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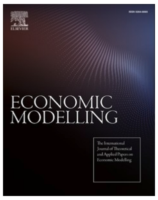

# Do directors with foreign experience increase the corporate demand for directors' and officers' liability insurance? Evidence from China[☆]

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## ABSTRACT

Do directors with foreign experience increase the corporate demand for directors' and officers' liability (D&O) insurance? Previous studies have documented the impacts of firms having D&O insurance on corporate practices. However, it is unclear how a firm's decision to acquire D&O insurance is made in an emerging market. Using a sample of Chinese firms from 2008 to 2018, we examine the impact of having overseas returnee directors (ORDs) on a firm's demand for D&O insurance. Our findings suggest that firms with ORDs are likely to have such insurance. Further analyses suggest that the association is more pronounced for firms with a high level of internationalization or located in high marketization regions (i.e., locations with a well-functioning market system). Hence, a firm's internationalization and its location's marketization are the mechanisms for the impact. Our results advance the literature on the effect of personnel internationalization on the demand for D&O insurance.

## 1. Introduction

In financial development, legal systems in emerging markets have gradually improved, and directors and officers have become subject to increased litigation risk resulting from vulnerable corporate decisions. Hence, potential legal liability may interfere with directors and senior executives making optimal decisions for their firms. In essence, directors' and officers' liability insurance (D&O insurance) can mitigate the personal legal liability of directors and senior executives. In mature capital markets, D&O insurance has become a standard risk-management tool. Currently, the D&O insurance literature focuses mainly on the impact of D&O insurance on corporate governance (Chang et al., 2018), risk-taking and financial reporting (Lin et al., 2019), innovation (Wang et al., 2020), and IPO pricing (Kao et al., 2020). However, firms in emerging markets rarely purchase D&O insurance (Yuan et al., 2016; Jia et al., 2019). It is unclear how firms in an emerging market decide to purchase D&O insurance. While a few studies examine the determinants of providing D&O insurance from legal and corporate governance perspectives (Zou et al., 2008; Gillan and Panasian, 2015; Chang et al., 2018), little is known about the impact of directors' characteristics on the demand for D&O insurance.

A related body of literature postulates that directors with previous overseas experience (overseas returnee directors, ORDs) can help firms learn from the best corporate governance practices overseas (Iliev and Roth, 2018) and facilitate internationalization (Oxelheim et al., 2013). In addition, some studies show that auditors with overseas experience provide high-quality audits (Hou et al., 2020) and chief executive officers (CEOs) with such experience are likely to conduct foreign initial public offerings (IPOs) (Duan et al., 2020). We hypothesize that, due to their overseas experience, ORDs notice the benefits of D&O insurance and thus increase corporate demand for D&O insurance. We aim to examine the hypothesis using a sample of Chinese firms. Our findings would expand our understanding on the internal driver of D&O insurance in an emerging market.

We conduct our analysis using a sample of Chinese firms. China has a good background for our research for several reasons. First, China is an emerging market, progressing in its financial development. It has disproportionately fewer firms (7.2% in our sample) with D&O

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insurance than mature markets. Second, directors face high litigation risk when making corporate decisions because of China's financial development and marketization (i.e., a functioning market economy).[1] Third, ORDs become popular after firms achieve internationalization. Therefore, the Chinese market environment provides good data for our analysis. Our findings offer lessons to other emerging markets.

Using a sample of Chinese firms (2008–2018), we document evidence consistent with our core testable hypothesis that when a firm has at least one ORD or a high proportion of ORDs on its board, it is likely to provide D&O insurance. The result is economically significant. For example, when a firm has at least one ORD, it is approximately 29% more likely to provide D&O insurance than a firm without any ORD. In addition, the results are robust to the instrumental variable method, propensity score matching procedure, other robust analyses with alternative variables or samples, and after accounting for the personal characteristics of CEOs and chairpersons. Further analysis suggests that the association is more pronounced for firms with high internationalization and those in high marketization provinces.

Moreover, we report that the impact of ORDs' foreign experience on D&O insurance provision is not homogeneous. Further analyses suggest that if an ORD's experience is from a country of low-interpersonal power distance, high individualism society, or increased uncertainty avoidance culture (Hofstede, 1980, 2001), the impact of the ORDs on the provision of D&O insurance is more salient than vice versa. Hence, our findings corroborate the core hypothesis prediction. When an ORD is exposed to a culture that values individual opinion (low-interpersonal power distance and high individualism) or avoids uncertainty, they increase demand for D&O insurance.

Our study contributes to the literature in three important ways. First, while there are studies on the impact of ORDs on corporate decisions, the focus is not on D&O insurance. To our best knowledge, we provide a first study on the impact of ORDs on the corporate demand for D&O insurance. Our findings echo the literature on ORDs related to the positive spillover effects of having ORDs to bring the best non-insurance practices to a firm (Bloom and Van Reenen, 2007; Iliev and Roth, 2018). Second, the insurance literature suggests that the demand for insurance depends on risk exposure, perception, and tolerance (Beenstock et al., 1998; Botzen and van den Bergh, 2012; Cong et al., 2020). Instead, we find that the demand for D&O insurance has determinants of internationalization (internal) and marketization (external) that extend beyond the conventional determinants in the literature. These internal and external business environments contribute to a firm's demand for D&O insurance. Third, our findings complement the broad literature on the importance of national culture in corporate policies and practices (Hofstede, 1980, 2001). Many studies suggest that national culture is a crucial influence on a firm's policies and practices, such as dividend policy (Bae et al., 2012; Shao et al., 2010), corporate governance practice (Daniel et al., 2012), earnings management (Yung and Root, 2019), and corporate risk-taking (Tran, 2019). However, how different elements of national culture such as interpersonal power distance, high individualism society, or increased uncertainty avoidance impact a firm's policy is still unclear. Our findings fill the gap by extending the theory of Hofstede (1980, 2001) to the demand for D&O insurance and show the relevance of these elements of national culture in the decision to provide D&O insurance.

Section 2 presents the literature review and hypothesis development. Section 3 discusses the research design including data, variable definitions, and summary statistics of the sample. Section 4 shows the results and provides related discussions. Section 5 concludes the study.

## 2. Literature review and hypothesis development

### 2.1. The background of directors' and officers' (D&O) insurance in China

With the development of China's capital markets, Chinese regulators have attempted to enhance the corporate governance level of publicly listed firms. In 2002, the China Securities Regulatory Commission announced the "Guidelines on Listed Companies Corporate Governance." One of the guidelines specifies that firms can purchase D&O insurance for their directors and senior executives upon the board's approval. This ability to use D&O insurance to enhance corporate governance is a firm's milestone.

In recent years, several scandals, such as fraudulent sales reported in Luckin Coffee Inc. in 2020 and false financial statements in Kangmei Pharmaceutical Co. Ltd. in 2019, caused colossal litigation risk to directors and officers. Thus, D&O insurance drew much attention, and firms purchased it. However, similar to other emerging markets, the popularity of D&O insurance among Chinese firms has not gained momentum. According to our summary statistics, only 7.2% of the firm-years in our sample show firms having D&O insurance.

While D&O insurance is aimed at officers and directors, the board is charged with the approval of the insurance. In China, to buy D&O insurance, a firm needs approval from its board of directors during the annual shareholders' meeting. Hence, our study focuses on ORDs.

### 2.2. Literature review

There are two strands of literature related to our study. We discuss them in the sections below.

#### 2.2.1. D&O insurance

The literature on D&O insurance has two clusters. The first cluster discusses the effect of D&O insurance on firm behavior. Chang et al. (2018) propose a model to examine firms' decisions about D&O insurance provision. The authors consider the trade-off of the insurance of governance effect (positive to a firm) versus the moral hazard effect (negative to a firm). Jia and Tang (2018) document that D&O-insured independent directors behave less responsibly than those not insured, suggesting that the insurance has a moral hazard effect on independent director behavior. Lin et al. (2020) report that a firm's audit risk increases with D&O insurance, suggesting that insurance protection encourages executives to raise their operating risk.

Lin et al. (2019) study a new law in Germany that imposed a deductible on D&O insurance and find that stock prices reacted positively in the short run. Interestingly, firms lower their risk-taking in operating activities and financial reporting and improve the quality of their takeover decisions in the long run. Thus, D&O insurance provides short- and long-term benefits to firms.

Kao et al. (2020) documented that an IPO with D&O insurance has lower IPO underpricing. The authors conjecture that the insurance shields IPO firm executives and directors from litigation, encouraging them to take risks in business decisions. Therefore, the prospect of the IPO firm becomes more positive, and investors will accept a higher offer price (which means lower underpricing).

Wang et al. (2020) document that a firm's D&O insurance positively correlates with its innovation. The authors attribute the positive impact of the insurance to executives being encouraged to engage in innovative activities with less concern for personal liability. Hence, D&O insurance raises executives' tolerance for innovation failures.

In conclusion, this literature cluster suggests that D&O insurance is a double-edged sword. Insurance has a positive governance effect on firms, enabling executives and directors to make the best decisions on behalf of shareholders. However, it also has an unintended consequence of increasing a firm's moral hazard.

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[1] Marketization is a process in which firms engage in market-oriented operation (van der Hoeven and Sziráczki, 1997, p. 63). It is achieved via less government involvement in the economy and an enforceable legal environment for all the firms to facilitate firms using market mechanisms in economic transactions and contracting. That is, the economy has a well-functioning market system for all the firms to conduct their activities (Vickerstaff, 1998, p. 101).

The second cluster examines the contributing factors to the demand for D&O insurance. Zou et al. (2008) show that the controlling-minority shareholder conflict positively correlates with the demand for insurance. Jia et al. (2019) document that some Chinese firms have a low demand for D&O insurance; this is so because they are politically connected, which mitigates the executives' and directors' litigation risks. Similarly, Lai and Tai (2019) report that the demand for D&O insurance is high for family firms with overconfident CEOs. These studies focus on the firms' governance characteristics to explain the demand for insurance. However, we do not know the directors' foreign experience role in the demand for D&O insurance.

### *2.2.2. The value of foreign experience from internal stakeholders*

From the perspective of Hofstede (1980, 2001), national culture has four dimensions: individualism-collectivism, uncertainty avoidance, power distance, and masculinity-femininity. When internal stakeholders, such as executives and directors, have foreign experience, they communicate better in cross-cultural settings. Most importantly, these internal stakeholders carry the best practices from overseas and utilize them professionally in their firms. We consider this as personnel internationalization. The effect is positive for a firm and echoes the literature on the positive effects of internationalization (De Loecker, 2007; Greenaway et al., 2008; Park et al., 2010).

Several studies find supporting evidence for the benefits of personnel internationalization. When executives have foreign experience, their firms innovate better than those without such experience (Yuan and Wen, 2018). Similarly, Zhang et al. (2018) document that firms with ORDs engage in more corporate social responsibility than those without ORDs. In addition, when CEOs have foreign experience, they garner better compensation as it is believed that such experiences enhance a firm's value (Conyon et al., 2019). However, whether ORDs are related to the demand for D&O insurance is unclear.

