

**D&O Insurance and SEO Performance:
Does Managerial Opportunism Always Hold?**

Abstract

This paper examines the relationship between abnormal stock performance after seasoned equity offering (SEO) and changes in firm's D&O liability insurance decision. Using D&O insurance coverage information of publicly traded firms in Taiwan from 2008 to 2013, we intend to see if firms' abnormal post-SEO returns explain changes in their D&O insurance coverage beforehand. The low-litigation environment in Taiwan helps to discover whether D&O insurance decision always reveals opportunistic behavior of managers. Both short-term and long-term post-SEO stock performances are examined. In addition, we investigate if the decisions of increasing D&O coverage motivate SEO firms to change their risk-taking behaviors. The effects of D&O insurance on the changes in firm value after SEOs are also examined to see whether firms could be benefited from such behaviors.

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I. Introduction

It is usually believed that investors possess very little information about the future of firms which issue stocks, whether an initial public offering (IPO) or a seasoned equity offering (SEO). The asymmetric information problems always hold between corporations and investors who purchase stocks from them. The directors and officers of these corporations, worrying about their potential liability for their decisions on behalf of the corporations, usually seek for protection of defending lawsuits possibly brought against them personally after the stocks are issued. The directors and officers liability insurance (D&O insurance hereafter) is thus a hot issue for new issues of corporations.

Recent literatures propose that D&O insurance purchase is a proof for opportunistic behaviors of managers that exploit insider information for private benefits. Chlamers et al. (2002) show that firms with poor three-year post-IPO stock price performance are more likely to purchase D&O insurance before they go public, and insurers can also price the unexpected coverage. Lin et al. (2011) also find that acquirers in M&A activities with a higher level of D&O insurance coverage have significantly lower announcement-period abnormal stock returns. However, Hwang and Kim (2014) argue that when business is under a low-litigation environment, such as in a civil law jurisdiction, D&O insurance can benefit firms in terms of reducing the risk-averse behaviors of managers. Without D&O insurance, managers can be overly averse to taking risks due to potential litigation threats. Using the disclosed information from 2002-2008 in Korea, they find that D&O insurance offers managers the incentive to invest in riskier assets and the value of firms purchasing D&O is higher than the value of those without, measured by Tobin's Q.

Do environmental factors make a difference for the incentives of D&O purchase? We know that the litigation events in civil law countries are fewer. Then why corporations in civil law countries still want to buy D&O insurance? Using the information of D&O insurance coverage before and after SEOs from 2008 to 2013 in Taiwan, we intend to examine whether the post-SEO abnormal stock returns are different between firms that increase their D&O purchase and firms that do not. While the short-term and long-term phenomenon for IPOs and SEOs can be quite different (Loughran and Ritter, 1995), we examine both one-year and three-year post-SEO stock performances. We also intend to see if the decision of increasing D&O coverages motivates SEO firms to involve in higher-risk activities afterwards. The impact of changes in D&O insurance coverage on firm value after SEOs will also be examined.

Our paper complements the literatures in the following ways. First, past literatures focus on the association between post-IPO performance and D&O purchase. For example, Chalmers et al. (2002) find that a negative association between the amount of D&O coverage at the IPO and the abnormal stock return of the firm, and Boyer and Stern (2014) show that firms with a higher premium per dollar of D&O insurance coverage subsequently have poor post-IPO stock returns. Seasoned equity offerings have many similarities to IPOs including the transfer of some of the ownership rights in the company from existing to new shareholders (Spiess and Affleck-Graves, 1995). If the association of post-IPO performance and D&O purchase exists, it may as well exist for SEOs. Second, it is a doubt whether D&O insurance decision alleviates or exacerbates the asymmetric information problem for investors under different jurisdiction system. As our data comes from Taiwan, we intend to examine the association between firms' D&O insurance decisions and post-SEO abnormal stock return as well as firm value and in such a low-litigation jurisdiction

environment. Finally, Chalmers et al. (2002) examine the association between the amount of D&O coverage at the IPO and the three-year stock price performance, and Boyer and Stern (2014) investigate how a firm's D&O insurance contract at IPO relates to firms' first year post-IPO performance. While both short-term and long-term underperformance phenomenon of IPOs and SEOs have been widely studied, we believe it is also worth studying the association of SEO and D&O purchase decision both in short-term and in long-term period.

