

THE DETERMINANTS OF THE PURCHASE OF D&O INSURANCE IN TAIWANESE FIRMS: CORPORATE GOVERNANCE AND MANAGEMENT TURNOVER PERSPECTIVES

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Abstract

Accounting scandals in recent years have exposed that a high risk in business operations and caught the public attention. Thus, the Taiwanese government has strengthened the necessary regulations to protect shareholders' rights, emphasizing breach of trust by managers and irresponsibility by board of directors (BOD). Situations such as class action lawsuits filed by investors against firms for deficiency in disclosures revealed that firms could purchase directors & officers liability insurance (D&O insurance) to reduce and diversify the potential risks that result in severe harms by management and board decisions. Our study also shows that decisions to purchase D&O insurance may influence the decision making process of BOD and high-level management, and it may even impact the likelihood of management turnover.

The purpose of the study is to examine the main determinants that would influence the firm's decision on whether to purchase D&O insurance. From empirical evidence, we find the purchase of D&O insurance is more likely when firms are greater in BOD independence, higher BOD average compensation, with greater high level management turnover, larger in size, and in the electronics industry. On the other hand, firms are less likely to purchase D&O insurance when there are higher frequencies in change of external auditors, greater deviation of ultimate controlling shareholders cash flow rights and equity control rights, and when firms are with greater in BOD directors serving as firm managers. However, no relationship is found for firms' D&O insurance purchase relates to information disclosure transparency, and duality of CEO and BOD chairman.

Keywords: Directors and Officers Liability Insurance (D&O Insurance), Corporate Governance, Management Turnover

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1 Introduction

Corporate governance of public listed firms has been a prominent issue in several countries – most notably the United States - during the last decade. Countries with emerging markets are also experiencing challenges to the managing environment of their firms. As a result of the Asian Financial Crisis (1997-1998) the Taiwanese government has begun to promulgate stronger corporate governance oversight. The responsibility of corporate board of directors (BOD) was targeted in the 2001 “Corporate Law Amendment,” and in 2002, the “Corporate Governance Best Practice Principles for TWSE/GTSM Listed Companies” and “Securities Investor and Future Trader Protection Act” were

implemented. Furthermore, Taiwan’s “Securities and Futures Investor Protection Center” was formed and has been assisting investors with legal subrogation of about \$20 billion Taiwanese dollars (more than \$666 million USD)² through June 2008 (Lin, 2008). In particular, several accounting scandals emerged in Taiwan around 2004, and many cases of provisional seizure occurred involving managers and BOD members. It was common for board members and/or officers to resign or be dismissed in order to avoid potential loss and risk, both personally and

² It is similar to the accounting scandal case under SEC Rule 10b-5, which shareholders can file lawsuits against firms when managers have made a false statement of a material fact or omitted such a fact.

corporately. As a result, it became more common for public firms to purchase director and officer liability insurance (D&O insurance hereafter) as an incentive to attract talented managers and directors.

D&O insurance also has become a common compensating practice for stable BOD members and firm managers, who are taking greater responsibility for enhancing corporate governance. Typical coverage of D&O liability insurance³ includes all members of the BOD, members of the audit committee, the CEO and certain high-level management, and others deemed necessary. Since the D&O insurance coverage reduces personal liability of many wrongful acts, to the extent not indemnified for directors and officers, the decision to purchase D&O insurance is made based on the extent of a firm's risk-taking behavior⁴. Ultimately it also depends upon the decisiveness of the BOD and management.

The purchase of D&O insurance may be for the reasons cited above, not only for Taiwan, but globally, as well. Additionally, extant studies suggest that there are many requests for purchasing supplemental D&O insurance for BOD members and high-level managers for their monitoring role of the company (O'Sullivan, 2002) and for providing better corporate governance (Core, 1997). However, the major reason for D&O insurance purchase may be for firms' corporate insurance policy arrangement. O'Sullivan and Core's sample firms consisted of D&O insurance in the United Kingdom and in Canada, respectively. But due to differences in legal regime (i.e. common law and code law), cultural differences in shareholder rights, as well as management philosophy influenced by Western and Eastern business society, Taiwanese firms may not mirror Western corporate culture. Additionally, the findings of Taiwanese D&O insurance mandatory disclosure studies may provide feedback and guidance on public policy for other countries. Therefore, one objective of this paper is to explore the main determinants of D&O insurance purchase in Taiwanese firms.

³ D&O is a liability insurance payable to the directors and officers of a company, or to the organization(s) itself, to cover damages or defense costs in the event they suffer such losses as a result of a lawsuit for alleged wrongful acts while acting in their capacity as directors and officers for the organization(s).

⁴ According to the 2002, 2003, and 2004 surveys of D&O liability insurance purchasing and claims trends by Towers Perrin (2002, 2003, 2004), the percentage of U.S. and Canadian participants that reported purchasing D&O liability insurance remained high, increasing from 92% in 1998 to 99% in 2004 for U.S. participants and from 84% to 89%, respectively, for Canadians. For both U.S. and Canadian participants that did not have D&O insurance, the high cost was one of the main reasons for not purchasing coverage (Chung and Wynn, 2008).

Extant studies demonstrate the existence of a negative relationship between management turnover and earnings change or stock performance (Weisbach, 1988; Murphy and Zimmerman, 1993; Coughlan and Schmidt, 1985; Warner, 2000). In addition, Mian (2001) indicates that chief financial officers (CFOs) have incentive to engage in earnings management to retain their employment. Thus, the frequency of management turnover involving the CEO/CFO and chairman of board could affect a firm's performance and earnings quality. Also, based on recent empirical findings related to the managerial opportunism argument, having D&O insurance may weaken the effectiveness of shareholder lawsuits, and purchasing D&O as a managerial control device may reduce expected personal legal liability (Core, 1997, 2000; Boyer and Delvaux-Derome, 2002; Chalmers et al., 2002). Therefore, we expect firms are more likely to purchase D&O insurance to reduce the legal liability of possible earnings management lawsuits due to frequent management turnovers.

External auditors have a role in corporate governance also. Most studies show that longer tenure of a firm's auditor result in higher quality audits or financial reporting (Ghosh & Moon, 2005; Myers et al., 2003; Johnson et al., 2002). Myers et al. (2003) also find that the longer the auditor's tenure, the higher the audited firm's discretionary accruals. In order to restrain the firm's earnings management, stock exchanges in Taiwan, including Taiwan Stock Exchange (TSE) and Gre-Tai Securities Market (GTSM; the OTC of the Taiwan securities market), have implemented a mandatory financial statement detailed re-auditing requirement for firms that employed the same external auditor(s) for a consecutive five years beginning from 2003. The purpose of this measure is to ensure the high level of audit quality, in addition to encouraging the public accounting for the engaged auditor rotation within the same CPA firm. Therefore, a negative relationship is expected between purchasing D&O insurance and external auditors' turnover (rotation). To improve governance and information transparency, as of December 31, 2008, TSE requires that listed companies file their D&O insurance information within 15 days of their fiscal year end (Dec 31 for all listed firms in Taiwan). Prior to that, the D&O insurance data in Taiwan was not publicly available. Therefore, the mandatory measure for Taiwanese firms with their disclosure of D&O insurance provides a good policy setting to explore D&O insurance and its relationship with the firm's corporate governance and management turnover.