## *2.3. Hypothesis development*

Based on the literature review, we have three arguments to support our first hypothesis: ORDs increase demand for D&O insurance. First, after a certain period of residence abroad, ORDs become less familiar with Chinese corporate culture and how Chinese firms operate and manage. Therefore, their business philosophies and operating styles may not be easily understood and accepted by individuals without foreign experience. The potential conflict within their firms potentially results in corporate policies and practices not aligning with ORDs. Generally, ORDs prefer having D&O insurance protection to minimize their risk exposure. Therefore, the demand for D&O insurance increases.

Second, ORDs learn the best managerial practices overseas and share their knowledge with their respective boards (Bloom and Van Reenen, 2007; Iliev and Roth, 2018). Notably, ORDs widely accept using D&O insurance to transfer risk exposure to enhance managerial effectiveness. The findings from this body of literature reveal the cultural differences between ORDs and local directors, and the former in firms being likely to provide such insurance.

Third, Chinese Confucian culture shapes individuals to accept uncertainty (Frijns et al., 2013; Hofstede, 2001). As a result, local directors are likely to accept their potential risk exposure "as is" and are unlikely to have D&O insurance. We expect local directors to leverage their rich *guanxi* (personal network) to manage personal risk exposure (Jia et al., 2019). In contrast, ORDs have less exposure to the Confucian culture and, thus, are unlikely to be affected by it. In terms of *guanxi*, ORDs are weak. Therefore, ORDs will likely use a formal mechanism, such as D&O insurance, to mitigate personal risk exposure. Collectively, the core testable hypothesis is as follows:

**H1**. Firms with ORDs are more likely to provide D&O insurance than those without ORDs.

Next, we discuss the impact of internationalization on D&O insurance demand. ORDs have the overseas experience that enables them to leverage the best managerial practices when advising their firms (Jones and Romer, 2010; Giannetti et al., 2015). We argue that if a firm's internationalization level is high, the ORDs' impact on demand for D&O insurance is salient for two reasons. First, a high internationalization firm implies that the firm is more dependent on foreign markets. Thus, the firm's risk exposure is higher than an otherwise equivalent firm with low internationalization. The firm has an increased D&O insurance demand to manage the risk. Second, when a firm has high internationalization, its business operation is considerably complex (Carpenter et al., 2004). Thus, the impact of ORDs on D&O insurance demand is salient for complex firms. When a firm has high internationalization, the effects of ORDs on D&O insurance demand are more salient. The testable hypothesis is as follows:

**H2**. The impact of ORDs on D&O insurance demand is more salient for firms with high internationalization.

The business environment shapes the firm behavior. In China's economic development, some provinces have higher marketization (i.e., highly rely on the market in conducting business activities) than others (Fan et al., 2011). When firms are in a high marketization province, they face less government intervention, and legal contracts are well protected. Accordingly, resource allocation is efficient for firms in these high marketization locations. Thus, we hypothesize that firms in high marketization provinces are more likely to use D&O insurance to engage in risk management than those in low marketization provinces. The third testable hypothesis is the following:

**H3**. The impact of ORDs on D&O insurance demand is more salient for firms in high marketization provinces.

## 3. Research design

### *3.1. Sample selection*

We examined all A-share public firms on the Shanghai and Shenzhen Stock Exchanges from 2008 to 2018. We began in 2008 because it was the first year the China Stock Market and Accounting Research (CSMAR) database provided information on firms' ORDs. The initial sample had 28,554 firm-years from 3643 firms. We deleted the firm-years with missing data (7,021), as well as those in financial distress (744), those that belonged to the financial industry (241), and those that were in an industry where no firms had D&O insurance (479). The final sample had 20,069 firm-years from 2866 firms. Table 1 presents the sample size changes in each step.

The data on D&O insurance was retrieved from the Chinese Research Data Services Platform. The ORD data for each firm was retrieved from the CSMAR database and supplemented with ORD information from various public channels, such as internet websites, annual reports, and

**Table 1**
Sample selection process.
Table 1 presents the sample selection process.

|  | N | Number of firms |
|---|---|---|
| A-share firms in 2008–2018 | 28,554 | 3643 |
| Less: firm-years with missing data | (7021) | (658) |
| Less: firm-years with financial distressed | (744) | (4) |
| Less: financial industry firm-years | (241) | (33) |
| Less: firm-years in an industry without any firm having D&O insurance | (479) | (82) |
| Final sample | 20,069 | 2866 |

media. For country-level cultural distance, we follow Hofstede (2001).[2] Other firm-level accounting and financial information were from CSMAR. We winsorized all continuous variables at the 1% and 99% levels and used Stata 16 to conduct the analysis.

### 3.2. *Variable definitions*

Chinese firms are not required to disclose D&O insurance premiums and coverage amounts. Hence, we follow Zou et al. (2008) and Jia et al. (2019) and use a (1, 0) indicator variable to gauge the impact of ORDs on D&O insurance.[3] Specifically, we defined *DOLI* as a (1, 0) indicator variable with a value of 1 if a firm provided D&O insurance coverage and 0 otherwise; and *RETURNEE* as a (1, 0) indicator variable with a value of 1 if a firm had at least one ORD, and 0 otherwise. For robustness, we also use the percentage of ORDs on a firm's board (*RETURNEE_PER*) to capture the impact of ORDs on D&O insurance coverage.

For the set of control variables, we follow related literature. Specifically, Jia et al. (2019) document a firm's political connection as a determinant of D&O insurance demand, using a sample of Chinese A-share firms from 2005 to 2014. Similarly, Donelson et al. (2022) consider the impact of a firm's tax aggressiveness on the D&O insurance premiums using a sample of US firms from 1996 to 2016. Hence, we include a political connection variable (*PC*) along with several variables that proxy a firm's tax aggressiveness, such as firm size (*SIZE*), financial leverage (*LEV*), and profitability of a firm (*ROA*).

We consider that a firm's exposure determines its demand for D&O insurance. Hence, we account for a firm's financial risk by including an operating loss variable in the previous year (*LOSS*) and a firm's default risk (*ZSCORE*). In addition, we gauge a firm's litigation risk by using a firm's legal environment (*LAWRISK*) and state-ownership of a firm (*SOE*). These litigation risk factors contribute to a firm's demand for D&O insurance (Jia et al., 2019). Using a sample of Taiwanese firms from 2008 to 2010, Chiang and Lin (2014) report that a firm's corporate transparency determines the propensity for insurance in Taiwan. Therefore, we use a firm's discretionary accruals (*DA*) to gauge a firm's transparency.

Core (1997) studies 222 Canadian firms in 1993 and 1994 and shows that the demand for D&O insurance also depends on a firm's corporate governance level. Similarly, Zou et al. (2008) examine a sample of Chinese firms from 2000 to 2004 and report similar findings to Core (1997). Hence, we use board size (*BOARD*), the duality of CEO and chairperson (*DUAL*), ownership concentration (*TOP1*), and institutional investor ownership (*INSTITUTION*) to capture a firm's corporate governance level. Last, we include a firm's corporate social responsibility level (*CSR*) and corporate investment efficiency (*INVEST*) to account for their possible impact on purchasing D&O insurance. The detailed definitions of variables are presented in Table 2.

### 3.3. *Summary statistics*

Panel A of Table 3 presents the summary statistics. The mean and standard deviation of *RETURNEE* are 0.411 and 0.492, respectively, suggesting that approximately 41% of the firms have at least one ORD, and the variation is significant. Regarding *DOLI*, the mean and standard deviation are 0.072 and 0.259, respectively, showing that only 7.2% of firms provide D&O insurance and that the variation is significant.

The mean shareholding of the largest shareholder is 34.9%. The mean of institutional investor ownership is 46.5%, and 7.7% of our

**Table 2**
Variable definitions.
Table 2 presents the definitions of all major variables. CSMAR is the China Stock Market and Accounting Research database. CNRDS is the Chinese Research Data Services Platform.

| Variables | Definitions | Data sources |
|---|---|---|
| *RETURNEE* | A dummy variable with a value of 1 if a board has at least one overseas returnee director (ORD) and 0 otherwise | CSMAR and hand-collected |
| *RETURNEE_PER* | The ratio of the number of ORDs to the board size | |
| *DOLI* | A dummy variable with a value of 1 if a firm provides director and officer liability insurance and 0 otherwise | CNRDS |
| *SIZE* | The natural logarithm of total assets | CSMAR |
| *LEV* | Total liabilities to total assets ratio | CSMAR |
| *ROA* | Net income to total assets ratio | CSMAR |
| *LOSS* | If a firm has operating loss at *t-1*, the value is 1 (at *t*) and 0 otherwise | CSMAR |
| *BOARD* | The natural logarithm of the number of directors in a board | CSMAR |
| *DUAL* | A dummy variable with a value of 1 if CEO and chairperson are the same individuals and 0 otherwise | CSMAR |
| *TOP1* | The percentage ownership of the largest shareholder. A large value means high ownership concentration | CSMAR |
| *INSTITUTION* | The percentage ownership of institutional investors | CSMAR |
| *PC* | If a firm's CEO or chairperson has prior government experience, the value is 1 and 0 otherwise | Based on CSMAR and validated with other public sources |
| *ZSCORE* | A firm's default risk, which is 1.2*(operating cashflow/total asset) + 1.4*(retained earnings/total assets) + 3.3* (earnings before interests and taxes/total asset) + 0.6*(market value of shareholders' equity/market value of debt) + 0.999*(total revenue/total assets). A high value means a low default risk. | CSMAR |
| *LAWRISK* | Corporate legal risk | Hand-collected |
| *CSR* | A value of 1 if a firm discloses its corporate social responsibility report and 0 otherwise | CSMAR |
| *INVSET* | Use Richardson (2006) model to calculate investment efficiency. A large value means low efficiency. We follow Richardson (2006) to estimate the following corporate investment function: $INV_{i,t} = \beta_0 + \beta_1 ASSET\_GROWTH_{i,t-1} + \beta_2 LEV_{i,t-1} + \beta_3 CASH_{i,t-1} + \beta_4 SIZE_{i,t-1} + \beta_5 INV_{i,t-1} + \beta_6 AGE_{i,t-1} + \beta_7 RETURN_{i,t-1} + \varepsilon_{i,t}$ where *INV* is a firm's new corporate investment, which is (cash paid to buy tangible and intangible fixed assets + net cash paid to subsidiaries − cash receipts from disposal of long-term tangible and intangible assets-cash receipts from disposal of subsidiaries − depreciation and amortization)/total assets at the beginning of the period; *ASSET_GROWTH* is the growth rate of a firm's total assets; *LEV* is total liabilities to total assets ratio; *CASH* is operating cash flow to total asset ratio; *SIZE* is the natural logarithm of total assets; *AGE* is the natural logarithm of the number of listing years; and *RETURN* is the annual stock return. The residual is the investment efficiency metric. | CSMAR |
| *DA* | Discretionary accrual value using a modified Jones model (Kothari et al., | CSMAR |

(*continued on next page*)

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[2] https://geerthofstede.com/research-and-vsm/dimension-data-matrix/.

[3] Chinese firms are not required to disclose D&O insurance premiums or coverage amounts. Therefore, there are a lot of "zeros" when using insurance premiums or coverage amounts as dependent variables. Specifically, for firm-years having D&O insurance (N = 1449), only 10.4% (N = 151) disclosed insurance premiums and 8.6% (N = 124) disclosed coverage amounts.

