, and Hu 2005; Krishnan and Visvanathan 2008). Hence, we separate expertise in finance (*P_FIN*) from expertise in accounting (*P_ACC*) and repeat the analysis. The untabulated results indicate that the coefficients of *DOLI* for *P_FIN* and *P_ACC* are 0.026 and 0.045, respectively, and both are significant. Thus, the main results are robust to this adjustment.

4.2.6 The use of propensity score matching

We also follow Yuan et al. (2016) to employ the propensity score matching method in addressing the endogeneity issue. Control group observations ($DOLI=0$) are chosen without replacement based on the closeness to treatment group observations ($DOLI=1$) along the values of a vector of characteristics including $INDP_DOLI$, $SIZE$, LEV , ROA , EX_FIN , $BOARD_COMP$, $INDP$, $DOWN$, $BLOCKOWN$, $INST$, $BIGN$, and $BFSIZE$, same with ones in first-stage Heckman selection model. Before conducting the regression analysis, the results of balancing test show that none of the mean differences between the treatment group and the control group is statistically significant after matching. Then, we repeat estimating model (1) based on observations derived from applying the propensity score matching, and find that the coefficient of PCP is 0.086 (t -value=2.96). Therefore, our main findings are robust to this adjustment.

4.3 Additional Test: D&O Insurance as a Retaining Tool

AIG (2012) reports that 55% of firms in the Financial Times and Stock Exchange 100 index consider D&O insurance vital to retaining directors. A survey by the Corporate Governance and Financial Reporting Centre at the National University of Singapore¹⁴ on listed firms in Singapore reports that 60% of respondents agree that having D&O insurance helps retain experienced directors. Therefore, we additionally examine whether the purchase of D&O insurance is associated with a lower possibility that independent directors resign within their term. We focus on resignation because the firm's dismissal decisions are not expected to be affected by D&O insurance. Besides, as long as a firm provides D&O insurance, the protection applies to all independent directors, and hence, in the resignation test, we consider the resignation incidence of all independent directors rather than only that of talented ones.

As such, after excluding observations due to insufficient board and firm characteristic data, the sample consists of 2,652 observations: 104 with at least one independent director tendering a resignation during the given year, and 2,548 without the incidence of any independent directors' resignations. We estimate the following regression to examine the effect of D&O insurance on the incidence of resignations. We define the incidence of resignation in the form of dummy and continuous variables to ensure the robustness of the estimated results.

$$\begin{aligned}
 & RESIGN_{i,t} \text{ or } P_{RESIGN_{i,t}} \\
 & = \alpha_0 + \alpha_1 DOLI_{i,t} + \alpha_2 BOARD_COMP_{i,t} + \alpha_3 BFSIZE_{i,t} + \alpha_4 INDP_{i,t} + \alpha_5 DOWN_{i,t} \\
 & \quad + \alpha_6 BLOCKOWN_{i,t} + \alpha_7 DUALITY_{i,t} + \alpha_8 CEO_LEAVE_{i,t} + \alpha_9 SIZE_{i,t} + \alpha_{10} ROA_{i,t} \\
 & \quad + \alpha_{11} LEV_{i,t} + \alpha_{12} RET_{i,t} + \alpha_{13} SDRET_{i,t} + \alpha_{14} LYEAR_{i,t} + \text{Industry fixed effects}
 \end{aligned}$$

¹⁴ See <http://bschool.nus.edu.sg/Portals/0/images/CGFRC/docs/JLT-final%20presentation.pdf>.

$$+ \text{Year fixed effects} + \varepsilon_{i,t}. \quad (3)$$

RESIGN is equal to 1 if the firm has any independent directors resigning from the board within the term in the given year, and 0 otherwise. *P_RESIGN* is the number of independent directors who resign from the board within the term divided by the total number of independent directors on the board in a given year. If independent directors are less likely to resign when firms offer D&O insurance, α_1 would be negative. We include several variables to control for differences in board or firm characteristics that are likely to correlate with the resignation of directors (Yermack 2004; Dewally and Peck 2010; Fahlenbrach, Low, and Stulz 2017). *CEO_LEAVE* is equal to 1 when there is CEO turnover and is 0 otherwise. *RET* is the annual market-adjusted return. *LYEAR* is the number of years that a firm has been traded on the TSE or TPEX. The remaining variables are as defined in models (1) and (2).