The purpose of this study is to empirically examine the determinants of Taiwanese firms' purchase of D&O insurance and to explore the relationship between the stability within the organization – such as the management turnover on CEO, CFO, and chairman of BOD –and the firm's D&O insurance purchase. In tandem with the

mentioned, the factors of corporate governance that may affect the firm's likelihood of purchasing D&O insurance will also be studied.

Our paper is different from O'Sullivan (1997) in two aspects. O'Sullivan (1997) examines the firm's purchase of D&O insurance and the monitoring requirements by alternative mechanisms of shareholder's control and includes the board composition, managerial ownership, and large external shareholders' structure. Our focus is on firms' recent managerial turnover and corporate governance as key factors for their decisions to purchase D&O insurance. Many extant studies only conduct the related topic by questionnaire or survey, which may not be a complete reflection of a firm's actual behavior. Our study, to the best of our knowledge, is the first to empirically examine the determinants of firms' decisions on D&O insurance purchase by using a complete sample of Taiwanese firms during 2008-2009. Thus, the paper's contribution to policy makers and investors is to provide a better understanding of the incentives and determinants of firms to purchase D&O insurance. Our study also provides practical implications to help other emerging markets in their understanding of D&O insurance policy implementation, and how it may affect their corporate governance practices.

Our empirical evidence finds that firms in the electronic industry are more likely to purchase D&O insurance, as well as firms with higher management turnover, higher BOD compensation, greater BOD independence, and larger firm size. On the other hand, firms are less likely to purchase D&O insurance when greater in CEO and BOD chairman duality and higher in external auditors' turnover. However, there is no significant association found with the D&O firms and their degrees of transparency of information disclosure.

The remainder of this paper is organized as follows: Section II presents recent literature for review and develops our hypotheses, followed by Section III with research measures and variables. Section IV includes the sample selection and research design and Section V presents our empirical results and analysis. Finally, Section VI concludes with a brief summary and discussion.

2 Literature review and hypotheses development

2.1 The role of D&O insurance

There are two common views for the reasons that firms purchase D&O insurance. One proposes the monitoring hypothesis that D&O insurance is the complement for BOD's monitoring of the firm's operation (Holderness, 1990; O'Sullivan, 1997). D&O insurance also functions as governance role for provisions on coverage limits and deductibles since insurers have been scrutinized (Wynn, 2008).

Holderness (1990) suggests that the purchase of D&O insurance will provide internal incentives in recruiting better outside directors. Bhagat et al. (1987) propose that the pressure and burden from the BOD would be reduced with the purchase of D&O insurance. However, another view point argues that the firm's speculation behavior could increase as a result of purchasing D&O insurance. Chalmers et al. (2002) find that managers in firms with D&O insurance will be more likely to manipulate the newly issued share prices. By showing an inverse relationship, Chalmers et al. (2002) document that managers purchasing D&O insurance will protect themselves from shareholder's lawsuits resulting from share price declines post-IPOs. In other words, the decision to purchase D&O insurance can be driven by managerial opportunism to eliminate possible legal liability in advance. In addition, Boyer and Delvaux-Derome (2002) find that firms with weaker governance are more likely to engage in speculation behavior giving them more room to manipulate. These firms are more likely to purchase D&O insurance. Similarly, Core (2000) also finds that firms are more likely to purchase greater coverage of D&O insurance with a higher premium when they have more inside voting control. This suggests that the firm with weaker governance will be charged higher D&O insurance premiums.

To conclude the above discussion, we find recent studies have supported that the purchase of D&O insurance will increase managerial opportunism either with weak governance or monitoring; thus our study will continue exploring several variables and relationships among governance factors and D&O insurance purchase behavior.

2.2 Agency cost and information asymmetry in D&O firms

The agency theory from Jensen and Meckling (1976) refers to a "separation of ownership and control" that managers may not seek for maximizing firms' wealth due to their own self-interests to benefit shareholders. Firms where shareholder rights are severely restricted are likely to suffer higher agency costs because managers are better able to exploit weak shareholder rights and to place their own private benefits ahead of shareholders' (Jiraporn, 2006). Thus the potential conflict between "agents and principals" arises when managers take unobserved actions in their self-interests, since it is infeasible for shareholders to monitor all managerial actions at a firm. Given that this information asymmetry exists between managers and shareholders, and the agency cost is the expense to sustain an effective agency relationship, therefore agency costs are best reduced by providing appropriate incentives to align the interests of both managers and shareholders (agents and principals). However, D&O insurance is also supported by the BOD as a vehicle to attract talented personnel, thus

the decision to purchase D&O insurance could exist as a significant agency problem. Therefore a firm's decision to purchase D&O insurance for its directors and managers, while possibly reducing the risk taken, may also incite agency conflict.

From the above discussion, our research is interested in governance quality, one way of monitoring a firm in order to protect shareholders' rights, through empirical examination. However, management turnover is another behavior representing how the managers decide to react under the monitoring. That is another factor that our research attempts to incorporate into empirical examination as well.

2.3 Management turnover in D&O firms

The Sarbanes-Oxley Act (SOX) is the first regulation that requires CEOs and CFOs of public firms to certify financial statements, as their positions allow them to have ultimate influence over financial reporting. Therefore resignation, dismissal, or turnover events of high level managers or BOD members are commonly regarded as an alert or signal to investors that something is amiss within the firm.

Prior studies mainly focus on the relationship among earnings management, management turnover, and firm performance. Research findings suggest, after many accounting scandals in recent years, that managers are changed by poor performance and it is more frequently observed. Most studies demonstrate a reverse association for earnings management and management turnover or management turnover for firms with poor stock performance (Weisbach, 1988; Murphy and Zimmerman, 1993; Coughlan and Schmidt, 1985; Warner, 2000; Tsai et al., 2006; Neumann and Voetmann, 2005). Fewer studies, however, focus on the relationship of corporate governance with CEO/CFO turnover. Gilson (1989) examines the mobility of various management levels among financially distressed companies, finding that 52% of firms decided to change their managers due to the pressure from shareholders and debt holders. Hermalin and Weisbach (2007) further report that CEOs are likely to manage firms' earnings to retain their positions and avoid being replaced.

Theories on management turnover

High-level management turnover is commonly attributed to "common-sense theory," "vicious cycle theory," and "ritual scapegoat theory." On the one hand, common-sense theory proposes that high level managers generate positive impacts on the firm. The company's BOD will select the best qualified managers to lead the company by replacing underperforming managers, which results in improved firm performance (Guest, 1962; Murphy and Zimmerman, 1993). On the other hand, "vicious cycle theory" suggests a reverse influence when a firm replaces

inefficient managers. Grusky (1963) argues that usually when a firm takes considerable amount of time in adjusting to new leadership during management turnover, the tension and internal conflict (??) of the changes result in even lower performance. Then, quite possibly, the firm will undergo another management change due to its low performance, and the vicious cycle continues when the firm's stock prices drop again (Beatty and Zajac, 1987; Bendeck and Waller, 1999; Warner et al. 1988; Lubatkin et al., 1989). Lastly, the "ritual scapegoat theory" proposes the non-relevance between firm performance and management turnover. A study from Gamson and Scotch (1964) suggests, since it is a problem of firm structure leading the poor performance, high-level management is merely the scapegoat of the entire situation. Therefore, share prices will not change simply due to the firm's management turnover (Eitzen and Yetman, 1972; McGuire et al., 1998).