**Table 2** (*continued*)

| Variables | Definitions | Data sources |
|---|---|---|
| | 2005). We use the absolute value. A high value means poor earnings quality. Essentially, we use equation below to estimate total accruals (*TA*) as a function of total assets (*ASSET*), change in revenue (*ΔSALES*), and property, plant, and equipment (*PPE*) by industry and year. Then, we use the residuals as the discretionary accruals. $(TA_{i,t}/ASSET_{i,t-1}) = k_1(1/ASSET_{i,t-1}) + k_2(\Delta SALES_{i,t}/ASSET_{i,t-1}) + k3(PPE_{i,t}/ASSET_{i,t-1}) + \varepsilon_{i,t}$ | |
| *SOE* | If a firm is state-owned, the value is 1 and 0 otherwise. | CSMAR |
| *TALENT* | The number of young talents in the province (or an autonomous city) where a firm is located | Hand-collected |
| *CONCESSION* | A dummy variable with a value of 1 if a firm is located in a city with a historical concession in the Qing Dynasty and 0 otherwise | Hand-collected |
| *SPECIALIST* | The natural logarithm of the number of insurance professors in the region where a firm is located plus 1 | CSMAR |
| *ABNPERK* | We follow Zhang et al. (2020) to estimate a firm's abnormal perk expense: $\mathrm{PERK}_{i,t}/\mathrm{SALES}_{i,t}(\%) = \alpha_0 + \alpha_1 \mathrm{COMP}_{i,t} + \alpha_2 \mathrm{SIZE}_{i,t} + \alpha_3 \mathrm{INCOME}_{i,t} + \varepsilon_{i,t}$ where PERK is a firm's travel, entertainment, donation, and fine expenses; SALES is a firm's total revenue; COMP is the natural logarithm of employees' total compensation; SIZE is the natural logarithm of a firm's total assets; and INCOME is the per capita income of the province where a firm is located. The residuals of the regression gauge firms' abnormal management expense, which captures firms' corporate governance level. A large residual (denoted as *ABNPERK*) suggests the corporate governance level is poor. | CSMAR |
| *AC1* | Sales to total assets ratio | CSMAR |
| *AC2* | Other receivables to total assets ratio | CSMAR |

sample had an operating loss. In addition, 22.1% of the sample had CEOs who were also chairpersons. Other control variables do not exhibit an unusual profile.

Panel B of Table 3 reports the univariate test results of ORDs. The mean of *DOLI* for the ORD firms is 0.099, while that of non-ORD firms is 0.054. The difference is significant at the 1% level. The univariate analysis offers preliminary support to the H1. Some other control variables exhibit significant differences.

Table 4 reports Pearson pairwise correlation coefficients. The largest coefficient is 0.605 (between *LEV* and *ZSCORE*), which is expected. Except for *TOP1* and *INSTITUTION* (correlation coefficient of 0.554), the remaining coefficients are all less than 0.5. Hence, multicollinearity, if any, is not severe. The variance inflation factors (VIF) are well below 10, suggesting that multicollinearity is low.

## 4. Results and discussions

### 4.1. Baseline results

To examine H1, we first study the logic behind H1. That is, having D&O insurance enhances a firm's corporate governance. We present the discussions and results in Appendix A. The results corroborate with the logic. Then, we used Eq. (1) below:

$$DOLI_{i,t} = \alpha_0 + \alpha_1\, RETURNEE_{i,t} + CONTROL_{i,t} + YEAR + INDUSTRY + \varepsilon_{i,t,} \quad (1)$$

**Table 3**
Summary statistics.
Table 3 Panel A shows the summary statistics of major variables. In Panel B, we present the univariate analysis by firms with and without ORDs. Definitions of variables are shown in Table 2. ***, **, and * indicate 1%, 5%, and 10% significant, respectively.

Panel A the summary statistics of all variables

| Variables | N | Mean | SD | Min | Median | Max |
|---|---|---|---|---|---|---|
| *DOLI* | 20,069 | 0.072 | 0.259 | 0.000 | 0.000 | 1.000 |
| *RETURNEE* | 20,069 | 0.411 | 0.492 | 0.000 | 0.000 | 1.000 |
| *RETURNEE_PER* | 20,069 | 0.069 | 0.100 | 0.000 | 0.000 | 0.444 |
| *SIZE* | 20,069 | 22.215 | 1.278 | 19.746 | 22.052 | 26.097 |
| *LEV* | 20,069 | 0.458 | 0.206 | 0.059 | 0.458 | 0.902 |
| *ROA* | 20,069 | 0.034 | 0.057 | −0.222 | 0.032 | 0.189 |
| *LOSS* | 20,069 | 0.077 | 0.267 | 0.000 | 0.000 | 1.000 |
| *BOARD* | 20,069 | 2.267 | 0.179 | 1.792 | 2.303 | 2.773 |
| *DUAL* | 20,069 | 0.221 | 0.415 | 0.000 | 0.000 | 1.000 |
| *TOP1* | 20,069 | 34.938 | 15.087 | 8.530 | 32.970 | 74.980 |
| *INSTITUTION* | 20,069 | 46.522 | 23.323 | 0.451 | 48.752 | 90.791 |
| *PC* | 20,069 | 0.361 | 0.480 | 0.000 | 0.000 | 1.000 |
| *ZSCORE* | 20,069 | 4.667 | 5.680 | 0.068 | 2.870 | 37.001 |
| *LAWRISK* | 20,069 | 9.282 | 5.132 | 1.040 | 8.400 | 21.570 |
| *CSR* | 20,069 | 0.275 | 0.447 | 0.000 | 0.000 | 1.000 |
| *INVEST* | 20,069 | 0.048 | 0.058 | 0.001 | 0.030 | 0.355 |
| *DA* | 20,069 | 0.063 | 0.069 | 0.001 | 0.043 | 0.412 |
| *SOE* | 20,069 | 0.457 | 0.498 | 0.000 | 0.000 | 1.000 |

Panel B Univariate analysis

| Variables | Firms with ORDs | Firms without ORDs | *Difference* | *T-Statistic* |
|---|---|---|---|---|
| | (N = 8248) | (N = 11,821) | | |
| | Mean | Mean | | |
| *DOLI* | 0.099 | 0.054 | 0.045*** | 12.155 |
| *SIZE* | 22.377 | 22.102 | 0.275*** | 15.079 |
| *LEV* | 0.449 | 0.464 | −0.016*** | −5.364 |
| *ROA* | 0.038 | 0.031 | 0.007*** | 8.295 |
| *LOSS* | 0.066 | 0.085 | −0.019*** | −5.043 |
| *BOARD* | 2.284 | 2.255 | 0.028*** | 11.084 |
| *DUAL* | 0.248 | 0.203 | 0.044*** | 7.445 |
| *TOP1* | 34.910 | 34.958 | −0.049 | −0.225 |
| *INSTITUTION* | 47.434 | 45.886 | 1.548*** | 4.628 |
| *PC* | 0.376 | 0.351 | 0.025*** | 3.646 |
| *ZSCORE* | 4.935 | 4.479 | 0.456*** | 5.605 |
| *LAWRISK* | 9.990 | 8.789 | 1.201*** | 16.423 |
| *CSR* | 0.319 | 0.245 | 0.074*** | 11.621 |
| *INVEST* | 0.049 | 0.047 | 0.002* | 1.879 |
| *DA* | 0.062 | 0.064 | −0.002* | −1.944 |
| *SOE* | 0.388 | 0.505 | −0.117*** | −16.496 |

The variables of Eq. (1) are defined in Section 3.2. In Eq. (1), we include year and industry fixed effects to account for variations across the two. Because *DOLI* is a dummy variable, we followed Zou et al. (2008) and Jia et al. (2019) to estimate Eq. (1) by a pooled-probit regression.[4]

We present the findings for Eq. (1) in Table 5. We included the results for the full and simplified models with *RETURNEE* and *RETURNEE_PER* for robustness. Consistently across all four columns, the coefficients of *RETURNEE* and *RETURNEE_PER* are positive and significant at the 1% level. If a firm has ORDs or a strong presence of ORDs, it is likely to provide D&O insurance, and the results are economically significant. Using column (2), the coefficient of *RETURNEE* is 0.256, which is equivalent to 29% ($e^{0.256}$–1) more likelihood of having D&O insurance

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[4] We do not control for firm fixed effect in Eq. (1). In our sample of 2866 distinct firms, there are 2637 firms having *DOLI* = 0 (approximately 92%; 2637/2866) never had D&O insurance during the sample period. If we used fixed effect or random effect models, the estimation do not converge due to not sufficient variation within a firm. Thus, the Hausman test cannot be applied to Eq. (3). Therefore, we follow Zou et al. (2008), Hwang and Kim (2016), and Jia et al. (2019) to use a pooled probit model.

**Table 4**
Correlation matrix.
Table 4 reports the correlation coefficients and VIF (when the explanatory variable is *RETURNEE*). **, **, and * indicate 1%, 5%, and 10% significant, respectively.

| *Variables* | *VIFs* | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---|---|---|---|---|---|---|---|---|---|---|
| *(1) DOLI* | | 1 | | | | | | | | |
| *(2) RETURNEE* | 1.07 | 0.085*** | 1 | | | | | | | |
| *(3) RETURNEE_PER* | | 0.118*** | 0.822*** | 1 | | | | | | |
| *(4) SIZE* | 2.34 | 0.218*** | 0.106*** | 0.106*** | 1 | | | | | |
| *(5) LEV* | 2.34 | 0.116*** | −0.038*** | −0.048*** | 0.452*** | 1 | | | | |
| *(6) ROA* | 1.38 | −0.021*** | 0.058*** | 0.059*** | 0.046*** | −0.354*** | 1 | | | |
| *(7) LOSS* | 1.10 | 0.014* | −0.036*** | −0.033*** | −0.073*** | 0.128*** | −0.238*** | 1 | | |
| *(8) BOARD* | 1.21 | 0.067*** | 0.078*** | −0.031*** | 0.252*** | 0.159*** | 0.033*** | −0.013* | 1 | |
| *(9) DUAL* | 1.13 | −0.070*** | 0.052*** | 0.060*** | −0.140*** | −0.130*** | 0.025*** | −0.019*** | −0.180*** | 1 |
| *(10) TOP1* | 1.53 | 0.050*** | −0.002 | 0.003 | 0.247*** | 0.081*** | 0.121*** | −0.058*** | 0.032*** | −0.069*** |
| *(11) INSTITUTION* | 1.97 | 0.162*** | 0.033*** | 0.031*** | 0.429*** | 0.208*** | 0.133*** | −0.041*** | 0.228*** | −0.199*** |
| *(12) PC* | 1.05 | −0.009 | 0.026*** | 0.025*** | 0.031*** | −0.006 | 0.048*** | −0.042*** | 0.043*** | −0.042*** |
| *(13) ZSCORE* | 1.82 | −0.065*** | 0.040*** | 0.051*** | −0.378*** | −0.605*** | 0.270*** | −0.038*** | −0.147*** | 0.101*** |
| *(14) LAWRISK* | 1.41 | 0.034*** | 0.115*** | 0.129*** | 0.048*** | −0.145*** | 0.050*** | −0.057*** | −0.126*** | 0.144*** |
| *(15) CSR* | 1.32 | 0.143*** | 0.082*** | 0.080*** | 0.444*** | 0.121*** | 0.086*** | −0.051*** | 0.141*** | −0.089*** |
| *(16) INVEST* | 1.11 | −0.018** | 0.013* | 0.021*** | −0.106*** | −0.092*** | 0.046*** | 0.028*** | −0.062*** | 0.052*** |
| *(17) DA* | 1.09 | −0.017** | −0.014* | −0.012 | −0.055*** | 0.106*** | −0.129*** | 0.064*** | −0.067*** | 0.019*** |
| *(18) SOE* | 1.54 | 0.151*** | −0.116*** | −0.146*** | 0.292*** | 0.273*** | −0.070*** | 0.036*** | 0.271*** | −0.283*** |

