

DOES MANDATORY DISCLOSURE OF DIRECTORS' AND OFFICERS' LIABILITY INSURANCE CURB MANAGERIAL OPPORTUNISM? EVIDENCE FROM THE CANADIAN SECONDARY MARKET

NARJESS BOUBAKRI* AND NABIL GHALLEB**

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* Department of Finance, HEC Montreal, ** King Fahad University of Petroleum & Minerals. We are grateful to Sandra Betton, Martin boyer, Jean Bédard, Georges Dionne, Hatem Ghouma, and Oumar Sy for helpful comments. Mohamed Jabir provided useful research assistance. Our research has benefited from comments by participants at the 29th McMaster World Congress in Hamilton. Boubakri acknowledges financial support from the SSHRC while Ghaleb acknowledges financial support from CREF and Canada Risk Management Chair. Please address all correspondence to Narjess Boubakri, Department of Finance, HEC Montreal, 3000 Chemin de la Cote-Sainte-Catherine, Montreal (PQ) H3T 2A7, Canada, Email: narjess.boubakri@hec.ca.

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ABSTRACT

We test the managerial opportunism hypothesis in a new context: The purchase of D&O insurance around the time when Canadian firms are getting ready to proceed with their seasoned equity offerings (SEOs). The Canadian context is interesting mainly because the reporting of D&O insurance details is mandatory. We examine whether informed managers modify their behavior regarding the purchase of D&O insurance when their firm are about to sell SEOs. After controlling for other cross-sectional determinants of D&O insurance coverage, we find a significant negative relation between the amount of D&O insurance purchased and subsequent firm performance. This result is surprising because the imposition of a public disclosure is supposed to make the D&O insurance purchases a useless tool for extracting private benefits from private information. As a further test of managerial opportunism, we investigate the premiums paid around the announcement date. If the insurers are able to distinguish managerial opportunism from genuine coverage, they will be able to charge larger insurance premiums on managers that try to cover themselves from the misfortunes of issuing overvalued stocks. The empirical evidence shows that D&O insurers are unable (or do not attempt) to charge more expensive premiums to firms that exploit private information or that abnormally increase their insurance coverage for whatever reason. Finally, we do not find any support to the prediction that lower D&O insurance premiums are associated with good corporate governance quality. One major implication of this essay is that the imposition of a mandatory reporting does not alleviate the opportunistic behavior of managers through the purchase of D&O insurance.

Proponents for a liberal policy of corporate insurance argue that directors' and officers' (hereafter D&O) liability insurance alleviates agency problems by aligning management interests with those of shareholders.¹ However, there is mounting evidence that, by weakening the efficiency of shareholder lawsuits as a managerial control device, D&O insurance favors opportunistic behavior by managers who become more likely to increase their private benefits at the expense of the shareholders.²

The managerial opportunism hypothesis suggests that, in a world of asymmetric information, managers that possess superior information about the firm future performance will have an incentive to issue equity when their firm is overvalued. Chalmers, Dann, and Harford (CDH, 2002) examine whether managers act opportunistically regarding the purchase of D&O insurance around the time of the firm's initial public offerings (IPO). If managers behave opportunistically when issuing overvalued stocks, it is likely that they will try to hedge the individual risk resulting from the exploitation of their private information. Given that lawsuits are typically triggered by unfavorable news in the aftermarket, the likelihood of being sued by unsatisfied shareholders after a sudden plunge in market price is one of the most important costs of issuing overvalued stocks. In such a case, D&O insurance will protect managers against the risk of shareholder litigation. Evidence in CDH (2000) supports the hypothesis that managers behave opportunistically during the IPO process, as the authors find a negative association between the purchase of D&O insurance purchased and post-IPO stock price performance.

¹ According to this view, D&O insurance is important because it can improve the monitoring role of public companies' shareholders by attracting and maintaining competent directors and officers (Priest (1987), Daniels and Hutton (1993), and O'Sullivan (1997, 2002)). D&O insurance can also counter managers' natural tendency to be overly conservative (risk aversion) in managing their firm when they are not enough protected against liability risk (Jensen (1993)). D&O insurers prevent losses by offering an incomplete protection to directors and officers and leave part of the risk to be borne by the corporation, via deductibles and limited coverage (Baker and Griffith (2006)). Finally, litigation can still be an important control device even if all direct costs are paid by an external insurer, if there are reputation costs associated with losing lawsuits (Bhagat, Brickley, and Coles (1987)).

² If insured managers expect greater immunity from liability in suits by shareholders, the potential for lawsuits may do little to discipline them into working in the shareholders' interests (Core (1997, 2000)). Furthermore, if outside directors believe that managers are exempted from liability in suits, they will likely reduce their (unobservable) effort in monitoring their executive colleagues, because of a lower probability to discipline them successfully (Core (1997) and O'Sullivan (2002)). Exposing outside directors to a lower risk level through D&O insurance is also likely to dampen their efforts in monitoring managers.