However, a mixed empirical result appears based on the intent of management turnover. Mahajan and Lummer (1993) document a positive market reaction with the replacement of high-level managers for poor performance, but the share price drops if the change is made when managers either leave on their own volition or leap to other better positions. Further, studies from Friedman and Singh (1989) and Bendeck and Waller (1999) find a positive market reaction for turnover if the firm was performing poorly prior to change of management, since there is an expectation of improvement with the new management. However, price drops will be caused by investors' concerns if management turnover occurs in a well-performing firm.

Turnover of the CEO, CFO, and Chairman of the BOD

CEO turnover studies find the likelihood for firms which change CEOs is positively associated with the firm's poor performance (Coughlan and Schmidt, 1985; Warner et al. 1988; Weisbach, 1988; Murphy and Zimmerman, 1993). DeAngelo (1988) documents that managers have incentives to manipulate earnings upward to retain their jobs, since the poor earnings are the target during company proxy fights. Chung (1999) examines the relationship among firms' board composition, change of board chairman, and firms' stock prices, and his finding is in support of "vicious cycle theory." Desai et al. (2006) find the likelihood for firms to change CEOs and board chairmen is increased after the occurrence of financial restatements. Day et al. (2006) study firms' management turnover events post financial restatements, and they document that CEO and CFO turnover events are positively related to the likelihood of restatements. Mian (2001) points out the firm's CFO has incentive to manage earnings and retain his/her job. In order to reduce the potential litigation

risk against the firm's earnings manipulations, CFOs have incentive to require or persuade their firms to purchase D&O liability insurance. Of particular note is that this action is more pronounced during the event of management turnover. Chen et al. (2006) find that the occurrence of accounting fraud is higher when there is high board chairman turnover resulting in an unstable structure within the BOD.

Managers' dismissal, retirement, or resignation could all be reasons for management turnover. The specific reason, however, for the occurrence of management turnover is very difficult to observe. James and Soreff (1981) find a firm typically applies another suitable excuse for the change of managers instead of a direct announcement on dismissal of managers. Based on the same argument, our study is not in an attempt to differentiate the reasons of turnover, but take an observable variable, the frequency of management turnover, into account. Similar to Section 302 in Sarbanes-Oxley Act of 2002, the regulation in Taiwan "Corporate Governance Best Practice Principles for TWSE/GTSM Listed Companies" requires that the BOD chairman, CEO, and chief accountant of a public firm certify their financial statements for disclosure accuracy. By adding a firm's turnover of board chairman, CEO, and CFO as proxies, our study examines the relation of high level management turnover and the decision of firms to purchase D&O insurance. The expectation is that the firm with higher turnover of managers is more likely to purchase D&O insurance for mitigating managers' personal liability and reducing future litigation risk.

Thus, our first hypothesis follows:

H1: The likelihood of firms' D&O insurance purchase is positively associated with firms' recent changes of management (management turnover).

2.4 Weak governance in D&O firms

Although there are several characteristics of BOD structure, shareholder's monitoring, and institutional ownership to measure firms' governance quality, our research focus is the monitoring role of D&O insurance. Therefore, we choose the following governance factors to measure these D&O firms' governance quality: change of auditors, duality position of CEO and chairman as well as director and manager, BOD independence, and the deviation of firm's controlling shareholders' interest.

Governance quality: the change of auditors

Regarding external auditor changes among firms, extant studies mostly support the findings that the longer an auditor's tenure, the better audit quality or financial reporting quality (Ghosh and Moon, 2005; Myers et al., 2003; Johnson et al., 2002). Ghosh and Moon (2005) find a positive association exists between the absolute value of discretionary accruals

and auditor tenure, whereas the longer the firm's auditor-client relationship, the lower the firm's audit accruals were during the sample period of 1985-2000. Their evidence concludes that the auditing quality improved with the longer auditor's tenure.

On the contrary, some studies support the opposite proposition and demonstrate that longer auditor tenure could cause lower audit quality (Casterella et al., 2002; Davis et al., 2003; Chi and Huang, 2005). Applying the learning effect and overly familiarity effect, Chi and Huang (2005) use abnormal accruals proxy for audit quality in Taiwan sample firms to examine two types of auditor tenure (the auditor consecutive tenure and the specific consecutive tenure) using the same CPA firm. Their finding supports the longer auditor tenure, the higher audit quality, if tenure is smaller than a five-year period. Their study also finds, however, that audit quality gets lower as the auditor tenure becomes longer when the auditor tenure is greater than five years⁵. Their study concludes that a mandatory auditor rotation is necessary for better audit quality. Furthermore, Ma and Hsieh (2007) find the activity of voluntary rotation on auditors within the CPA firm improves earnings quality of audited firms. Supporting their finding is that the firms' absolute values of abnormal accruals post voluntary rotation are significantly smaller than those before auditor's rotation. A similar evidence from Carey and Sminett (2006) and they find a reverse relation between auditor tenure and their audited firms' financial reporting quality in Australian firms, where the longer the auditor tenure, the weaker quality in firms' financial reporting. Further, the empirical findings from Fan and Wong (2005) are evidence that external auditors perform a corporate governance role in an emerging country.

Following the passage of Sarbanes-Oxley Act for better corporate governance and reporting, Taiwan government and stock exchanges (TSE and GTSM) since 2003, require a firm's financial statements to be re-audited if the public listed firms are audited by the same external auditors for five consecutive years. The re-audit must be performed by an auditor other than the one the firm has been using. A new auditor will help to ensure financial documents are not compromised and also to enhance clients' earnings quality. Since the auditor data used in our study are mostly from non-voluntary rotation, our empirical finding is expected to support that auditor change will improve the earnings quality, and thus result in an inverse relation between the frequency in change of auditors and the firm's purchase of D&O liability insurance.

⁵ Chi and Huang (2005) document that their empirical results are supported by the existence of learning effect for auditor's tenure is shorter than 5 years; however, overly familiarity effect is found if the auditor's tenure is longer than 5 years.

Governance quality: BOD chairman and CEO duality and director managers

Dalton and Kesner (1987) argue that the duality of the CEO and BOD chairman positions would lead the board to be dominated by management and prevent the BOD from monitoring the firm. Patton and Baker (1987) find a firm without separation of monitoring from managing and of duality of CEO and chairman may lead to board lacking of independence, and also weaken board's monitor mechanism. Dechow et al. (1996) conclude that earnings management typically occurs in a firm with duality of the CEO and chairman, with higher insider board members, and without audit committee. Sharma (2004) finds that the likelihood of fraud occurrence is higher for firms with the CEO and chairman duality relationship.