| *Variables* | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) |
|---|---|---|---|---|---|---|---|---|---|
| *(10) TOP1* | 1 | | | | | | | | |
| *(11) INSTITUTION* | 0.554*** | 1 | | | | | | | |
| *(12) PC* | 0.000 | 0.012 | 1 | | | | | | |
| *(13) ZSCORE* | −0.088*** | −0.110*** | −0.032*** | 1 | | | | | |
| *(14) LAWRISK* | −0.013* | −0.131*** | −0.032*** | 0.072*** | 1 | | | | |
| *(15) CSR* | 0.112*** | 0.228*** | 0.040*** | −0.080*** | 0.021*** | 1 | | | |
| *(16) INVEST* | −0.054*** | −0.035*** | −0.017** | 0.162*** | 0.016** | −0.078*** | 1 | | |
| *(17) DA* | −0.021*** | −0.015** | −0.006 | −0.019*** | −0.016** | −0.059*** | 0.074*** | 1 | |
| *(18) SOE* | 0.244*** | 0.416*** | −0.051*** | −0.187*** | −0.240*** | 0.211*** | −0.122*** | −0.049*** | 1 |

for a firm with ORDs than without. Thus, the findings support H1.

For control variables, if they are significant in columns (2) and (4), they carry the expected signs. For example, the coefficients of *SIZE, LEV, LOSS, INSTITUTION, ZSCORE, LAWRISK, ZSCORE, CSR,* and *SOE* are positive and significant at the 1% or 5% level. When a firm is large, highly leveraged, had an operating loss in the previous year, has more independent directors, has high institutional investor ownership, has high default risk, is located in a strong legal environment, and engages in CSR or a state-owned firm, its demand for D&O insurance is higher than those where it does not possess the above features. The findings are consistent with those in Zou et al. (2008). In contrast, the coefficients of *ROA, BOARD, DUAL, TOP1,* and *PC* are consistently negative and significant at the conventional level, consistent with prior studies (Lai and Tai, 2018; Jia et al., 2019).

### 4.2. *The effects of internationalization and marketization*

To examine H2, we classify a firm as high and low internationalization if it had or did not have foreign subsidiaries, respectively. We then reexamined Eq. (1) using high and low internationalization subsamples. We report the findings in Table 6. The coefficients of *RETURNEE* and *RETURNEE_PER* are all positively significant at the 1% level in all four columns. However, the coefficients are larger in the high internationalization subsamples than those of the low internationalization level. The results support H2.

For H3, we used the marketization index reported in Fan et al. (2013) to classify firms into high (top 25 percentile) and low (bottom 25 percentile) subsamples. We present the results in Table 7. Similar to Table 6, the coefficients of *RETURNEE* and *RETURNEE_PER* are all positively significant at the 1% level in all four columns, with the magnitudes of the coefficients being larger in the high marketization subsamples than those of low marketization. The results support H3.

### 4.3. *Robustness checks*

We conducted several robustness checks below for H1.

#### 4.3.1. *Instrumental variable*

Corporate demand for D&O insurance and *RETURNEE* may be endogenously determined. It is because a firm has (or is more likely to have) D&O insurance attracts more ORDs to join the firm as directors.[5] We use an IV approach to mitigate the issue. Specifically, we used two IVs. First, we follow Ang et al. (2014) to identify whether the headquarters of a firm was in a historical concession province or an autonomous city. These concession provinces or autonomous cities received an early impact from Western culture right at the beginning because they opened to international trade early on. We define *CONCESSION* as a dummy variable with a value of 1 if a firm is located in a city with a historical concession in the Qing Dynasty and 0 otherwise.[6] Second, we use the number of young talents in the province (or an autonomous city) where a firm is located (*TALENT*). The Chinese government has a young talent program that awards substantial grants to influence overseas Chinese young professionals to relocate to China. We argue that *CONCESSION* or *TALENT* in a city is positively correlated with the likelihood of a local firm having an ORD (*RETURNEE* or *RETURNEE_PER*), but *CONCESSION* or *TALENT* is not correlated with a firm's decision with regards to D&O insurance provision. Individuals are more likely to work and study overseas and then return to China if they are from concession cities or associated with a young talent program. However, a firm's location in a concession province or autonomous city does not affect its decision to acquire D&O insurance. Similarly, *TALENT* is not correlated with a firm's decision to provide D&O insurance.

We present the findings in Table 8. For the first stage regression in columns (1), (3), (5), and (7), the coefficients of *TALENT* and

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[5] Specifically, we modify Eq. (3) to use *RETURNEE* and *RETURNEE_PER* as dependent variables and *DOLI* as the explanatory variable to run an ordinary least squares regression. The coefficients of *DOLI* are positively significant at the 1% level. Hence, by having D&O insurance, a firm can attract more ORDs to join the firm. The results are available upon request.

[6] The concession provinces and autonomous cities are Shanghai, Guangdong, Fujian, Tianjin, Jiangsu, Hubei, Chongqing, Jiangxi, Beijing, and Zhejiang.

**Table 5**
The impact of overseas returnee directors (ORDs) on the demand for directors' and officers' liability insurance (D&O insurance).
Table 5 presents the results for the impact of ORDs on D&O insurance using probit regression. Z-statistics are reported in parentheses. Definitions of variables are shown in Table 2. ***, **, and * indicate 1%, 5%, and 10% significant, respectively.

| Variables | Dependent var. = *DOLI* (1 for having D&O insurance and 0 otherwise) | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| *RETURNEE* | 0.344*** | 0.256*** | | |
| | (12.48) | (8.73) | | |
| *RETURNEE_PER* | | | 1.955*** | 1.689*** |
| | | | (16.17) | (12.71) |
| *SIZE* | | 0.150*** | | 0.135*** |
| | | (9.04) | | (8.18) |
| *LEV* | | 0.575*** | | 0.595*** |
| | | (5.00) | | (5.17) |
| *ROA* | | −0.941*** | | −0.896*** |
| | | (−2.97) | | (−2.82) |
| *LOSS* | | 0.125** | | 0.123** |
| | | (2.26) | | (2.22) |
| *BOARD* | | −0.274*** | | −0.164** |
| | | (−3.37) | | (−2.01) |
| *DUAL* | | −0.146*** | | −0.144*** |
| | | (−3.41) | | (−3.35) |
| *TOP1* | | −0.012*** | | −0.012*** |
| | | (−10.09) | | (−9.82) |
| *INSTITUTION* | | 0.011*** | | 0.011*** |
| | | (10.71) | | (10.26) |
| *PC* | | −0.065** | | −0.070** |
| | | (−2.09) | | (−2.25) |
| *ZSCORE* | | 0.015*** | | 0.014*** |
| | | (3.97) | | (3.74) |
| *LAWRISK* | | 0.028*** | | 0.027*** |
| | | (8.85) | | (8.52) |
| *CSR* | | 0.137*** | | 0.132*** |
| | | (4.15) | | (3.96) |
| *INVEST* | | 0.321 | | 0.308 |
| | | (1.18) | | (1.12) |
| *DA* | | −0.094 | | −0.075 |
| | | (−0.42) | | (−0.34) |
| *SOE* | | 0.365*** | | 0.395*** |
| | | (10.29) | | (11.02) |
| *Intercept* | −1.736*** | −5.043*** | −1.707*** | −4.983*** |
| | (−12.95) | (−13.28) | (−12.81) | (−13.17) |
| *INDUSTRY* | Yes | Yes | Yes | Yes |
| *YEAR* | Yes | Yes | Yes | Yes |
| *N* | 20,069 | 20,069 | 20,069 | 20,069 |
| *No. of firms* | 2866 | 2866 | 2866 | 2866 |
| *Pseudo* $R^2$ | 0.054 | 0.151 | 0.063 | 0.159 |

*CONCESSION*, as expected, are positive and significant at the 1% level, suggesting that when a city has many young talents or is historically in a concession province, firms are likely to have ORDs. We then recover the predicted value of *RETURNEE* or *RETURNEE_PER* (*P_RETURNEE* or *P_RETURNEE_PER*) in Eq. (1). The results in columns (2), (4), (6), and (8) show that the coefficients of *P_RETURNEE* and *P_RETURNEE_PER* continue to be positive and significant at the conventional level. The related Kleibergen-Paap rank LM statistics (for under identification test) is significant, and the F-statistics is larger than 10 (weak identification test), suggesting the IV is appropriate. Our baseline findings in Table 5 are robust.

### 4.3.2. Propensity score matching (PSM)

In addition, ORDs are prone to joining highly profitable, sound corporate governance or high internationalization firms. These firms are also likely to have D&O insurance. Hence, we may have a self-selection issue. To mitigate the possibility, we followed Yuan and Wen (2018) to conduct a propensity score matching (PSM) procedure to match the treatment (those with ORDs) and the control firms (those without ORDs) to mitigate the selection bias. We used a 1:1 matching based on a probit

**Table 6**
The effects of a firm's internationalization for the impact of ORDs on the demand of D&O insurance.
Table 6 presents the effects of a firm's internationalization for the impact of ORDs on the demand of D&O insurance using probit regression. We classify a firm as high (low) internationalization if it has (has no) foreign subsidiaries. For brevity, we do not report coefficients of control variables. Z-statistics are reported in parentheses. Definitions of variables are shown in Table 2. ***, **, and * indicate 1%, 5%, and 10% significant, respectively.

| | Dependent var. = *DOLI* (1 for having D&O insurance and 0 otherwise) | | | |
|---|---|---|---|---|
| | Internationalization | | Internationalization | |
| | *Low* | *High* | *Low* | *High* |
| Variables | (1) | (2) | (3) | (4) |
| *RETURNEE* | 0.148*** | 0.381*** | | |
| | (3.90) | (6.58) | | |
| *RETURNEE_PER* | | | 1.265*** | 1.820*** |
| | | | (6.66) | (8.34) |
| *Control* var. | Yes | Yes | Yes | Yes |
| *Intercept* | −3.601*** | −9.820 | −3.589*** | −9.808 |
| | (−7.59) | (−0.10) | (−7.57) | (−0.10) |
| *INDUSTRY* | Yes | Yes | Yes | Yes |
| *YEAR* | Yes | Yes | Yes | Yes |
| *N* | 14,332 | 5585 | 14,332 | 5585 |
| *No. of firms* | 2396 | 1246 | 2396 | 1246 |
| *Pseudo* $R^2$ | 0.108 | 0.282 | 0.113 | 0.288 |