Our paper is organized as follows. Section II reviews the past literatures on D&O insurance and the world development of D&O insurance market. Section III describes the dataset, the methodologies and the variables used in the paper. Section IV discusses the robustness check of our results and Section V concludes and provides the expected results.

II. Directors' and Officers' Insurance: a Primer

2.1 Past Literatures

A few studies have been devoted to the D&O insurance literature, or specifically, the demand for D&O insurance. Core (1997) used data on D&O policies in Canada to examine the determinants of firms' demand for insurance and found that firms with greater litigation risks are more likely to purchase insurance. Baker and Griffith (2007) examined how D&O liability insurers transform the content of corporate and securities law by studying the D&O underwriting process empirically. They showed that insurance underwriters focus on corporate governance in order to price D&O policies. Zou et al. (2008) investigated the demand for D&O insurance of Chinese listed companies, noting that the incidence of seeking D&O insurance is positively related to the extent of controlling minority shareholder incentive conflicts. Their results showed that the announcements of D&O insurance decisions have a negative

wealth effect, and the incidence of the D&O insurance decision is positively related to the proportion of independent directors and several litigation risk proxies. Lin et al. (2013) analyzed the effect of D&O insurance on the spreads charged on bank loans and found that higher levels of D&O insurance coverage are associated with greater risk taking due to aggressive financial reporting.

2.2 The D&O insurance market

The D&O insurance market in the U.S. is the largest one, accounting for about half to two thirds of the total D&O market globally (Allianz Global, 2011). The market in the EU is somewhat restricted by the size of its corporations, its economy, and its litigious society, but it still enjoys an annual growth rate of 7.9% since 2004. The market in Asia has wide diversity due to alternative legal systems, but has been strongly encouraged as the awareness of corporate governance increases. As of the end of 2013, the market share of D&O insurance in the local market was 98% for the U.S. and 60%-70% for regional financial centers in Asia such as Hong Kong and Singapore. In Taiwan, the market grows steadily and the share gets close to the counterparts in Asia in recent years. In our sample period of 2008 to 2013, the D&O insurance market is 49% among all publicly traded firms in 2008 and expands to 60.3% in 2013.

III. Data and Methodology

Data Sources

Our data come from two sources. The first comes from Taiwan Economic Journal (TEJ), which compiles the SEO information and the financial statements of all publicly traded companies listed in the Taiwan stock market. The other comes from Market Observation Post System (MOPS) set up by the Taiwan stock exchange, which provides information on D&O insurance purchase of our sample firms. Both

firms in Taiwan stock exchange (TSE hereafter) and over-the-counter (OTC) market are included. In 2008-2013 sample period, 248 SEOs in TSE market and 135 SEOs in OTC market are included, while the number reduces to 227 and 134 when firms in financial services industries are excluded.

Methodology

Three sets of regression analysis are examined as follows. We first examine a logistic regression to see what factors influence the D&O insurance decision, using post-SEO stock price performance as a proxy for information and other variables such as characteristics of SEOs and corporate governance variables. We then consider two regressions which examine the effect of changes in D&O coverage on 1)the ex post risks and 2)firm values.

Logistic Regressions

The logistic regression specifies what causes firms to increase their D&O insurance coverage before SEOs. Considering more equity offering naturally results in higher propensity of litigation after SEOs, we focus on the change in insurance coverage per unit. We first calculate the amount of insurance coverage per board member (*Cboard*) and define *ID_O* equals one if the variable *Cboard* increases after SEO and equals zero if *Cboard* decreases or is invariant. The *ID_O* variable is then used as the dependent variable in the logistic regression. In order to examine whether the post-SEO abnormal stock returns are different between firms that increase their D&O purchase and firms that do not, the main independent variable is the post-SEO abnormal stock returns. For abnormal returns, we follow Boyer and Stern (2014) and use excess return (*ExReturn*), which is equal to the buy-and-hold return of the firm minus the return on Taiwan's stock market index (TAIEX). One-year and three-year buy-and-hold returns are calculated for short-term and long-term returns, respectively. The abnormal returns using a control sample based on size and book-to-market will

also be used as a robustness check. While literatures such as Chalmers et al. (2002) discover that higher post-IPO excess return explains the higher amount of D&O insurance coverage, the results are based on U.S. data which is under common law regime. We intend to see how post-SEO abnormal return explains the increase in D&O insurance coverage using data in a civil law country. The logistic regression model is shown as follows:

$$\text{Ln}[r_{it} / (1 - r_{it})] = \beta_0 + \beta_1 \text{ExReturn}_{it} + \beta_2' X_{it} + u_{it}. \quad (1)$$