However, another line of research supports that the CEO and chairman duality is able to eliminate the information asymmetry and enhance firm performance (Daily and Dalton, 1993; Rechner and Dalton, 1991). Thus, the direction of impact on chairman and CEO duality is not exclusive. Our study assumes that a firm with duality of the CEO and chairman position will have a mixed effect on firms' incentive to purchase D&O. On the one hand, duality relation could create opportunism, which increases the likelihood of purchasing D&O insurance. On the other hand, the duality also decreases the information asymmetry between management and the board's monitoring. Therefore, we do not have a prediction on the direction of duality on D&O insurance purchase in our study.

Similarly, a firm with BOD members serving as firm managers also lacks governing independence and the ability of the board to monitor. But the higher ratio of BOD members as managers allows the firm to eliminate information asymmetry and to reduce litigation risk, thus producing a less likelihood of purchasing D&O insurance. Therefore, our study does not have a prediction on the direction of manager-director on D&O insurance purchase.

Governance quality: board independence

Since the mid-1990s, the importance of board independence is more of a concern for accounting research. Many prior studies support that firm value increases in the firm with higher board independence (Cotter et al., 1997; Kaplan and Minton, 1994; Coles et al., 1994; Lee et al., 1999). Beasley (1996) finds that the occurrence of fraudulent accounting activities is lower if the firm consists of more independent directors in the board. However, opposition findings are presented from other research arguing that either the board's independence is not positively associated with corporate governance and firm performance (Byrdand and Hichman, 1992; Rosenstein and Wyatt, 1990; Bhagat and Black, 1996), or that more independent BOD members could result in a decrease

of firm profitability (Bhagat and Black, 1996). The rationale is based on the argument that a relatively lower ownership of outside BOD members (independent board) may not incentivize them for putting forth effort and concern for the firm. Since D&O insurance is warranted for directors and officers with business litigation risks, these directors and officers are more likely to engage in risky business practices with D&O insurance in place. With the statutory law system (or civil law system) practiced in Taiwan, the cost of BOD liability is higher than that of a common law system country. In particular, outside directors do not heavily participate in the firm's business operations but share the same level of legal responsibilities; many outside BOD members are treated as a token or a rubber stamp and are not able to perform a monitoring function for checks-and-balances. Thus, our study proposes a hypothesis that a higher BOD independence may result in higher business risk of the firm. With the firm pressured by directors and officers for more self-protection, the firm is more likely to purchase D&O insurance for liability protection and thus we expect a positive association.

Governance quality: the deviation of firm's controlling shareholders' interest

The agency theory from Jensen and Meckling (1976) infers a "separation of ownership and control" that managers may not seek maximizing the firm's profits due to their own self interests. La Porta et al. (1999) find that the share concentration of big firms is increasing in developing countries, and a majority of these firms are governed by ultimate controlling shareholders. The controlling shareholders typically have considerable power over the firm's excess cash flow rights, primarily through the use of pyramids and the participation of management. The higher deviation of controlling ownership interests, the lower the firm value. Shleifer and Vishny (1997) find that when equity ownership of controlling shareholders is greater than their cash flow rights, a negative effect to minority shareholders is found. Classens et al. (2000) document firms in Southeast Asia showing that the higher the cash flow rights, the higher the firm value. In addition, a reverse association is found between the amount of controlling shareholders on the board and firm performance (Yeh et al., 2001). Their study argues that shareholders' interest is consistent with the firm's when the cash flow rights are greater for controlling shareholders. Thus, at the time for maximizing corporate profits, the incentive to hire professional managers for the firm is greater, while controlling shareholders sitting on the board is lower. Based on the above discussion, our study proposes that the higher the deviation of controlling shareholders' cash flow rights from the controlled equity ownership, the weaker the firm's corporate governance. Therefore, the monitoring activity of the

board is weak and may result in manipulating firm performance. With a higher litigation risk from such a firm, we expect a higher likelihood for the firm to purchase D&O insurance. Thus, a negative relationship is expected.

To conclude the above discussion, we derive our second hypotheses as follows:

H2: The likelihood of firms' D&O insurance purchase is negatively associated with firms' recent governance quality.

3 Measures and Variables

The information asymmetry of D&O firms

Truman and Titman (1988) and Dye (1988) derive analytical models to prove the premise that firm's earnings manipulation arises from the information asymmetry between shareholders and managers. Furthermore, Richardson's (2000) empirical study shows that the greater the information asymmetry, the more likely for managers to manage earnings. When the firm's information disclosure is more transparent, managers are concerned about the effects of stock price and management reputation. They are less likely to manipulate earnings, since transparency facilitates the detection of earnings management (Hirst and Hopkins 1998; Maines and McDaniel, 2000). In Taiwan, the Security and Futures Institute began an "information disclosure and transparency ranking system" (IDTRS) to rank public listed firms and to publish annual reports, assisting in for public firms' disclosure and transparency. The higher the firm ranked, along with its score, correlated to a higher level of information transparency. The greater a firm's transparency, in which the agency cost is lower, the less likely a firm will intend to purchase D&O insurance.

The BOD compensation of D&O firms

Main, Bruce, and Buck (1996) collected sample from 60 large British firms during the period of 1981 to 1989 and found that compensation for directors and officers of firms with provided stock option plans had a positive impact on firm performance, compared to compensation from firms with only a basic salary and bonus plan. Rafel and Gispert (2003) examine the relationship between the firm's industry and directors' compensation, and the findings support that the compensation and firm's ROA performance are positively related. However, it is a reverse association with their industry and compensation. Chen and Pong (2008) use the firm's business risk and director's compensation to determine whether a firm will purchase D&O insurance, and their findings show that

business risk, directors' compensation, and D&O insurance are positively associated. However, the higher a firm's director's compensation, the more likely the firm is to purchase D&O insurance. Thus, our study predicts that a positive relationship for D&O insurance and compensation exists.

4 Methodology

Since 2008, Taiwanese government made a requirement for listed firms to disclose their purchase of D&O liability insurance in Taiwan, and thus the D&O insurance data became publically available. We obtained data for firms' D&O insurance purchase, management turnover, corporate governance, and financials from *Taiwan Economic Journal* (TEJ) database in a two-year period spanning 2008 to 2009. Our study collected 1,418 samples initially but eliminated 31 firm-years due to missing other data. The remaining 1,389 firm-year observations consisted of 690 sample firms with D&O insurance (D&O firms), and another 699 without D&O insurance (Non-D&O firms). There appears that approximately 50% of Taiwanese sample firms have purchased D&O insurance for their directors and officers until 2009.

Descriptive statistics

Panel (A) in Table 1 demonstrates the distribution of sample firms by industry, while panel (B) presents the descriptive statistic results for measuring variables. The frequency of management changes demonstrates that an average CFO turnover for the same firm is 0.52 in a three-year period, which is the highest among all management turnovers, with a max of 6 CFO changes (refers to Table 2). The average CEO turnover is 0.44, yet the statistic for its median still remains zero, which implies this average could be skewed by some extreme values. The lowest average turnover is the chair of BOD at 0.29 in a three-year period, however a max is observed with 8 changes of chairmen.