**Table 7**
The effects of marketization level of a firm's location for the impact of ORDs on the demand of D&O insurance.
Table 7 presents the effects of marketization level of a firm's location for the impact of ORDs on the demand of D&O insurance using probit regression. We classify a firm operates in a high (low) marketization location if is located in a province with above (below) average marketization index. The index is from Fan et al. (2011). For brevity, we do not report coefficients of control variables. Z-statistics are reported in parentheses. Definitions of variables are shown in Table 2. ***, **, and * indicate 1%, 5%, and 10% significant, respectively.

| | Dependent var. = *DOLI* (1 for having D&O insurance and 0 otherwise) | | | |
|---|---|---|---|---|
| | Marketization level | | Marketization level | |
| | *Low* | *High* | *Low* | *High* |
| Variables | (1) | (2) | (3) | (4) |
| *RETURNEE* | 0.222*** | 0.421*** | | |
| | (3.20) | (4.36) | | |
| *RETURNEE_PER* | | | 1.367*** | 2.665*** |
| | | | (4.01) | (6.76) |
| *Control* var. | Yes | Yes | Yes | Yes |
| *Intercept* | 0.333 | −10.958 | 0.250 | −11.119 |
| | (0.39) | (−0.08) | (0.30) | (−0.07) |
| *INDUSTRY* | Yes | Yes | Yes | Yes |
| *YEAR* | Yes | Yes | Yes | Yes |
| *N* | 5282 | 3089 | 5282 | 3089 |
| *No. of firms* | 953 | 718 | 953 | 718 |
| *Pseudo* $R^2$ | 0.145 | 0.245 | 0.148 | 0.265 |

**Table 8**
The impact of overseas returnee directors (ORDs) on the demand for directors and officers liability insurance (D&O insurance): Instrumental variable.
Table 8 presents the results for the impact of ORDs on D&O insurance using an instrumental variable (IV) method. We use as IVs the number of young talents in the province (or an autonomous city) in which a firm is located (*TALENT*) and whether the province (or an autonomous city) in which a firm is located was a historically concession city in the Qing Dynasty (*CONCESSION* is 1 if yes and 0 otherwise). We use the predicted value of *RETURNEE* or *RETURNEE_PER* (*P_RETURNEE* or *P_RETURNEE_PER*) in Eq. (3). For brevity, we do not report coefficients of control variables. T-statistics are reported in parentheses of columns (1) (3) (5) and (7). Z-statistics are reported in parentheses of columns (2) (4) (6) and (8). Definitions of variables are shown in Table 2. ***, **, and * indicate 1%, 5%, and 10% significant, respectively.

| | RETURNEE | DOLI | RETURNEE_PER | DOLI | RETURNEE | DOLI | RETURNEE_PER | DOLI |
|---|---|---|---|---|---|---|---|---|
| Variables | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| *TALENT* | 0.036*** | | 0.009*** | | | | | |
| | (8.58) | | (10.30) | | | | | |
| *CONCESSION* | | | | | 0.085*** | | 0.017*** | |
| | | | | | (7.63) | | (7.73) | |
| *P_RETURNEE* | | 0.841* | | | | 1.277** | | |
| | | (1.67) | | | | (2.19) | | |
| *P_RETURNEE_PER* | | | | 3.535* | | | | 5.849** |
| | | | | (1.70) | | | | (2.02) |
| *Control* var. | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| *Intercept* | −1.499*** | −4.136*** | −0.215*** | −4.562*** | −1.534*** | −3.482*** | −0.223*** | −4.058*** |
| | (−16.84) | (−4.75) | (−11.38) | (−7.50) | (−17.18) | (−3.57) | (−11.73) | (−5.40) |
| *INDUSTRY* | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| *YEAR* | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| *LM statistics* | *73.059**** | | *104.872**** | | *58.053**** | | *59.704**** | |
| *F value of First stage* | *73.543* | | *105.993* | | *58.246* | | *59.745* | |
| *N* | 20,069 | 20,069 | 20,069 | 20,069 | 20,069 | 20,069 | 20,069 | 20,069 |
| *No. of firms* | 2866 | 2866 | 2866 | 2866 | 2866 | 2866 | 2866 | 2866 |
| *Adj.* $R^2$ | 0.071 | — | 0.076 | — | 0.070 | — | 0.073 | — |

regression model.[7] The matching variables were the control variables in Eq. (1). We estimate Eq. (1) using the PSM sample. The results are presented in Table 9. Panel A reports the profiles of the sample after the PSM. All the control variables in Eq. (1) exhibit insignificant differences in means for the firms with and without ORDs after the PSM. Thus, the PSM application was successful.

In Panel B, Columns (1–3) show the results of the pre-PSM sample, the PSM allocation procedures by probit, and the results of using the PSM sample. Based on the results in column (3), the coefficient of *RETURNEE* is positive and significant at the 1% level. Therefore, our baseline findings in Table 5 remain qualitatively the same as those of PSM.[8]

### 4.3.3. *Alternative models and samples*

We conduct several additional robustness checks using alternative empirical models and samples. The results are presented in Table 10. First, it is natural that a firm's decision to purchase D&O insurance lags behind the appointment of ORDs; hence, we used the lagged one-period *RETURNEE* and *RETURNEE_PER* (*L.RETURNEE* and *L.RETURNEE_PER*). The results in columns (1) and (2) in Table 10 Panel A show that the coefficients of *L.RETURNEE* and *L.RETURNEE_PER* continue to be positively significant at the 1% level. The results are qualitatively like *RETURNEE* and *RETURNEE_PER* in Table 5.

Second, some Chinese firms are cross-listed overseas. These firms are likely to have ORDs to handle international affairs. We exclude these firms and reexamine Eq. (1). The results in columns (3) and (4) show that the coefficients of *RETURNEE* and *RETURNEE_PER* are positive and significant at the 1% level.

Third, the financial crisis in 2008 may have affected the results. Hence, we remove the 2008 samples and reexamine Eq. (1). The coefficients of *RETURNEE* and *RETURNEE_PER* in columns (5) and (6) of Table 10 Panel A remain positively significant at the 1% level.

Fourth, we account for the effect of CEO or chairperson's characteristics in Eq. (1). Specifically, we include the genders of the CEO or chairperson (*GENDER*). Female CEOs or chairpersons are risk-averse (Zuckerman, 1994). We define *GENDER* as a dummy variable, with 1 if the CEO or chairperson were a female and 0 otherwise. In addition, if the CEO or chairperson was born between 1940 and 1955, they would have experienced the Great Chinese Famine. The traumatic experience drives individuals to be more conservative (Feng and Johansson, 2018), making the firm likely to purchase D&O insurance. We define *FAMINE* as a dummy variable with a value of 1 if the CEO or chairperson was born between 1940 and 1955, and 0 otherwise. Moreover, if the CEO or chairperson has a finance background, they will be receptive to the concept of insurance and, therefore, likely to purchase D&O insurance. We defined *FINANCE* as a dummy variable with a value of 1 if the CEO or chairperson had a finance background and 0 otherwise. In addition, we contend that if the CEO or chairperson has an additional occupation, their business decisions may not be optimal. Thus, they may prefer D&O insurance. We define *MULTI* as a dummy variable with a value of 1 if the CEO or chairperson was a director in another firm, and 0 otherwise. Last, we considered whether the CEO or chairperson received a salary. If not, they were likely to take risks when making corporate decisions. We defined *SALARY* as a dummy variable with a value of 1 if the CEO or chairperson does not collect salary and 0 otherwise.[9]

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[7] We used the 1:1 PSM procedure (instead of 1:2 or 1:3). Austin (2010) used Monte Carlo simulations to examine 1:1, 1:2, 1:3, 1:4, and 1:5 methods in PSM. He reports that increasing the number of control subjects matched to each treated subject increases the estimated treatment effect bias. In contrast, having more control subjects to match with a treated subject lowers the sampling variability of the estimated treatment effect. Using nearest-neighbor matching (which we used), the mean squared error of the estimated treatment effect was minimized in 67.7% of the scenarios when 1:1 matching was used. He recommends using 1:1 or 1:2 in PSM. In addition, given that the N of ORD-firm and non-ORD firm are 8248 and 11,821, respectively, we do not have sufficient control firms to conduct a 1:2 matching. Hence, we used 1:1 matching.

[8] We use a 1:1 matching based on a Probit regression model with the sample sizes of the treatment and control firms are 7424:7424. However, due to the need to control for industry fixed effect, the Probit model requires variation of dependent variable within the same industry. That is, within an industry, we need to have samples with both having and not having D&O insurance. There are seven observations not meeting the requirement in the education industry. Thus, the sample size drops to 7421:7420 in Table 9.

[9] Additional control variables including *GENDER, FAMINE, FINANCE, MULTI, SALARY* are from CSMAR.

**Table 9**
The impact of overseas returnee directors (ORDs) on the demand for directors and officers liability insurance (D&O insurance): Propensity score matching (PSM).
Table 9 presents the results for the impact of ORDs on D&O insurance using a PSM method. All Z-statistics are reported in parentheses in Panel B. Definitions of variables are shown in Table 2. ***, **, and * indicate 1%, 5%, and 10% significant, respectively.

Panel A: Differences in matching variables

| Matching Variables | Companies with ORDs (N = 7424) | Companies without ORDs (N = 7424) | Difference | T-Statistic |
|---|---|---|---|---|
| | Mean | Mean | | |
| *SIZE* | 22.251 | 22.259 | −0.008 | −0.409 |
| *LEV* | 0.449 | 0.450 | −0.001 | −0.173 |
| *ROA* | 0.036 | 0.036 | −0.000 | −0.049 |
| *LOSS* | 0.070 | 0.071 | −0.000 | −0.096 |
| *BOARD* | 2.271 | 2.273 | −0.002 | −0.585 |
| *DUAL* | 0.236 | 0.239 | −0.004 | −0.501 |
| *TOP1* | 34.975 | 34.862 | 0.113 | 0.457 |
| *INSTITUTION* | 46.294 | 46.238 | 0.056 | 0.144 |
| *PC* | 0.367 | 0.373 | −0.007 | −0.833 |
| *ZSCORE* | 4.736 | 4.791 | −0.056 | −0.594 |
| *LAWRISK* | 9.669 | 9.735 | −0.065 | −0.779 |
| *CSR* | 0.286 | 0.291 | −0.005 | −0.670 |
| *INVEST* | 0.049 | 0.049 | −0.000 | −0.058 |
| *DA* | 0.063 | 0.062 | 0.001 | 0.598 |
| *SOE* | 0.404 | 0.400 | 0.004 | 0.469 |