Table 8 shows the results of the association between D&O insurance and independent directors' resignation¹⁵. When *RESIGN* is the dependent variable, we apply the logistic estimation method, and the coefficient of *DOLI* is -0.828 and significant (z -statistic = -2.82). When *P_RESIGN* is the dependent variable, we employ the ordinary least squares (OLS) approach, and the coefficient of *DOLI* is -0.020 and significant (t -statistic = -2.01). The results support that D&O insurance reduces the likelihood of an independent director's resignation from the board.

¹⁵ Similar to Section 4.2.2, we control for possible endogeneity involved in the purchase of D&O insurance when estimating Model (3). The untabulated results show that *DOLI* is still negatively related to *RESIGN* (coefficient = -0.841 , z -statistic = -2.78), while it is also negatively related to *P_RESIGN* (coefficient = -0.020 , t -statistic = -1.88). In short, the finding that D&O insurance reduces the probability of independent directors resigning from the board remains unaffected.

Table 8 D&O Insurance and The Resignation of Independent Directors

Variables	<i>Dependent variable</i>			
	<i>RESIGN</i>		<i>P_RESIGN</i>	
	Coefficient	<i>z</i> - statistics	Coefficient	<i>t</i> - statistics
<i>DOLI</i>	-0.828***	-2.82	-0.020**	-2.01
<i>BOARD_COMP</i>	-0.542**	-2.20	-0.001	-0.69
<i>BSIZE</i>	1.174*	1.38	0.055**	2.00
<i>INDP</i>	10.820***	7.23	0.477***	6.04
<i>DOWN</i>	-0.005	-0.53	-0.000	-0.49
<i>BLOCKHOLDER</i>	0.011	1.08	0.000	1.17
<i>DUALITY</i>	-0.134	-0.55	-0.003	-0.43
<i>CEO_LEAVE</i>	0.053	0.13	0.012	0.54
<i>SIZE</i>	-0.190*	-1.54	-0.007**	-2.15
<i>ROA</i>	-3.394**	-2.06	-0.172***	-2.72
<i>LEV</i>	0.591	0.85	0.022	0.91
<i>RET</i>	0.007***	2.76	0.000***	2.86
<i>SDRET</i>	-0.011	-0.45	-0.001	-0.61
<i>LYEAR</i>	-0.027	-1.08	-0.000	-0.41
Year fixed effects	Included		Included	
Industry fixed effects	Included		Included	
Pseudo R^2 /Adjusted R^2	0.209		0.062	
N	2,652		2,652	

Notes: This table reports the results of the association between D&O insurance and independent director's resignation. The sample consists of 2,652 firm-years from 2013-2015. *RESIGN* is equal to 1 if the firm has any independent director resigning from the board within the term in the given year, and 0 otherwise. *P_RESIGN* is the number of independent directors who resign from the board divided by the total number of independent directors on the board. The primary variable of interest is *DOLI*. *Z*-statistics (or *t*-statistics) are based on standard errors clustered by firm. All tests are one-tailed. ***, **, and * indicate significance at the 1, 5, and 10 percent levels, respectively. For brevity, we omit the details regarding the estimated intercept, year and industry fixed effects. All variables are as defined in the appendix.

4.4 Discussion of Theoretical, Practical, and Policy Implications

The above empirical results confirm the effectiveness of D&O insurance in recruiting and retaining independent directors. As independent directors have been considered key to enhancing investor confidence, reducing agency costs, and, thus, improving the efficiency of the organizational structure among corporate governance tools (Fama and Jensen 1983; Shleifer and Vishny 1997), our findings provide theoretical, practical, and policy implications. First, we offer direct empirical evidence in the argument that D&O insurance helps firms recruit and retain talented directors, which has been long contended and assumed to be true by prior literature (Priest 1987; Daniels and Hutton 1993; Boyer and Stern 2012; Lin et al. 2013) but has rarely been formally tested. Also, our evidence complements the general board literature by demonstrating that D&O insurance may serve as a major determinant of board composition.