In addition, the average transparent disclosure rating for sample firms' is 2.53 (whereas 1 is the highest, and 5 is the lowest), indicating firms' average level of transparency is just a little greater than their median point of 3.00. The average industry variable (dichotomy on sample firm is from the electronics industry) is 0.49, which implies 49% of the sample firms represent the electronics industry in Taiwan. That is very similar to the distribution of all listed firms in the Taiwan Stock Exchange (There are approximately 48.5 % of listed firms that have been categorized as electronics and technology-related firms per Taiwan Stock Exchange in 2009.).

Table 1. The summary of descriptive statistics of variables

This table in panel (A) presents the distribution of sample firms by industry. Panel (B) summarizes the descriptive statistics of sample variables from this study. Panel (C) demonstrates the results of a t-test from two sample groups of D&O firms and non-D&O firms. All variables are defined in detail in section 3.

Panel (A)

Industry	D&O firms	Non-D&O firms
Automobile	2	8
Biotech and chemical	32	46
Construction/Real estate	13	53
Electronics	475	211
Food	13	25
Machinery	36	66
Plastics and Rubber	22	38
Pulp and Paper	4	10
Steel	16	37
Textile	10	92
Tourist and Trade	6	30
Transportation	17	19
Others (concrete/glass/ceramic, etc)	42	64
subtotal	690	699

Panel (B)

Variable	Mean	Medium	Maximum	Minimum	Std Dev
D&O	0.50	0.00	1.00	0.00	0.50
Auditor_TO	0.28	0.00	4.00	0.00	0.51
Chair_TO	0.29	0.00	8.00	0.00	0.66
CEO_TO	0.44	0.00	4.00	0.00	0.71
CFO_TO	0.52	0.00	6.00	0.00	0.82
Duality	0.28	0.00	1.00	0.00	0.45
IndBOD	0.11	0.00	0.75	0.00	0.16
DirMgt	0.27	0.22	1.00	0.00	0.17
AvgComp	0.80	0.00	33.00	0.00	1.99
Transparency	2.53	3.00	5.00	0.00	1.02
Dev_Share	42.71	34.92	315.01	0.00	36.24
Debt_ratio	0.35	0.34	0.99	0.01	0.17
Size	22.63	22.46	27.45	19.19	1.27
Industry	0.49	0.00	1.00	0.00	0.50

Panel (C)

Variables	Period	Mean	Std Dev	N	Mean Difference	T-statistic	P-value
Debt Ratio	D&O	0.34	0.163	690	-0.021	-2.234	0.026***
	NonDO	0.36	0.179	699			
Size	D&O	0.58	0.803	690	-13.155	-6.877	0.000***
	NonDO	0.61	0.819	699			
Industry-Electronics	D&O	0.69	0.464	690	0.387	15.610	0.000***
	NonDO	0.30	0.459	699			
Auditor_turnover	D&O	0.24	0.467	690	-0.084	-3.104	0.002***
	NonDO	0.32	0.567	699			
Chair_turnover	D&O	0.34	0.733	690	0.103	2.935	0.003***
	NonDO	0.23	0.566	699			
CEO_turnover	D&O	0.51	0.770	690	0.140	3.658	0.000***
	NonDO	0.37	0.648	699			
CFO_turnover	D&O	0.59	0.839	690	0.146	3.353	0.001***
	NonDO	0.44	0.787	699			
Transparency	D&O	2.46	0.922	690	-0.142	-2.587	0.010***
	NonDO	2.61	1.108	699			
AvgComp	D&O	1.02	2.326	690	0.454	4.270	0.000***
	NonDO	0.57	1.566	699			
Duality	D&O	0.26	0.441	690	-0.024	-0.991	0.322
	NonDO	0.29	0.453	699			
Ind_BOD	D&O	0.16	0.165	690	0.092	11.475	0.000***
	NonDO	0.07	0.134	699			
Dev_Share	D&O	36.10	32.95	690	-13.155	-6.877	0.000***
	NonDO	49.26	38.12	699			
DirMgt	D&O	0.25	0.17	690	-3.020	-3.173	0.002***
	NonDO	0.28	0.17	699			

*, **, *** indicate statistical significance at the 10%, 5% and 1% levels, respectively. All of the p-values are reported in two-tailed.

Where:

DO = dummy variable for the firm's purchase of D&O insurance for the firm i and test period t . 1 if purchase, and 0 otherwise.

Auditor_TO = the frequency of auditor turnover within recent 3 years in the same firm i and test period t .

Chair_TO = the frequency of chairman turnover within recent 3 years in the same firm i and test period t .

CEO_TO = the frequency of CEO turnover within recent 3 years in the same firm i and test period t .

CFO_TO = the frequency of CFO turnover within recent 3 years in the same firm i and test period t .

Debt = the debt ratio of a firm. It is computed by total liability divided by total assets for the firm i and test period t .

Size = the size of a firm by computing by natural logarithm of total assets for the firm i and test period t .

Industry = dummy variable for the firm the firm i is in electronics industry during test period t . 1 if in electronics industry, and 0 otherwise.

Where:

Duality = dummy variable for the duality position as CEO and chairman is the same for the firm i and test period t . 1 if the duality exists, and 0 otherwise.

Ind_BOD = the ratio of independent directors in the BOD for the firm i and test period t .

DirMgt = the ratio of directors also serve as managers for the firm i and test period t .

AvgComp = the average compensation of BOD for the firm i and test period t .

Transparency = the degree of a firm's information disclosure transparency. A firm's transparent value is ranked from 1 to 5 whereas 5 is the most transparent.

Dev_Share = the deviation of firm i 's major stockholders control interest test period t .

Debt = the debt ratio of a firm. It is computed by total liability divided by total assets for the firm i and test period t .

As to the statistics for other governance measures, on average 28% of firms have duality of CEO and BOD chairman. Additionally, 11% of firms have independent board members, while the regulation of board independence in Taiwan is not mandatory yet.

To compare the mean values of two groups, we perform a t-test to show that the firm characteristics of non-D&O firms are not similar to those in D&O firms except for Duality ($t = -0.991$). This is reflected in panel (C) of Table 1. As a result, all of the management turnover, including CEO, CFO, and BOD chair, appear to be more common in D&O firms. This may imply these firms have a history of frequent changes on their management team, while the auditor changes of these firms are just the opposite and not as frequent for D&O firms. This univariate result also supports our hypothesis H1 that managers from firms with frequent management changes are more likely to purchase D&O insurance for self-protection to mitigate their own risks. However, other mean values of governance measures, except duality, are significantly different between D&O and non-D&O firms.

$$\text{[Model 1]} \quad DO_{it} = \beta_0 + \beta_1 \text{Chairman}_{it} + \beta_2 \text{CEO}_{it} + \beta_3 \text{CFO}_{it} + \beta_4 \text{Debt}_{it} + \beta_5 \text{Size}_{it} + \beta_6 \text{Industry}_{it} \quad (1)$$

$$\text{[Model 2]} \quad DO_{it} = \beta_0 + \beta_1 \text{Duality}_{it} + \beta_2 \text{IndBOD}_{it} + \beta_3 \text{DirMgt}_{it} + \beta_4 \text{BODComp}_{it} + \beta_5 \text{Transparency}_{it} + \beta_6 \text{ShareDev}_{it} + \beta_7 \text{Debt}_{it} + \beta_8 \text{Size}_{it} + \beta_9 \text{Industry}_{it} \quad (2)$$

$$\text{[Model 3]} \quad DO_{it} = \beta_0 + \beta_1 \text{Chairman}_{it} + \beta_2 \text{CEO}_{it} + \beta_3 \text{CFO}_{it} + \beta_4 \text{Duality}_{it} + \beta_5 \text{IndBOD}_{it} + \beta_6 \text{DirMgt}_{it} + \beta_7 \text{BODComp}_{it} + \beta_8 \text{Transparency}_{it} + \beta_9 \text{ShareDev}_{it} + \beta_{10} \text{Auditor}_{it} + \beta_{11} \text{Debt}_{it} + \beta_{12} \text{Size}_{it} + \beta_{13} \text{Industry}_{it} \quad (3)$$

Where:

DO = dummy variable for the firm's purchase of D&O insurance for the firm i and test period t . 1 if purchase, and 0 otherwise.