Panel B: PSM Results

| | Dependent var. = *DOLI* (1 for having D&O insurance and 0 otherwise) | | |
|---|---|---|---|
| | Full sample | Probit regression | PSM sample |
| Variables | (1) | (2) | (3) |
| *RETURNEE* | 0.256*** | | 0.240*** |
| | (8.73) | | (7.02) |
| *SIZE* | 0.150*** | 0.147*** | 0.145*** |
| | (9.04) | (13.51) | (7.29) |
| *LEV* | 0.575*** | −0.201*** | 0.383*** |
| | (5.00) | (−2.98) | (2.85) |
| *ROA* | −0.941*** | −0.189 | −0.905** |
| | (−2.97) | (−1.00) | (−2.42) |
| *LOSS* | 0.125** | −0.024 | 0.091 |
| | (2.26) | (−0.67) | (1.36) |
| *BOARD* | −0.274*** | 0.746*** | −0.309*** |
| | (−3.37) | (13.26) | (−3.05) |
| *DUAL* | −0.146*** | 0.108*** | −0.152*** |
| | (−3.41) | (4.65) | (−3.00) |
| *TOP1* | −0.012*** | −0.002** | −0.014*** |
| | (−10.09) | (−2.40) | (−9.59) |
| *INSTITUTION* | 0.011*** | 0.003*** | 0.013*** |
| | (10.71) | (6.14) | (10.45) |
| *PC* | −0.065** | 0.043** | −0.054 |
| | (−2.09) | (2.22) | (−1.49) |
| *ZSCORE* | 0.015*** | 0.011*** | 0.008* |
| | (3.97) | (5.24) | (1.89) |
| *LAWRISK* | 0.028*** | 0.021*** | 0.033*** |
| | (8.85) | (9.96) | (8.82) |
| *CSR* | 0.137*** | 0.121*** | 0.103*** |
| | (4.15) | (5.21) | (2.63) |
| *INVEST* | 0.321 | 0.152 | 0.127 |
| | (1.18) | (0.91) | (0.39) |
| *DA* | −0.094 | −0.009 | 0.109 |
| | (−0.42) | (−0.07) | (0.42) |
| *SOE* | 0.365*** | −0.401*** | 0.414*** |
| | (10.29) | (−17.60) | (10.13) |
| *Intercept* | −5.043*** | −5.494*** | −5.231*** |
| | (−13.28) | (−21.53) | (−10.27) |
| *INDUSTRY* | Yes | Yes | Yes |
| *YEAR* | Yes | Yes | Yes |
| *N* | 20,069 | 20,069 | 14,841 |
| *No. of firms* | 2866 | 2866 | 2796 |
| *Pseudo* $R^2$ | 0.151 | 0.053 | 0.164 |

We present the findings of Eq. (1) with augmented CEO or chairperson characteristics in columns (7) and (8) of Table 10, Panel A. After accounting for these variables, the coefficients of *RETURNEE* and *RETURNEE_PER* continue to be positive and significant at the 1% level. The results support H1. The effect of ORDs on demand for D&O insurance remains intact after accounting for firm and CEO and chairperson characteristics.

Last, we use alternative dependent variables in Eq. (1) for robustness. Specifically, we used the natural logarithm of 1 plus D&O insurance premium (*PREMIUM*) and the natural logarithm of 1 plus D&O insurance coverage (*COVERAGE*) as alternative dependent variables. The results in Panel B of Table 10 show that the coefficients of *RETURNEE* and *RETURNEE_PER* continue to be positively significant at the 1% level. Collectively, the results in Panels A and B of Table 10 show that H1 is robust.

### 4.4. Cross-sectional analysis

The results from Tables 5–10 support H1. We do not know whether ORDs from other countries are homogeneous. To explore the impact of heterogeneous ORDs, we leverage the insights of Hofstede (1980, 2001) on national culture to examine how different national cultures, especially those related to interpersonal power distance, individualism, and uncertainty avoidance, may moderate our baseline findings.[10]

Interpersonal power distance reflects the acceptance of power by people with weaker financial status in society. Individualism is an indicator to gauge whether a society focuses on the interests of individuals or organizations. Uncertainty avoidance gauges a firm's attitude toward risk. In a high-uncertainty environment, a firm will likely use D&O insurance to manage risk exposure. We contend that these three elements of Hofstede's cultural dimensions moderate the impact of ORDs on demand for D&O insurance.

Precisely, we use the following steps:

1) We identify the origin country of each ORD. We then assign the interpersonal power distance score to each firm. If a firm had over one ORD, we consider the median score.
2) Only using firms with at least one ORD, we classify the firms into a high-vs. low-interpersonal power distance sample using the median.
3) We combine the high (low) ORDs sample with firms without ORDs.
4) We reexamine Eq. (1) with the subsamples in step (3).
5) We repeat the analysis using the individualism and uncertainty avoidance score.

We present the findings in Panels A and B of Table 11. Across columns (1–4) in Panel A, we find that the coefficients of *RETURNEE* and *RETURNEE_PER* remain positive and significant at the 1% level for the low interpersonal power distance subsample, while the same coefficients are not significant for the high interpersonal power distance subsample. As for individualism, the results in columns (5–8) of Panel A suggest that the impact of ORDs on D&O insurance for high individualism subsamples remained the same as those in Table 5; however, the same coefficients are not significant for the low individualism subsample. For uncertainty avoidance, the results in Panel B of Table 11 show that the coefficients of *RETURNEE* and *RETURNEE_PER* are positive and

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[10] The six cultural dimensions of Hofstede include power distance, uncertainty avoidance, individualism, masculinity, long-term orientation, and indulgence. We used only power distance, uncertainty avoidance, and individualism dimensions because these elements directly impact ORDs' risk tolerance level and risk behavior, which directly contribute to the demand for D&O insurance. We do not use those of Schwartz (Schwartz Values Survey, or SVS) because Hofstede's cultural dimensions cover uncertainty avoidance and individualism, which are relevant to demand for D&O insurance. The SVS does not have uncertainty and individualism dimensions.

**Table 10**

The impact of overseas returnee directors (ORDs) on the demand for directors' and officers' liability insurance (D&O insurance): Robustness checks.

Table 10 presents the results for the impact of ORDs on D&O insurance using several robustness checks. Panel A presents the results with alternative methods and sample. Panel B presents the results using alternative dependent variables. Panel A columns (1) and (2) use the lagged one period *RETURNEE* and *RETURNEE_PER* (*L.RETURNEE* and *L.RETURNEE_PER*) to minimize endogeneity issue. Columns (3) and (4) confine to firms without cross-listing. Columns (5) and (6) exclude 2008 data. Columns (7) and (8) add additional control variables. For brevity, we do not report coefficients of some control variables in Panel A. *Z*-statistics are reported in parentheses of Panel A. Panel B columns (1) and (2) use *PREMIUM* as dependent variable. Columns (3) and (4) use *COVERAGE* as dependent variable. *T*-statistics are reported in parentheses of Panel B. Definitions of variables are shown in Table 2. ***, **, and * indicate 1%, 5%, and 10% significant, respectively.

Panel A: Alternative method and sample

Dependent var. = *DOLI* (1 for having D&O insurance, and 0 otherwise)

| | Lag explanatory variable | | Excluded cross-listing firms | | Deleted samples in 2008 | | Included additional control variables | |
|---|---|---|---|---|---|---|---|---|
| *Variables* | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| *L.RETURNEE* | 0.290***<br>(9.20) | | | | | | | |
| *L.RETURNEE_PER* | | 1.818***<br>(12.70) | | | | | | |
| *RETURNEE* | | | 0.179***<br>(5.75) | | 0.257***<br>(8.53) | | 0.252***<br>(8.53) | |
| *RETURNEE_PER* | | | | 1.455***<br>(9.87) | | 1.680***<br>(12.33) | | 1.668***<br>(12.45) |
| *GENDER* | | | | | | | 0.171***<br>(3.48) | 0.178***<br>(3.61) |
| *FAMINE* | | | | | | | 0.050<br>(1.34) | 0.043<br>(1.17) |
| *FINANCE* | | | | | | | −0.006<br>(−0.13) | −0.023<br>(−0.49) |
| *MULTI* | | | | | | | 0.006<br>(0.18) | 0.001<br>(0.04) |
| *SALARY* | | | | | | | 0.021<br>(0.65) | 0.025<br>(0.76) |
| *Other control vars.* | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| *Intercept* | −5.212***<br>(−12.14) | −5.125***<br>(−11.98) | −3.581***<br>(−8.60) | −3.522***<br>(−8.51) | −5.115***<br>(−12.69) | −5.051***<br>(−12.58) | −5.097***<br>(−13.33) | −5.044***<br>(−13.22) |
| *INDUSTRY* | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| *YEAR* | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| *N* | 16,573 | 16,573 | 19,425 | 19,425 | 18,989 | 18,989 | 20,017 | 20,017 |
| *No. of firms* | 2622 | 2622 | 2793 | 2793 | 2859 | 2859 | 2865 | 2865 |
| *Pseudo* $R^2$ | 0.152 | 0.159 | 0.083 | 0.090 | 0.153 | 0.160 | 0.152 | 0.159 |

Panel B: Using alternative dependent variables

| | *PREMIUM* | *PREMIUM* | *COVERAGE* | *COVERAGE* |
|---|---|---|---|---|
| Variables | *(1)* | *(2)* | *(3)* | *(4)* |
| *RETURNEE* | 0.073***<br>(4.37) | | 0.086***<br>(4.00) | |
| *RETURNEE_PER* | | 0.512***<br>(4.69) | | 0.686***<br>(4.40) |
| *Control* var. | Yes | Yes | Yes | Yes |
| *INDUSTRY* | Yes | Yes | Yes | Yes |
| *YEAR* | Yes | Yes | Yes | Yes |
| *N* | 18,771 | 18,771 | 18,744 | 18,744 |
| *No. of firms* | 2766 | 2766 | 2763 | 2763 |
| *Adj.* $R^2$ | 0.027 | 0.028 | 0.020 | 0.021 |

significant and not significant for the high and low uncertainty avoidance subsample, respectively.

The findings in Panels A and B of Table 11 imply that ORDs are not all the same. If returnees' overseas experience is derived from high international power distance, low individualism, or low uncertainty avoidance countries, it does not affect their firms' decision to provide D&O insurance. A high interpersonal power distance suggests individuals follow a hierarchy and that ORDs just follow their firms' current system (Hofstede, 2001). If an ORD's experience is from a low individualist country, they have less self-aware behavior. Similarly, a low uncertainty avoidance experience suggests an ORD may not see the benefits of having D&O insurance. Therefore, the ORDs will probably follow their firms' current system, not having D&O insurance. In any of these cases, the ORDs are unlikely to provide D&O insurance.

### 4.5. *Further analysis*

We focused on the impact of ORDs on the demand for D&O insurance. However, two additional issues exist. First, ORDs' foreign experience may result from working or studying abroad (Wen et al., 2020). Second, those insured with D&O insurance are ORDs and overseas return officers (OROs). Besides ORDs, OROs may contribute to the firm's various decisions (Dai et al., 2018), including purchasing D&O insurance.

To examine these issues, we define *RETURNEE_WORK* and *RETURNEE_STUDY* as dummy variables with values of 1 if a firm had at least one ORD having previous experience working and studying overseas and 0 for those without the same. *RETURNEE_PER_WORK* and *RETURNEE_PER_STUDY* are the percentages of ORDs with previous work and study

**Table 11**

The effect of power distance, individualism, and uncertainty avoidance.

Panels A and B of Table 11 present the effects of different national cultures for the impact of ORDs on D&O insurance. We follow Hofstede (1980, 2001) to examine how different national cultures, especially those related to interpersonal power distance, individualism, and uncertainty avoidance, may moderate our baseline findings. We use the following steps: 1) We identify the country origin of each ORD. We then assign the interpersonal power distance score to each firm. If a firm has more than one ORD, we take the median score; 2) Using only firms with at least one ORD, we classify the firms into high vs. low interpersonal power distance sample using the median; 3) We combine the high (low) ORD sample with firms not having any ORDs; 4) We reexamine Eq. (3) with the subsamples in (3); and 5) We repeat the analysis using individualism and uncertainty avoidance score. For brevity, we do not report coefficients of control variables. All *Z*-statistics are reported in parentheses. Definitions of variables are shown in Table 2. ***, **, and * indicate 1%, 5%, and 10% significant, respectively.