Other than the excess stock return variable, we use a few control variables (expressed as a vector of X_{it}) similar to those in Core (2000) and in Chalmers et al. (2002) that are important in the D&O insurance purchase. We categorize these variables into four groups: *SEO characteristics variables*, *firm financial characteristics variables*, *corporate governance variables* and *other control variables*. The *SEO characteristics variables* include SEO size (*Seosize*) and public offering ratio (*Seoratio*). We measure the effect of size by the log of firm's market value of equity at the time of the SEO. Large firms should be less volatile and requires less for D&O insurance (Boyer and Stern, 2014). The public offering ratio equals to one minus the bookbuilding ratio and the ratio of stocks purchased by employees. It is necessary to control for the public offering ratio as the equity offering purchased by employees or through book-building may overestimate the demand for D&O insurance after SEOs. The *firm financial characteristics variables* include leverage of the firm (*Leverage*) and revenue volatility as proxies for the risk of the firm's business activities. The revenue volatility (*Revstd*) is measured as the standard deviation of average revenues, and an increase in the firm risk may increase the D&O insurance coverage after SEOs. In addition, according to Hwang and Kim (2014), high-growth firms may need more insurance coverage for their business activities, and sales growth (*Growth*) is thus used as the proxy in our analysis.

The *corporate governance variables* can affect the demand for D&O insurance in many ways. Baker and Griffith (2007) and Gillan and Panasian (2010) indicated that good governances could provide close monitoring, while firms with other governance mechanisms might have less incentive to purchase D&O insurance for monitoring purposes (Holderness, 1990). We collect three variables related to governance, including voting right (***Voting***), the proportion of independent directors on the boards (***Ind***), and board size (***Boardsize***). Gupta and Prakash (2012) pointed out that voting right can capture the degree of information asymmetry between the firm and outsiders. Following La Porta et al. (2002), ***Voting*** is defined as the fraction of the firm's voting right owned by its controlling shareholders. Using the data from China, Zou et al. (2008) identified a significant positive relationship between two variables, the proportion of independent directors and the demand for D&O insurance, whereas Boyer and Stern (2012) and Gupta and Prakash (2012) found no significant relationship between these two variables. The relationship of ***Ind*** and the D&O purchase increase thus remains undetermined. The probability of a firm's D&Os being sued might be increased with a higher number of board members. An increase in ***Boardsize*** may induce firms to buy more D&O insurance. Other *control variables* include age of the firm (***Age***), US listed or not (***US_listed***) and firms belonging to electronics industry or not (***Elec***).

The GMM Regressions of Changes in Risks and Firm Value

We consider whether the firm's D&O decision changes its behavior in high-risk activities after SEOs. Following Boyer and Stern (2014), we use Sharpe ratio as the proxy of risk measures, and then calculate the change of risk (***ΔRisk***) that equals to the post-SEO risk measure divided by pre-SEO risk measure. The ***ΔRisk*** variable is calculated within three-month, six-month, and one-year span before and after SEO respectively. The main independent variable is ***ID_O*** variable, a dummy variable that

examines whether the D&O coverage increases after the SEOs. We expect to see a significantly positive coefficient for the *ID_O* variable if firms increasing their D&O coverage do involve in high-risk activities afterwards. To address the likely endogeneity of the independent variables, we employ the Generalized Method of Moments (GMM) estimator with an instrumental variable technique. The GMM does not require distributional assumptions on the error terms, and it is also more efficient than 2SLS because it accounts for heteroskedasticity. The regression model is as follows:

$$\Delta Risk_{it} = \beta_0 + \beta_1 ID_O_{it} + \beta_2 Leverage_{it} + \beta_3 Revstd_{it} + \beta_4 Growth_{it} + \beta_5 Seosize_{it} + \beta_6 ROA_{it} + \beta_7 Elec_{it} + u_{it}. \quad (2)$$

The firm leverage (*Leverage*), volatility of firm revenue (*Revstd*) and sales growth of the firm (*Growth*) are used to proxy for control variables as firm risk. Other than these financial characteristics variables, we also consider *Seosize* to proxy for firm size, and return on assets (*ROA*) as the performance variable of the firm.