Second, our findings support practitioners' contention that D&O insurance is used in attracting and retaining great talent. In particular, while increasingly stringent scrutiny

from corporate governance requirements stipulated by regulators has contributed to an unambiguous increase in the demand for independent directors, independent directors have not added to their number of board seats but have rather reduced this number. Incumbents are more likely to depart from firms that are costly to advise and monitor (Chen and Moers 2018). In addition, due to the changing and growing complexity of the business environment, it is argued that independent directors without sufficient social capital or abundant knowledge may not perform the monitoring role effectively (Luan and Tang 2007; Kor and Sundaramurthy 2009; Guldiken and Darendeli 2016). Taken together, it is foreseeable that attracting and retaining talented independent directors will become increasingly crucial to firm success but will practically turn out to be challenging. Hence, our evidence highlights that firms should take full advantage of D&O insurance to hold onto great talent on the board.

Finally, our evidence informs regulators of the importance of D&O insurance in encouraging talented independent directors to serve on boards, and it concurs with some regulatory initiatives that require publicly traded firms to purchase D&O insurance. In other words, in order to facilitate the proper functioning of independent directors' duties, which would directly impact corporate outcomes, encouraging the purchase of D&O insurance is at least one of the prerequisites for ensuring that there is a sufficient supply of independent directors in the capital market.

5. CONCLUSION REMARKS, LIMITATIONS, AND FUTURE RESEARCH

Using a D&O insurance dataset based on publicly traded firms in Taiwan, we explored the role of D&O insurance in firms' quest for talented independent directors. First, we found that, compared with firms without D&O insurance, firms with D&O insurance were more likely to recruit highly talented independent directors, defined as being highly-educated, well-connected, or financial experts. Second, D&O insurance is negatively associated with the incidence of independence directors' resignation from the board. The results of robustness checks reveal that our inferences remain qualitatively similar after accounting for the potential endogeneity and the alternative definitions of "talented directors."

Our study is innovative in that, unlike some existing academic literature that focuses on the negative effect of D&O insurance, we propose that, from practitioners' viewpoints, D&O insurance is imperative, and find supportive evidence. One caveat is that the study does not intend to refute the findings in previous studies that document some adverse consequences of D&O insurance. More specifically, while previous studies examine "whether D&O insurance induces directors' value decreasing incentive," we instead focus

on whether the original intended benefits of introducing D&O insurance—that is, recruiting and retaining capable directors—are achieved. Even though the question of how D&O insurance affects firm performance is an important issue, it is empirically challenging to ensure that the firm performance–D&O insurance relationship is not subject to empirical difficulties, such as econometric issues or the choice on appropriate performance measures. On the other hand, few would disagree that capable directors are essential to firm success. We interpret our findings as indicating that D&O insurance at least fulfills the intended benefits when it is originally introduced (i.e., recruiting and retaining independent directors), and hence, it appears to be indispensable as long as independent directors remain the cornerstone of sound corporate governance.

This study is subject to the following research limitations. First, it is possible that independent directors are affected by reputation and compensation factors. However, it is difficult to quantify reputation factor and the compensation data on individual independent directors is not available in Taiwan. Hence, it is not feasible to include reputation and compensation factors in our empirical models. We analyze whether such a limitation would affect our empirical results. It is possible that “the purchase of D&O insurance” is (i) positively, (ii) negatively, or (iii) not related to “independent directors’ compensation.” The news-press reported that roughly 70 percent of firms paid relatively low annual compensation to independent directors, while our empirical data reveals that about 72 percent of firms purchase D&O insurance; accordingly, it is highly unlikely that “the purchase of D&O insurance” significantly positively relates to “independent directors’ compensation.” Then, if (ii) is true, we should document a significant “negative” association between D&O insurance and firms’ ability to recruit and retain high quality independent directors, while nevertheless it is not such a case according to our empirical evidence. In sum, (iii) is the most likely situation. Then, it follows that the failure to include the independent directors’ compensation may not essentially impact our empirical findings.