Panel A: The effects of power distance and individualism

Dependent var. = *DOLI* (1 for having D&O insurance and 0 otherwise)

| | Power distance | | | | Individualism | | | |
|---|---|---|---|---|---|---|---|---|
| | *High* | *Low* | *High* | *Low* | *High* | *Low* | *High* | *Low* |
| Variables | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| *RETURNEE* | −0.535 | 0.262*** | | | 0.266*** | −0.204 | | |
| | (−1.36) | (8.90) | | | (9.02) | (−1.16) | | |
| *RETURNEE_PER* | | | −4.623 | 1.697*** | | | 1.700*** | −1.469 |
| | | | (−1.31) | (12.78) | | | (12.80) | (−1.03) |
| *Control* var. | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| *Intercept* | −2.810*** | −5.017*** | −2.808*** | −4.966*** | −5.061*** | −2.641*** | −5.023*** | −2.641*** |
| | (−5.35) | (−13.21) | (−5.34) | (−13.12) | (−13.31) | (−5.04) | (−13.25) | (−5.05) |
| *INDUSTRY* | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| *YEAR* | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| *N* | 11,922 | 19,950 | 11,922 | 19,950 | 19,816 | 12,056 | 19,816 | 12,056 |
| *No. of firms* | 2200 | 2857 | 2200 | 2857 | 2844 | 2222 | 2844 | 2222 |
| *Pseudo* $R^2$ | 0.092 | 0.151 | 0.092 | 0.158 | 0.153 | 0.090 | 0.160 | 0.089 |

Panel B: The effects of uncertainty avoidance

| | Dependent var. = *DOLI* (1 for having D&O insurance and 0 otherwise) | | | |
|---|---|---|---|---|
| | High | Low | High | Low |
| Variables | (1) | (2) | (3) | (4) |
| *RETURNEE* | 0.268*** | −0.160 | | |
| | (9.08) | (−1.16) | | |
| *RETURNEE_PER* | | | 1.724*** | −1.311 |
| | | | (12.98) | (−1.46) |
| *Control* var. | Yes | Yes | Yes | Yes |
| *Intercept* | −4.962*** | −2.979*** | −4.906*** | −2.974*** |
| | (−13.03) | (−5.70) | (−12.92) | (−5.69) |
| *INDUSTRY* | Yes | Yes | Yes | Yes |
| *YEAR* | Yes | Yes | Yes | Yes |
| *N* | 19,795 | 12,077 | 19,795 | 12,077 |
| *No. of firms* | 2844 | 2229 | 2844 | 2229 |
| *Pseudo* $R^2$ | 0.150 | 0.095 | 0.157 | 0.096 |

experience. *RETURNEE_OFFICER* is a dummy variable with a value of 1 if a firm has at least one senior executive that has the overseas experience, and *RETURNEE_PER_OFFICE* is the proportion of senior executives having overseas experience. We then use these variables to replace *RETURNEE* or *RETURNEE_PER* in Eq. (1).

We present the findings in Table 12. In columns (1) and (2), the coefficients of *RETURNEE_WORK, RETURNEE_STUDY, RETURNEE_PER_WORK,* and *RETURNEE_PER_STUDY* are positively significant at the 1% level, which suggests that the overseas experience, whether due to work or study, makes no difference in a firm's demand for D&O insurance. In columns (3) and (4), the coefficients of *RETURNEE, RETURNEE_OFFICER, RETURNEE_PER,* and *RETURNEE_PER_OFFICE* continue to be positively significant at the 1% or 5% level. Hence, after accounting for OROs, the impact of ORDs on D&O insurance demand remains intact.[11]

Overall, the results in columns (3) and (4) of Table 12 show that ORDs and OROs positively impact the demand for D&O insurance in both columns. In both columns, the magnitudes of the coefficients of ORDs (*RETURNEE* and *RETURNEE_PER*) are larger than the corresponding coefficients of OROs (*RETURNEE* and *RETURNEE_PER_OFFICER*). Hence, the findings suggest ORDs are more crucial than OROs in influencing a firm's demand for D&O insurance.

## 5. Conclusions

We study the impact of ORDs on firms' demand for D&O insurance. Our findings suggest ORDs increase the demand for D&O insurance. The findings are robust and economically significant. In one model, a firm with at least one ORD had a 29% higher probability of purchasing D&O insurance for the directors. Additional analyses suggest the effect is more salient for firms with high internationalization and those in a high marketization province and for the low interpersonal power distance, high individualism, and uncertainty avoidance culture subsample. Therefore, the attitude toward internationalization, marketization and cultural difference between ORDs and local directors contributes to D&O insurance demand.

Our results suggest a major managerial implication. We show that ORDs have an additional effect of incentivizing a firm's purchase of D&O insurance for its executives and directors. Thus, ORDs help firms evaluate the need to use D&O insurance that may ultimately bring benefits to firms in terms of corporate governance (Chang et al., 2018), risk-taking and financial reporting (Lin et al., 2019), innovation (Wang et al., 2020), and IPO pricing (Kao et al., 2020), among others.

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[11] The decision to acquire D&O insurance requires the approval of the board, not the senior executives. We expect the opinions of the ORDs carry more weight than those of OROs.

**Table 12**
Additional analysis.
Table 12 presents the results using ORDs and overseas returnee officers (OROs) as well as their work and education experience. *RETURNEE_WORK* and *RETURNEE_STUDY* are dummy variables with values of 1 if a firm has at least one ORD having previous work and study overseas experience, respectively, and 0 otherwise. *RETURNEE_PER_WORK* and *RETURNEE_PER_STUDY* are the percentage of ORDs with previous work and study experience. *RETURNEE_OFFICER* is a dummy variable with a value of 1 if a firm has at least one senior executive having overseas experience and *RETURNEE_PER_OFFICE* is the proportion of senior executives having overseas experience. For brevity, we do not report coefficients of control variables. All *Z*-statistics are reported in parentheses. Definitions of variables are shown in Table 2. ***, **, and * indicate 1%, 5%, and 10% significant, respectively.

| | Dependent var. = *DOLI* (1 for having D&O insurance and 0 otherwise) | | | |
|---|---|---|---|---|
| Variables | (1) | (2) | (3) | (4) |
| *RETURNEE_WORK* | 0.267*** | | | |
| | (8.08) | | | |
| *RETURNEE_STUDY* | 0.213*** | | | |
| | (6.93) | | | |
| *RETURNEE_PER_WORK* | | 1.464*** | | |
| | | (7.07) | | |
| *RETURNEE_PER_STUDY* | | 1.406*** | | |
| | | (7.79) | | |
| *RETURNEE* | | | 0.218*** | |
| | | | (7.12) | |
| *RETURNEE_OFFICER* | | | 0.178*** | |
| | | | (4.74) | |
| *RETURNEE_PER* | | | | 1.535*** |
| | | | | (10.14) |
| *RETURNEE_PER_OFFICER* | | | | 0.387** |
| | | | | (2.46) |
| *Control* var. | Yes | Yes | Yes | Yes |
| *Intercept* | −4.783*** | −4.894*** | −4.944*** | −4.976*** |
| | (−12.61) | (−12.92) | (−12.99) | (−13.13) |
| *INDUSTRY* | Yes | Yes | Yes | Yes |
| *YEAR* | Yes | Yes | Yes | Yes |
| *N* | 20,069 | 20,069 | 20,069 | 20,069 |
| *No. of firms* | 2866 | 2866 | 2866 | 2866 |
| *Pseudo* $R^2$ | 0.159 | 0.163 | 0.153 | 0.159 |

Our findings suggest two implications. First, ORDs can bring the best practices overseas for executives and directors. Thus, ORDs enhance a firm's value by bringing in risk-management tools from outside. Second, it is a good public policy for regulators to facilitate international education or exchange programs to promote the overseas experience. Then the returnees can adopt and carry good practices back to accelerate a country's financial development. These returnees facilitate the improvement of corporate governance to introduce D&O insurance.

We have three suggestions for future research. First, our study focused on one country. It would be useful to examine other emerging markets to validate our findings against other countries. Second, we confined our study to D&O insurance. It would be worthwhile to examine other risk-management practices of firms because of ORDs. Last, only 7.2% of firms purchase D&O insurance, indicating a very pronounced asymmetry between the number of zeros and ones (those who do not have or have D&O insurance, respectively). Further research can be extended to implement a Bayesian analysis, such as those of Bermúdez-Morata et al. (2008) to refine the analysis.

## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## Data availability

Data will be made available on request.

## Appendix A. The impact of D&O insurance and oversea returnee director on corporate governance

### A1. The impact of D&O insurance on corporate governance

Although a few studies suggest that D&O insurance is a double-edged sword the Chinese D&O insurance studies generally conclude such insurance benefits Chinese firms (Yuan et al., 2016; Li and Xu, 2020; Wang et al., 2020; Li et al., 2022). We attribute the positive effect of D&O insurance to Chinese firms to two reasons. First, China is an emerging market. Firms generally experience fast growth. D&O insurance allows directors and senior executives to limit their legal exposure in case of bad outcomes and they can make the best decisions on behalf of their firms to accompany the fast growth (Hwang and Kim, 2018). Second, the low penetration of D&O insurance in China suggests that firms evaluate the pros and cons of having such insurance thoroughly. Thus, adverse selection issue of having D&O insurance is less likely. Accordingly, moral hazard problem is less likely (Chang et al., 2018). We expect the corporate governance benefits are larger than the cost of moral hazard related to having D&O insurance.

To validate our conjecture, we study a firm's relationship between agency cost and D&O insurance before testing H1. Specifically, we examine if having D&O insurance enhances the corporate governance level. If the logic of H1 is valid, a firm's agency cost level should decrease after a D&O insurance purchase. However, when a firm has high agency costs, it may be more likely to buy D&O insurance (Zou et al., 2008).

To mitigate the endogeneity issue, we use an instrumental variable (IV) approach to conduct the analysis. We use the natural logarithm of the number of insurance professors plus 1 in the region where a firm is located (*SPECIALIST*) as the IV. The data are obtained from CSMAR. *SPECIALIST* meets the relevancy and exclusiveness conditions of an IV. According to Guiso and Jappelli (2005), purchasing insurance products requires knowledge. Having more insurance professors where a firm is located suggests that the firm is exposed to more insurance knowledge. However, *SPECIALIST* alone does not contribute to a firm's agency cost.