We then calculate the change in Tobin's Q to see how firm's D&O decision is related to firm value. Similar to the calculation of *ARisk*, the change of firm value (*ATobinQ*) is used as dependent variable for examining the relationship between firm value and D&O decision change. While past literatures believe that firm risks may increase due to D&O insurance purchase and firms may be harmed by directors' and officers' risky behaviors, Hwang and Kim (2014) argue that D&O insurance in fact encourages managers to involve in beneficial activities such as projects with positive NPVs even these projects are riskier. Our results would be consistent with Hwang and Kim (2014) argument if the coefficient of *ID_O* turns to be significantly positive but would go with literatures of managerial opportunistic behaviors such as Chamlers et al. (2002) more if a negative coefficient is found. The regression models for firm value change are as follows:

$$\Delta TobinQ_{it} = \beta_0 + \beta_1 ID_O_{it} + \beta_2 Leverage_{it} + \beta_3 Revstd_{it} + \beta_4 Growth_{it} + \beta_5 Seosize_{it} + \beta_6 ROA_{it} + \beta_7 Elec_{it} + u_{it}. \quad (3)$$

IV. Preliminary Descriptive Statistics

Table 1 provides part of the descriptive statistics of variables used in the study. The average of the D&O dummy (*D_O*) is 0.6929, implying that approximately 69% of the firms undergoing SEOs in Taiwan purchased D&O liability insurance. This value is higher than the average percentage of the D&O insurance purchased by all publicly traded firms in Taiwan (ranges from 49% to 60% in different sample years) and implies that it is more likely for firms that underwent SEOs to buy D&O insurance. We also find that the average of dummy variable *ID_O* is 0.2302, implying that approximately 23% of the firms increase their insurance coverage before they involve in SEOs. One of our dependent variables, one-year *ExReturn* equals to -0.0024 on average and is consistent with most of the SEO literatures in that the underperformance of the SEO issues is a long-term phenomenon.

[Insert Table 1 Here]

On average, the leverage of the firms on average is 19.87%, 25.98% of firms' voting rights are owned by the controlling shareholders, and 16.96% of the board members are independent directors. In addition, the board size (*Boardsize*) is close to 10 persons on average and the sample firms have an average age of 23.73 years. Among all sample firms, approximately 55% of the sample belongs to the electronics industry, and the profitability measure (*Roa*) is 0.0232 on average.

Table 2 compares the average value of variables between firms that increase the amount of D&O insurance before SEOs and those do not and tests their significance. Our preliminary result shows that the one-year excess return for firms increasing D&O insurance before SEOs is on average -9.83% and is significantly lower than that

for firms not increasing at ten percent level. Before we do further regression analysis, this result may give us a first hint that firms which increase their D&O purchases before SEOs know more insider information than investors.

[Insert Table 2 Here]

For financial variables, we find that firms that increase D&O insurance before SEOs have significantly higher leverage than firms do not, implying that firms with higher risks tend to increase D&O insurance. We also find that for governance variables, firms that increase D&O insurance before SEOs have a higher proportion of independent directors than firms which do not (0.2059 vs. 0.1598). Whether the corporate governance mechanism is complementary with D&O purchase or not will be examined in our further analysis. Finally, firms with increasing D&O insurance tend to be significantly younger firms and significantly better financial performance (measured by *ROA*). Boubakri et al. (2008) state that a high financial performance for a firm could be due to its aggressive earnings management behavior and possibly related to higher risk of the firm. We will also examine the relationship between D&O purchase and firm risks.

V. Robustness Check

In the section above we examine the firm's D&O decision change measured by *ID_O*, a dummy variable that defines increase or not for the amount of insurance coverage. In this section we want to further see that among those firms which increase its D&O coverage after SEOs, whether subsequent stock performance explains the manager's behavior in the purchase of higher amount of D&O coverage beforehand. We use the change in the amount of D&O coverage per board member (*ΔCboard*) as the dependent variable and reexamine model (1). The model is shown as follows:

$$\Delta Cboard_{it} = \beta_0 + \beta_1 ExcessReturn_{it} + \beta_2' X_{it} + u_{it}. \quad (4)$$