Chairman = the frequency of chairman turnover within recent 3 years in the same firm i and test period t .

CEO = the frequency of chairman turnover within recent 3 years in the same firm i and test period t .

CFO = the frequency of chairman turnover within recent 3 years in the same firm i and test period t .

Duality = dummy variable for the duality position as CEO and chairman is the same for the firm i and test period t . 1 if the duality exists, and 0 otherwise.

IndBOD = the ratio of independent directors in the BOD for the firm i and test period t .

DirMgt = the ratio of directors also serve as managers for the firm i and test period t .

BODComp = the average compensation of BOD for the firm i and test period t .

Overall, the D&O insured firms tend to be larger in size (measured by total assets), with less deviation of cash flow rights and controlling shareholders' rights. They also have higher top-level management turnover ratios (Chairman, CEO, and CFO), a higher average BOD compensation, and a higher independent BOD ratio. However, the descriptive result also presents that D&O firms have less on auditor turnover, debt ratio, the transparency of information disclosure, duality of CEO and BOD chairman, and directors serving as managers.

Since our study focuses on whether the sample firm is a D&O insured firm or non-D&O firm, it is an appropriate research design to apply the logistic model with a dichotomous dependent variable. We applied the regress logistic model (1) to above mentioned management turnover variables and regress logistic model (2) to other governance variables, respectively. Lastly, we applied the regress logistic model (3) to a combination of all measures in order to examine the determinants for Taiwanese firms purchasing D&O insurance. Therefore, our regression models are presented as follow:

Transparency = the degree of a firm's information disclosure transparency. A firm's transparent value is ranked from 1 to 5 whereas 5 is the most transparent.

ShareDev = the deviation of firm i 's major stockholders control interest test period t .

Auditor = the frequency of chairman turnover within recent 3 years in the same firm i and test period t .

Debt = the debt ratio of a firm. It is computed by total liability divided by total assets for the firm i and test period t .

Size = the size of a firm by computing by natural logarithm of total assets for the firm i and test period t .

Industry = dummy variable for the firm the firm i is in electronics industry during test period t . 1 if in electronics industry, and 0 otherwise.

5 Empirical results

Table 2 breaks down the frequency of firms' management turnover and their external auditor turnover for D&O firms and non-D&O firms, based

on their changes of BOD chairman, CEO, CFO, and external auditors in a recent three-year period. The result shows the change of chairman frequency is comparatively low, except very frequent turnovers of chairman or CFO occurred in several firms. Turnover of CFO is particularly more frequent than one time in

the three-year period. An average of 21% and 25% of firms, however, appear to have changed auditors' at least once for D&O and non-D&O firms, respectively. This may be due to the mandatory auditor's five-year rotation enforcement by the Taiwanese government.

Table 2. The summary of the frequency of different turnovers for firms

This table summarizes the frequency of turnovers for external auditor, chairman of the BOD, CEO, and CFO in firms with and without D&O insurance for the firm's recent three year period.

Frequency	Auditor turnover			BOD Chair turnover			CEO turnover			CFO turnover		
	D&O	Non-D&O Firms	Total	D&O Firms	Non-D&O Firms	Total	D&O Firms	Non-D&O Firms	Total	D&O Firms	Non-D&O Firms	Total
0	537	500	1037	522	573	1095	429	494	923	401	475	876
1	145	175	320	125	96	221	195	162	357	202	168	370
2	7	23	30	31	25	56	46	35	81	67	39	106
3	0	1	1	7	2	9	16	6	22	12	8	20
4	1	0	1	3	3	6	4	2	6	6	7	13
5				1	0	1				2	1	3
6										0	1	1
7												
8				1	0	1						
Total	690	699	1389	690	699	1389	690	699	1389	690	699	1389

Table 4 demonstrates the empirical results of logistic model (1), which presents the relationship between the firms' management turnover as well as its change of BOD chairman with their D&O liability insurance purchase behavior. The evidence indicates that the frequency of changes in firms' management (include BOD chairman, CEO, and CFO) is positively associated with the firms' purchase of D&O liability insurance (coefficients are 0.207, 0.188, and 0.302, with z-statistics of 2.239, 2.029, and 3.578, respectively). In other words, firms with a higher

turnover ratio have a greater likelihood of purchasing D&O liability insurance. And being conditioned by better corporate governance, these firms are less likely to change management. Conversely, firms at high operational risk with high turnover will attempt to avoid the risk by purchasing D&O insurance. In addition, we also find that if the sample firms are in the electronics industries and larger in size, they are also positively associated significantly with the purchase of D&O liability insurance.

Table 3. The correlation of the variables

This table summarizes the results of the Pearson (upper right) and Spearman (lower left) correlation coefficients for all variables. All variables are defined in detail in section 3.

	DO	Auditor	Chair	CEO	CFO	Dual	Ind	DirMgt	Comp	Trans	DevShare	Debt	Size	Industry
DO	1.00	-0.08***	0.08**	0.10**	0.09***	-0.03	0.29***	-0.08**	0.11	-0.07	-0.18***	-0.06	0.16***	0.39***
Auditor	-0.07***	1.00	0.99***	0.99***	0.99***	-0.03	0.04	-0.08***	-0.05**	0.01	0.01	0.04	-0.03	-0.03
Chair	0.08**	0.06**	1.00	0.99***	0.99***	-0.05	-0.05*	-0.06**	-0.06	-0.16***	-0.07***	-0.01	0.05*	-0.05*
CEO	0.11**	0.08***	0.31***	1.00	0.99***	-0.08***	0.05*	-0.20***	-0.05*	-0.05*	-0.02	0.00	-0.01	0.02
CFO	0.09***	0.08***	0.21***	0.22***	1.00	0.05*	0.05*	-0.12***	-0.07***	-0.07***	-0.01	0.09***	-0.10***	-0.02
Dual	-0.03	-0.04	-0.05**	-0.10***	0.03	1.00	-0.05*	0.28***	-0.10***	0.06**	0.07***	-0.01	-0.11***	0.07**
Ind	0.29***	0.06**	-0.05*	0.07***	0.07**	-0.05*	1.00	-0.17***	-0.00	-0.08***	0.18***	-0.09***	-0.02	0.41***
DirMgt	-0.08**	-0.08***	-0.11***	-0.23***	-0.13***	0.29***	-0.16***	1.00	0.10***	0.04	-0.11***	-0.01	0.03	0.06**
Comp	0.10	-0.04*	-0.07**	-0.03	-0.05**	-0.09***	0.08***	0.01	1.00	-0.05**	-0.13***	-0.01	0.44***	0.03
Trans	-0.07	0.06**	-0.10***	-0.01	-0.04	0.07**	-0.07***	0.04	-0.10***	1.00	-0.01	-0.12***	-0.06**	-0.09***
DevShare	-0.17***	0.03	-0.06**	-0.04	-0.01	0.07***	0.08***	-0.07***	-0.17***	0.09***	1.00	-0.01	-0.26***	-0.12***
Debt	-0.06	0.05**	-0.03	0.01	0.05**	-0.01	-0.09***	-0.00	-0.06**	-0.04	-0.10	1.00	0.16***	-0.14***
Size	0.15***	-0.02	0.05*	-0.01	-0.07**	-0.12***	-0.05**	0.01	0.43***	-0.12***	-0.31***	0.19***	1.00	-0.01
Industry	0.37**	-0.01	-0.02	0.03	-0.01	0.07**	0.42***	0.06**	0.07***	-0.08***	-0.21***	-0.13***	-0.04	1.00