Specifically, we used Eq. (A1) and Eq. (A2) to investigate the impact of having D&O insurance on a firm's corporate governance:

$$DOLI_{i,t} = \alpha_0 + \alpha_1\ SPECIALIST_{j,t} + CONTROL_{i,t} + YEAR + INDUSTRY + \varepsilon_{i,t,} \tag{A1}$$

$$AC_{i,t} = \alpha_0 + \alpha_1\ P\_DOLI_{i,t} + CONTROL_{i,t} + YEAR + INDUSTRY + \varepsilon_{i,t,} \tag{A2}$$

where *P_DOLI* is the predicted value of *DOLI*. *AC* is a firm's agency cost. We considered both types 1 and 2 agency costs. For type 1, it is between shareholders and management. Following Ang et al. (2000) and Zhang et al. (2020), we used abnormal perk expense (*ABNPERK*) and asset turnover (*AC1*) to gauge type 1 agency cost. For type 2, it is between large and minority shareholders. We follow Song and Xin (2017) and use other receivables to total assets (*AC2*) as the metric. *DOLI* is defined in Section 3.2. The control variables in Eq. (A1) and Eq. (A2) include those in Section 3.2. For *ABNPERK*,

$$PERK_{i,t}/SALES_{i,t}(\%), = \alpha_0 + \alpha_1 COMP_{i,t} + \alpha_2 SIZE_{i,t} + \alpha_3 INCOME_{i,t,} + \varepsilon_{i,t,} \tag{A3}$$

Where *PERK* is a firm's travel, entertainment, donation, and fine expenses; *SALES* is a firm's total revenue; *COMP* is the natural logarithm of employee total compensation; *SIZE* is the natural logarithm of a firm's total assets; and *INCOME* is the per capita income of the province where a firm is located. The residuals of Eq. (A3) gauge firms' abnormal management expense, which captures firms' corporate governance level. A large residual (denoted as *ABNPERK*) suggests the corporate governance level is poor. For easy interpretation, we multiply the residuals by 100.

We present the findings of Eq. (A1) and Eq. (A2) in Table A1. The coefficient of *SPECIALIST*, as expected, is positive and significant at the 1% level, suggesting that when a region has more insurance professors, firms are likely to have D&O insurance. The coefficients of *P_DOLI* are negatively significant at the 1% or 5% level using *ABNPERK* and *AC2* as dependent variables in columns (2) and (4), suggesting that when a firm has D&O insurance, its agency cost is lowered. In contrast, the coefficient of *P_DOLI* is positive and significant at the 1% level using *AC1* as the dependent variable. Hence, the asset turnover of a firm with D&O insurance increases. Collectively, the results reported in Table A1 support the logic that having D&O insurance enhances a firm's corporate governance.

### *A2. The impact of oversea returnee director on corporate governance*

We present results to support the corporate governance effect of *RETURNEE* We use an instrumental variable approach to estimate Eqs. (A4) and (A5). The IVs are *TALENT* (the number of young talents in the province (or an autonomous city) where a firm is located) and *CONCESSION* (a dummy variable with a value of 1 if a firm is located in a city with a historical concession in the Qing Dynasty and 0 otherwise).

$$RETURNEE_{\ i,t} = \alpha_0 + \alpha_1 IV_{i,t} + CONTROL_{i,t} + YEAR + INDUSTRY + \varepsilon_{i,t,} \tag{A4}$$

$$AC_{i,t} = \alpha_0 + \alpha_1\ P\_\ RETURNEE_{\ i,t} + CONTROL_{i,t} + YEAR + INDUSTRY + \varepsilon_{i,t,} \tag{A5}$$

where *IV* represents *TALENT* and *CONCESSION; P_ RETURNEE* is the predicted value of *RETURNEE*. The control variables in Eq. (A4) and Eq. (A5) include those in Section 3.2.

We present the findings of Eq. (A5) in Table A2. In Panel A, we use *TALENT* as the instrumental variable while Panel B uses *CONCESSION* as the instrumental variable. In Panels A and B, the coefficients of *P_RETURNEE* and *P_RETURNEE_PER* are negatively significant at the 1% level using *ABNPERK* and *AC2* as dependent variables, suggesting that when a firm has ORDs, its agency cost is lowered. In contrast, the coefficients of *P_RETURNEE* and *P_RETURNEE_PER* are positively significant at the 1% level using *AC1* as the dependent variable. Hence, the asset turnover of a firm with ORDs increases. Collectively, the results reported in Table A2 support that having ORDs enhances a firm's corporate governance.

**Table A1**

The impact directors' and officers' liability (D&O) insurance on agency cost

| Variables | 1st stage | 2nd stage | | |
|---|---|---|---|---|
| | *DOLI* | *ABNPERK* | *AC1* | *AC2* |
| | (1) | (2) | (3) | (4) |
| *SPECIALIST* | 0.014*** | | | |
| | (7.83) | | | |
| *P_DOLI* | | −1.315** | 2.624*** | −0.066*** |
| | | (-2.53) | (6.57) | (-3.72) |
| *SIZE* | 0.034*** | 0.162*** | −0.111*** | 0.002*** |
| | (13.10) | (8.36) | (-7.19) | (3.05) |
| *LEV* | 0.030** | −0.081 | 0.667*** | 0.025*** |
| | (2.26) | (-1.52) | (12.85) | (14.65) |
| *ROA* | −0.137*** | −0.512*** | 1.563*** | −0.040*** |
| | (-3.73) | (-2.94) | (10.92) | (-6.99) |
| *LOSS* | 0.016** | 0.014 | −0.089*** | 0.004*** |
| | (2.22) | (0.48) | (-3.40) | (3.44) |
| *BOARD* | −0.031*** | 0.032 | 0.144*** | −0.005*** |
| | (-2.86) | (0.69) | (3.85) | (-3.26) |
| *DUAL* | −0.008** | 0.087*** | −0.004 | −0.001** |
| | (-2.07) | (4.49) | (-0.32) | (-2.14) |
| *TOP1* | −0.001*** | −0.002** | 0.005*** | −0.000*** |

(*continued on next page*)

**Table A1** (*continued*)

| Variables | 1st stage | 2nd stage | | |
|---|---|---|---|---|
| | *DOLI* | *ABNPERK* | *AC1* | *AC2* |
| | (1) | (2) | (3) | (4) |
| | (-8.02) | (-2.17) | (7.96) | (-7.69) |
| *INSTITUTION* | 0.001*** | −0.000 | −0.001*** | 0.000*** |
| | (9.95) | (-0.25) | (-2.81) | (3.44) |
| *PC* | −0.007** | 0.007 | 0.000 | 0.000 |
| | (-2.00) | (0.50) | (0.03) | (0.19) |
| *ZSCORE* | 0.002*** | 0.012*** | 0.007*** | 0.000*** |
| | (5.34) | (4.90) | (4.34) | (6.19) |
| *LAWRISK* | 0.461*** | 1.676*** | −0.665 | 0.165*** |
| | (4.05) | (3.29) | (-1.54) | (8.79) |
| *CSR* | 0.026*** | 0.008 | −0.068*** | 0.001 |
| | (5.44) | (0.36) | (-3.76) | (1.55) |
| *INVEST* | 0.038 | −0.097 | −0.856*** | −0.001 |
| | (1.22) | (-0.73) | (-8.09) | (-0.34) |
| *DA* | −0.032 | −0.222** | 0.342*** | 0.012*** |
| | (-1.25) | (-2.17) | (3.47) | (3.29) |
| *SOE* | 0.031*** | −0.034 | −0.073*** | −0.001 |
| | (7.36) | (-1.48) | (-3.98) | (-1.47) |
| *Intercept* | −0.687*** | −3.443*** | 2.164*** | −0.010 |
| | (-12.17) | (-8.89) | (7.01) | (-0.74) |
| *INDUSTRY* | Yes | Yes | Yes | Yes |
| *YEAR* | Yes | Yes | Yes | Yes |
| *LM statistics* | 62.138 | | | |
| *F value of First stage* | 61.35 | | | |
| *N* | 20,069 | 20,069 | 20,069 | 20,069 |
| *No. of firms* | 2866 | 2866 | 2866 | 2866 |
| *Adj.* $R^2$ | 0.079 | — | — | — |

Table A1 presents the results for the impact of D&O insurance on a firm's agency cost. We use abnormal perk expense (*ABNPERK*) and asset turnover (*AC1*) to gauge type 1 agency cost. For type 2 agency cost, it is between large and minority shareholders. We follow Song and Xin (2017) to use other receivables to total assets (*AC2*) as the metric. *SPECIALIST* is the natural logarithm of the number of insurance professors in the region where a firm is located plus 1. T-statistics are reported in parentheses. Definitions of variables are shown in Table 2. ***, **, and * indicate 1%, 5%, and 10% significant, respectively.

**Table A2**

The effect of oversea returnee director on a firm's corporate governance

| Panel A : *Instrumental variable* = *TALENT* | | | | | | |
|---|---|---|---|---|---|---|
| Dependent var. = | *ABNPERK* | | *AC1* | | *AC2* | |
| Variables | (1) | (2) | (3) | (4) | (5) | (6) |
| *P_RETURNEE* | −0.561*** | | 0.497*** | | −0.015*** | |
| | (-3.76) | | (5.86) | | (-3.68) | |
| *P_RETURNEE_PER* | | −2.510*** | | 2.225*** | | −0.067*** |
| | | (-3.80) | | (5.98) | | (-3.73) |
| *Control* var. | Yes | Yes | Yes | Yes | Yes | Yes |
| *Intercept* | −3.442*** | −3.145*** | 1.208*** | 0.945*** | 0.011 | 0.019*** |
| | (-12.05) | (-13.81) | (7.66) | (7.48) | (1.30) | (2.81) |
| *INDUSTRY* | Yes | Yes | Yes | Yes | Yes | Yes |
| *YEAR* | Yes | Yes | Yes | Yes | Yes | Yes |
| *N* | 20,069 | 20,069 | 20,069 | 20,069 | 20,069 | 20,069 |
| *No. of firms* | 2866 | 2866 | 2866 | 2866 | 2866 | 2866 |
| Panel B : *Instrumental variable* = *CONCESSION* | | | | | | |
| Dependent var. = | *ABNPERK* | | *AC1* | | *AC2* | |
| Variables | (1) | (2) | (3) | (4) | (5) | (6) |
| *P_RETURNEE* | −0.983*** | | 0.679*** | | −0.013*** | |
| | (-5.55) | | (7.12) | | (-3.02) | |
| *P_RETURNEE_PER* | | −4.830*** | | 3.336*** | | −0.063*** |
| | | (-5.57) | | (7.14) | | (-3.03) |
| *Control* var. | Yes | Yes | Yes | Yes | Yes | Yes |
| *Intercept* | −4.089*** | −3.666*** | 1.486*** | 1.194*** | 0.014* | 0.020*** |
| | (-12.37) | (-13.49) | (8.50) | (8.17) | (1.71) | (2.83) |
| *INDUSTRY* | Yes | Yes | Yes | Yes | Yes | Yes |
| *YEAR* | Yes | Yes | Yes | Yes | Yes | Yes |
| *N* | 20,069 | 20,069 | 20,069 | 20,069 | 20,069 | 20,069 |
| *No. of firms* | 2866 | 2866 | 2866 | 2866 | 2866 | 2866 |

Table A2 presents the results for the impact of oversea returnee director on a firm's agency cost. In Panel A, we use *TALENT* as the instrumental variable while Panel B uses *CONCESSION* as the instrumental variable. We use abnormal perk expense (*ABNPERK*) and asset turnover (*AC1*) to gauge type 1 agency cost. For type 2 agency cost, it is between large and minority shareholders. We follow Song and Xin (2017) to use other receivables to total assets (*AC2*) as the metric. For brevity, we do not report coefficients of control variables. T-statistics are reported in parentheses of columns. Definitions of variables are shown in Table 2. ***, **, and * indicate 1%, 5%, and 10% significant, respectively.

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