In addition, we also want to see among those firms which increase its D&O coverage

after SEOs, whether the change in the amount of D&O coverage per board member affects the change of risk or the change of firm value. The results of D&O insurance coverage amount serve as a robustness check for the impact of D&O insurance decision on firms' behaviors. We expect a significant coefficient for the $\Delta Cboard$ variable if firms increasing their D&O coverage amount do involve in high-risk activities afterwards and have significant change for firm values as well. The regression models are as follows:

$$\Delta Risk_{it} = \beta_0 + \beta_1 \Delta Cboard_{it} + \beta_2 Leverage_{it} + \beta_3 Revstd_{it} + \beta_4 Growth_{it} + \beta_5 Seosize_{it} + \beta_6 ROA_{it} + \beta_7 Elec_{it} + u_{it}. \quad (5)$$

$$\Delta TobinQ_{it} = \beta_0 + \beta_1 \Delta Cboard_{it} + \beta_2 Leverage_{it} + \beta_3 Revstd_{it} + \beta_4 Growth_{it} + \beta_5 Seosize_{it} + \beta_6 ROA_{it} + \beta_7 Elec_{it} + u_{it}. \quad (6)$$

VI. Conclusion

Our paper investigates the relationship between abnormal stock performance after seasoned equity offering (SEO) and changes in firm's D&O liability insurance decision. Using the information of D&O insurance coverage before and after SEOs from 2008 to 2013 in publicly traded firms in Taiwan, we intend to see inside information owned by managers, proxied by the amount of insurance chosen, to be related to the post-SEO performance of the issuing firm's shares. To our knowledge, this is the first paper to examine the association between post-SEO performance and D&O purchase. We first examine a logistic regression and see whether the post-SEO abnormal stock returns, both in short-term and in long-term, matter between firms that increase their D&O purchase and firms that do not. We then consider the effect of changes in D&O coverage on the change of risk-taking as well as on firm values. Our purpose is to see whether the decision of D&O insurance affects the firm positively or

negatively under different jurisdiction system. Our answer could provide information for regulators and insurers whether to encourage the growth of D&O market. Whether D&O insurance decision makes a difference in firm value should also be valuable information to outside investors.

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Table 1: Descriptive Statistics of D&O Purchase and Explanatory Variables

This table provides the descriptive statistics of variables used in the study. The sample period is 2008 to 2013. The sample encompasses 383 firms, and the data are obtained from Taiwan Economic Journal and Market Observation Post System of Taiwan.

Variable	Mean	Median	Maximum	Minimum	Std. Dev.
<i>D_O</i>	0.6929	1.0000	1.0000	0.0000	0.4622
<i>Coverage</i>	208.5226	150.0000	1994.1000	0.0000	225.0759
<i>ID_O</i>	0.2302	0.0000	1.0000	0.0000	0.4225
<i>ExReturn</i>	-0.0024	-0.0886	2.5616	-0.8019	0.4949
<i>TobinQ</i>	1.5123	1.2537	8.9851	0.6239	0.8395
<i>SeoSize</i>	15.3333	15.1515	18.7156	11.5647	1.2910
<i>Leverage</i>	19.8699	14.0803	96.8020	0.0093	23.1010
<i>Voting</i>	0.2598	0.2411	0.7964	0.0134	0.1633
<i>Ind</i>	0.1696	0.2000	0.5000	0.0000	0.1237
<i>Boardsize</i>	9.8450	10.0000	24.0000	6.0000	2.6756
<i>Age</i>	23.7326	22.0000	64.0000	2.0000	13.2149
<i>Elec</i>	0.5465	1.0000	1.0000	0.0000	0.4988
<i>ROA</i>	0.0233	0.0258	0.2462	-0.4991	0.0904
N	380				

Table 2: Average Values and Test Results between Firms Increasing D&O Insurance and Not

This table compares the average value of variables between firms increasing the amount of D&O insurance before SEOs and those not. The sample period is 2008 to 2013. The sample encompasses 383 firms, and the data are obtained from Taiwan Economic Journal and Market Observation Post System of Taiwan.

Variable	ID_O=0	Difference	ID_O=1
<i>ExReturn</i>	0.0145	*	-0.0983
<i>TobinQ</i>	1.4736		1.6553
<i>Seosize</i>	15.2833		15.5181
<i>Leverage</i>	18.6662	*	24.3129
<i>Voting</i>	0.2672		0.2325
<i>Ind</i>	0.1598	***	0.2059
<i>Boardsize</i>	9.6995	*	10.3818
<i>Age</i>	24.6995	**	20.1636
<i>Elec</i>	0.5320		0.6000
<i>ROA</i>	0.0126	***	0.0590
N	307		76

Note: ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.