*, **, *** indicate statistical significance at the 10%, 5% and 1% levels, respectively

Table 4. The relationship of firms' D&O insurance purchase and management turnover

This table summarizes the results of the logistic model (1) for testing the management turnover hypothesis. Testing variables are measures of *BOD chairman_turnover*, *CEO_turnover*, and *CFO_turnover*, along with other control variables of *Debt ratio*, *Size*, and *Industry_dummy* where they are defined in detail in section 3.

H1	Logistic Model		
	Dependent variable = DO		
Variable	Prediction	Coefficient	Z statistic (p-value)
Intercept	?	-8.787	-7.692*** (0.000)
Chair_TO	+	0.207	2.239** (0.025)
CEO_TO	+	0.188	2.029** (0.042)
CFO_TO	+	0.302	3.578*** (0.000)
Debt	?	-0.378	-1.049 (0.294)
Size	?	0.340	6.694*** (0.000)
Industry	?	1.736	14.147*** (0.000)
No of obs		1387	
Avg log likelihood		-0.581	
McFadden R ²		0.1610	

*, **, *** indicate statistical significance at the 10%, 5% and 1% levels, respectively. All the p-values are reported in one-tailed if directional prediction, otherwise reported in two-tailed.

Where:

DO = dummy variable for the firm's purchase of D&O insurance for the firm *i* and test period *t*. 1 if purchase, and 0 otherwise.

Chair_TO = the frequency of chairman turnover within recent 3 years in the same firm *i* and test period *t*.

CEO_TO = the frequency of CEO turnover within recent 3 years in the same firm *i* and test period *t*.

CFO_TO = the frequency of CFO turnover within recent 3 years in the same firm *i* and test period *t*.

Debt = the debt ratio of a firm. It is computed by total liability divided by total assets for the firm *i* and test period *t*.

Size = the size of a firm by computing by natural logarithm of total assets for the firm *i* and test period *t*.

Industry = dummy variable for the firm the firm *i* is in electronics industry during test period *t*. 1 if in electronics industry, and 0 otherwise.

Table 5 presents the results of logistic model (2) on corporate governance measures and firms' D&O insurance purchase. We find, that overall, the empirical result is consistent with our expectation that firms with greater occurrence of an independent board, larger firm size and being in the electronics industry are more likely to purchase D&O insurance (coefficients are 3.053, 0.239, and 1.339, with z-statistics of 6.408, 4.033, and 9.821, respectively). However, the governance measures on director serving as manager, the deviation of cash flow and controlling shareholders' rights are both negatively

associated with firms' purchase of D&O insurance (coefficients are -0.016, and -0.012, with z-statistics of -4.531 and -5.580, respectively). It implies that the duality task of being the director and manager may eliminate the information asymmetry within the company, thus reducing the chance of violation on legal liabilities. The result is that firms have a lower need to purchase D&O insurance. In addition, the controlling shareholders' deviation measures the deviation of controlling shareholders' cash flow rights and the shareholders' equity ownership control showing the lower the ratio the poorer the corporate

governance with poor monitoring. Thus, the higher the deviation is, the more likely firms are to purchase D&O insurance. This is consistent with the arguments

of Shleifer and Vishny (1997) that major shareholders may invade the wealth from minority shareholders.

Table 5. The relationship of firms' D&O insurance purchase and corporate governance measures

This table summarizes the results of the logistic model (2) for testing the hypothesis. Testing variables are governance measures of *Duality*, *Independent_BOD*, *Directors_Managers*, *BOD_Compensation*, *Information_Transparency*, *Deviation of Controlled Shareholders* and all other control variables as those found in Table 3 and defined in detail in section 3.

H2	Logistic Model		
	Dependent variable = DO		
Variable	Prediction	Coefficient	Z statistic (p-value)
Intercept	?	-5.242	-3.896*** (0.000)
Duality	?	0.127	0.905 (0.365)
Ind_BOD	+	3.053	6.408*** (0.000)
DirMgt	?	-0.016	-4.531** (0.000)
Avg_Comp	+	0.060	1.061 (0.107)
Transparency	-	-0.050	-0.807 (0.419)
Dev_Share	-	-0.012	-5.580*** (0.000)
Debt	?	-0.202	-0.536 (0.592)
Size	?	0.239	4.033*** (0.000)
Industry	?	1.339	9.821*** (0.000)
No of obs		1,387	
Avg log likelihood		-0.5673	
McFadden R ²		0.1816	

, * indicate statistical significance at the 10%, 5% and 1% levels, respectively. All the p-values are reported in one-tailed if directional prediction, otherwise reported in two-tailed.

Where:

DO = dummy variable for the firm's purchase of D&O insurance for the firm i and test period t . 1 if purchase, and 0 otherwise.

Duality = dummy variable for the duality position as CEO and chairman is the same for the firm i and test period t . 1 if the duality exists, and 0 otherwise.

Ind_BOD = the ratio of independent directors in the BOD for the firm i and test period t .

DirMgt = the ratio of directors also serve as managers for the firm i and test period t .

Avg_Comp = the average compensation of BOD for the firm i and test period t .

Transparency = the degree of a firm's information disclosure transparency. A firm's transparent value is ranked from 1 to 5 whereas 5 is the most transparent.

Dev_Share = the deviation of firm i 's major stockholders control interest test period t .

Debt = the debt ratio of a firm. It is computed by total liability divided by total assets for the firm i and test period t .

Size = the size of a firm by computing by natural logarithm of total assets for the firm i and test period t .

Industry = dummy variable for the firm the firm i is in electronics industry during test period t . 1 if in electronics industry, and 0 otherwise.