The second research limitation is that our sample period does not cover 2017 when the financial fraud of XPEC Entertainment broke out and raised serious public concern over independent directors, which eventually makes independent directors beware of the rising litigation risk. Though, we note that if independent directors consider litigation risk to be trivial during our sample period (2013-2015), it is less likely to find a significant association between D&O insurance and recruiting (or retaining) talented independent directors; however, empirically we document such a significant association. Hence, it is reasonable to expect that D&O insurance still serves as a relevant tool in recruiting and retaining talented independent directors in post-2017 periods when the threat of litigation risk is clearly stronger, and future research may take on the empirical investigation.

APPENDIX

	Variable	Description
D&O insurance	<i>DOLI</i>	= 1 if the firm has D&O insurance in the current year and 0 otherwise.
Talented independent director	<i>PCP</i>	= the number of talented independent directors divided by the total number of independent directors, while an independent director is talented if he or she has a master's degree or higher, holds three or more directorships, or has financial expertise.
	<i>P_EDU</i>	= the number of independent directors who have a master's degree or higher divided by the total number of independent directors.
	<i>P_CON</i>	= the number of independent directors who hold three or more directorships divided by the total number of independent directors.
	<i>P_EXP</i>	= the number of independent directors who possess finance/accounting expertise divided by the total number of independent directors.
Independent director resignation	<i>RESIGN</i>	= 1 if the firm has any independent directors resigning from the board within the term in the given year, and 0 otherwise.
	<i>P_RESIGN</i>	= the number of independent directors who resign from the board within the term divided by the total number of independent directors on the board.
Corporate governance variables	<i>BOARD_COMP</i>	= the average pay (salary and bonus) per director.
	<i>DUALITY</i>	= 1 if the chief executive officer (CEO) is also the chairperson of the board of directors and 0 otherwise.
	<i>BFSIZE</i>	= the natural logarithm of the number of directors on the board.
	<i>DOWN</i>	= the sum of the percentages of shares held by all directors.
	<i>BLOCKOWN</i>	= the sum of the percentages of shares held by blockholders.
	<i>INST</i>	= the sum of the percentages of shares held by institutional investors.
	<i>INDP</i>	= the number of independent directors divided by the number of directors on the board.
	<i>CEOTNR</i>	= the number of years the CEO has been in the role.
	<i>CEO_LEAVE</i>	= 1 if there has been CEO turnover and 0 otherwise.
Firm characteristics	<i>SIZE</i>	= the natural logarithm of market value of equity.
	<i>ROA</i>	= the income from continuing operations divided by the average total assets.
	<i>LEV</i>	= the total liabilities divided by total assets.

Variable	Description
<i>GROWTH</i>	= the ratio of market value of common equity to book value of common equity.
<i>PPE</i>	= the ratio of property, plant, and equipment to total assets.
<i>AGE</i>	= the number of years since the firm's foundation.
<i>RDR</i>	= the ratio of a firm's research and development (R&D) expenditures to net sales.
<i>FREECFO</i>	= the operating income before depreciation minus total income taxes, change in deferred taxes, interest expense, preferred dividends, and dividends on common stock divided by total assets.
<i>SDRET</i>	= the standard deviation of monthly stock returns in a year.
<i>RET</i>	= the one-year market-adjusted return.
<i>LYEAR</i>	= the number of years that a firm has been traded in the Taiwan Stock Exchange (TSE) or Taipei Exchange (TPEX).
<i>EX_FIN</i>	= the proceeds from the issuance of new shares in a specific year, deflated by the average total assets.
<i>BIGN</i>	= 1 if the firm is audited by a Big 4 audit firm and 0 otherwise.

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