Table 6 presents the results from logistic model (3), including both management and auditor turnover and firms' corporate governance measures, showing most of the results in Table 6 are consistent with those from Table 4 and Table 5. For management turnover measures, a positive relationship is evident on chairman turnover and CFO turnover; the significance level, however, is diverted from the result on CEO turnover from 5% in Table 4 to insignificant in Table

6. For corporate governance variables, the finding is very consistent with that of Table 5, where the BOD independence is positively associated with firms' D&O insurance, while two other measures of **dev_share** and **directors_managers** are still negatively related to D&O insurance. The exception is from that the significance level of average BOD compensation has improves from marginal in Table 5 to 10% in Table 6.

Table 6. The relationship of firms' D&O insurance purchase, management turnover, and corporate governance measures

This table summarizes the results of the logistic model (3) for testing the hypotheses. Testing variables are management turnover measures of *Auditor_turnover*, *BOD_chairman_turnover*, *CEO_turnover*, and *CFO_turnover*, and governance measures of *Duality*, *Ind_BOD*, *Dir_Mgt*, *Avg_Com*, *Transparency*, *Dev_Shares* and all other control variables as those found in Table 3 and defined in detail in section 3.

Logistic Model			
Dependent variable = DO			
Variable	Prediction	Coefficient	Z-statistic (p-value)
Intercept	?	-6.028	-4.446*** (0.000)
Auditor_TO	+	-0.565	-4.359*** (0.000)
Chair_TO	+	0.263	2.714*** (0.007)
CEO_TO	+	0.135	1.375 (0.169)
CFO_TO	+	0.279	3.157*** (0.002)
Duality	?	0.108	0.750 (0.453)
Ind_BOD	+	3.040	6.143*** (0.000)
DirMgt	?	-0.014	-3.680*** (0.000)
Avg_Comp	+	0.061	1.647* (0.100)
Transparency	-	-0.004	-0.065 (0.948)
Dev_Share	-	-0.011	-5.274*** (0.000)
Debt	?	-0.167	-0.435 (0.663)
Size	?	0.250	4.198*** (0.000)
Industry	?	1.409	10.098*** (0.000)
No of obs		1,387	
Pr> chi ²		-0.5520	
Pesdo R ²		0.2040	

*, **, *** indicate statistical significance at the 10%, 5% and 1% levels, respectively. All the p-values are reported in one-tailed if directional prediction, otherwise reported in two-tailed.

Where:

DO = dummy variable for the firm's purchase of D&O insurance for the firm i and test period t . 1 if purchase, and 0 otherwise.

Auditor_TO = the frequency of auditor turnover within recent 3 years in the same firm i and test period t .

Chair_TO = the frequency of chairman turnover within recent 3 years in the same firm i and test period t .

CEO_TO = the frequency of CEO turnover within recent 3 years in the same firm i and test period t .

CFO_TO = the frequency of CFO turnover within recent 3 years in the same firm i and test period t .

Duality = dummy variable for the duality position as CEO and chairman is the same for the firm i and test period t . 1 if the duality exists, and 0 otherwise.

Ind_BOD = the ratio of independent directors in the BOD for the firm i and test period t .

DirMgt = the ratio of directors also serve as managers for the firm i and test period t .

BODComp = the average compensation of BOD for the firm i and test period t .

Transparency = the degree of a firm's information disclosure transparency. A firm's transparent value is ranked from 1 to 5 whereas 5 is the most transparent.

Dev_Share = the deviation of firm i 's major stockholders control interest test period t .

Debt = the debt ratio of a firm. It is computed by total liability divided by total assets for the firm i and test period t .

Size = the size of a firm by computing by natural logarithm of total assets for the firm i and test period t .

Industry = dummy variable for the firm the firm i is in electronics industry during test period t . 1 if in electronics industry, and 0 otherwise.

However, a negative association is found between auditor turnover and firms' D&O insurance purchase (coefficient is -0.565 with z-statistics -4.359), supporting the argument that auditor's rotation will enhance the earnings quality. The evidence indicates that firms with less frequent changes of their auditors, and poorer in earnings quality, tend to be more likely to purchase D&O liability insurance. This finding is also consistent with Fan and Wong (2005) that the auditors concurrently perform a corporate governance function in emerging markets, where firms with higher auditor turnover are also weak in corporate governance, and they are more likely to purchase D&O insurance. As above mentioned, we also find that a positive association between D&O firms and their average BOD compensation (coefficient is 0.061 with z-statistics of 1.647). The finding is also supported from Chen and Pang (2008) that a positive relationship exists between the business risk, directors' compensation, and the decision of a firm to purchase D&O insurance. However, our study does not find any significant evidence to support firms' purchase of D&O insurance in relation to firms' duality of CEO and BOD chairman, nor their information disclosure transparency.

6 Discussion and conclusion

This study examines the determinants of Taiwanese firms' decisions on D&O insurance purchase taking into account their management turnover and corporate governance measures. In exploiting firms' disclosure of D&O insurance purchase as a dependent variable, our logistic Model (1) is to individually test the effect from high-level management turnover during the recent three years on firms' purchase of D&O insurance. Similarly, Model (2) is tested for the association of a different degree of firms' corporate governance on their D&O insurance. Lastly, we

consider the comprehensive effect from both types of measures, where Model (3) is to examine a combination of management as well as auditor turnover and corporate governance.

By using 1,387 Taiwanese firms during the years of 2008 and 2009, this study concludes the following major findings. First, the results support our hypothesis indicating that a positive association holds as firms with greater high-level management turnover are more likely to purchase D&O insurance. The result partially supports the agency cost theory that firms' purchase behavior of D&O insurance is for CEO/CFO self-protection to mitigate the firms' potential risks. On the other hand, there is a negative association between D&O firms and their frequency in changes of external auditors. We find that the policy of auditor rotation in Taiwan has improved the audit quality and reduced the corporate risks, thus firms tend to be less likely to purchase D&O insurance.

Second, the research findings partially support our corporate governance hypothesis. The evidence indicates that firms are more likely to purchase D&O insurance with greater in board independence, higher BOD average compensation, larger in size, and in the electronics industry, whereas the factors typically have been characterized as the better governance of firms. However, the measures of greater in BOD directors serving as firm managers, and the greater deviation of ultimate controlling shareholders cash flow rights and equity control ownership, indicating the lack of independence or governance of firms. Thus our empirical result exhibits a negative relation to the purchase of D&O insurance. Additionally, we do not find a significant relationship between firms' D&O insurance with either their degree of information disclosure transparency or their duality of CEO and BOD chairman. Overall, our study is able to present the major determinants for Taiwanese firms'

purchase behavior of D&O insurance, which heavily involve different management turnover and corporate governance measures.

Our study also provides a few implications for the accounting profession. For the firm with a high frequency of top-level management turnover, there is strong incentive to prevent it from engaging in risky business operation, as well as to affect its decision on the purchase of D&O insurance. As to the business practices in Taiwan, the enforced policy of a mandatory auditor turnover is common within the same CPA firm, which in turn, enhances the earnings quality. With a higher earnings quality and a lower risk of audited companies, firms may have less incentive to purchase D&O insurance. However, the firm with frequent auditor rotations could attain a negative reputation while the insurance companies are unable to distinguish whether the auditor rotation is voluntary or a forced change. Such case may result in the firm's D&O insurance being declined for the adverse selection, which causes the reason for its negative association.

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