In this study, we test the managerial opportunism hypothesis in a new context: The purchase of D&O insurance around the time when a firm is getting ready to proceed with its seasoned equity offerings (SEOs). We examine whether informed managers *modify* their behavior with respect to the purchase of D&O insurance when their firm are about to issue SEOs. After controlling for other cross-sectional determinants of D&O insurance coverage, we find a significant negative relation between the amount of D&O insurance purchased and subsequent firm performance. As a further test of managerial opportunism, we examine the premiums paid around the announcement date. Given the structure of their incentives and their unique access to information, one can expect insurers to develop expertise in differentiating good and bad risks and to build these assessments into their models for pricing D&O insurance. In other words, if the insurers are able to distinguish between managerial opportunism and genuine coverage, they will be able to charge larger insurance premiums on managers that try to cover themselves from the misfortunes of issuing overvalued stocks. Because the insurance covers fully their private risk while the cost is spread among all shareholders, managers mismanaging private information will be willing to pay abnormally high premiums. Hence, one can expect a negative relation between D&O insurance premium and private information, proxied by abnormal future performance. Our primary evidence does not support this conjecture and shows that D&O insurers do not (or do not attempt) to charge higher premiums to firms that exploit private information or to those that abnormally increase their insurance coverage for whatever reason. However, when we use a three-stage least squares (3SLS) model to control for the potential simultaneous determination between D&O insurance coverage and premium, we find results that support our expectation of a negative relation between D&O insurance premium and abnormal future performance.

Our work extends the literature in two main directions. (a) Firstly, while the existing studies are based on non-mandatory U.S. information obtained from private sources, this study focuses on Canadian proxy statement data. Because the reporting of D&O insurance details is mandatory in Canada, our sample is free of the sample selection problems associated with non-mandatory data. Moreover, the importance of studying managerial opportunism in a context where disclosure is

mandatory has been highlighted respectively by CDH (2002, p.633) and O’Sullivan (2002, p. 582) in the following terms:

“In the context of D&O liability insurance, it would seem that if managerial opportunism has an impact on the directors’ and officers’ insurance decision, then the merit of mandatory disclosure of directors’ and officers’ liability insurance should be studied further. We note that some countries, such as Canada, have chosen to require full disclosure of these decisions.”

“Future research could also examine the ex-post behavior of insured companies in order to identify whether the purchase of D&O insurance represents any element of managerial opportunism. This work is useful in informing policy deliberations in the UK and elsewhere concerning the need for companies to disclose information on director indemnification provisions.”

One expected benefit of the mandatory reporting of D&O insurance details is its ability to curb any managerial opportunism behavior associated with the purchase of insurance.³ However, even within such a mandatory framework (i.e. the Canadian market), we find that the D&O insurance decision reveals significant managerial opportunism, suggesting that, in fact, mandatory reporting doesn’t fully alleviate managerial opportunism.

(b) Secondly, we test the managerial opportunism in the secondary market (SEO issuances) rather than in the primary market (IPO issuances). We consider that this is a more appropriate exercise because we can examine the managerial behavior change with respect to D&O insurance purchase decisions around the event date—prior to the IPO date, such information on D&O insurance is not publicly. Moreover, since SEO issuers are already followed by analysts, offer public and audited information, have greater market capitalization, and are easier to sell short, it seems

³ CDH (2002) argue that this mandatory disclosure of D&O insurance details is more likely to limit potential managerial opportunism associated with this purchase decision while Griffith (2005) argues that the basic benefit of this disclosure is improvement of capital market efficiency through the signaling effects provided by D&O insurance policy details.

plausible to conjecture that incentives and opportunities to act opportunistically are more limited for SEOs than for IPOs. Thus, any evidence of predictable post-issue returns for SEO issuers based on available D&O insurance information poses an even stronger challenge to the efficient markets theory than the evidence on IPOs. Using univariate tests, we document that managers do significantly change their D&O insurance purchase around the equity offering dates. This suggests that managers time their purchase of insurance to coincide with their equity-offering surge. This makes sense only when there is opportunistic behavior. The relation between D&O insurance and post-issue stock price underperformance has also been documented by CDH (2002) for a sample of IPO firms.

The remainder of this study is organized as follows. Section I describes the basic features of D&O insurance. Section II briefly reviews the literature and develops the main hypotheses. Section III presents the data and summary descriptive statistics. Section IV presents the empirical results, while Section V concludes.

I. Directors' and Officers' Liability Insurance in Canada

In recent years, D&O insurance has grown to become a core component of corporate insurance. This growth has been stimulated by the fact that it has become routine that disgruntled investors accuse corporations and their D&O with securities fraud whenever a firm's stock price declines dramatically and unexpectedly. In this section, we describe and discuss the D&O insurance and the difference between Canada and the U.S.

A typical D&O insurance policy, which is a group policy purchased by the corporation, includes three basic types of coverage: First, a personal coverage protects each individual officer or director against the risk of shareholder litigation. Under this coverage, the insurer will pay covered losses on behalf of managers when the corporation is not able or unwilling to indemnify its managers by reason of law or because of financial distress. Second, a corporate coverage protects the corporation itself against losses incurred from its indemnification commitment to individual

D&O. Third, an entity coverage protects the corporation itself when this latter is a defendant in a shareholder claim.

D&O insurance policies cover losses including damages, judgments, awards, settlements amounts and defense fees incurred in a shareholder claim. Moreover, the insurer covers directors and officers for a claim alleging wrongdoing⁴ in their capacity as D&O, provided they acted honestly and in good faith⁵ and with a view to the best interests of the corporation. Actions qualified as fraudulent, illegal or involving evident conflicts of interest are typically excluded from D&O insurance coverage.⁶ In general, D&O insurance coverage is stated on an annual basis for all covered losses during the policy year. The personal and corporate coverage are usually the same.

The lawsuit risk is the greatest risk facing directors and officers, and has become more acute after the recent corporate scandals, which involved quite reputable firms such as Enron, Health South, Tyco, and World Com in U.S. and Nortel in Canada. For public firms, the dominant source of D&O risk is shareholder litigation. According to Tillinghast-Towers Perrin's (2003) Directors and Officers Liability Survey, about one-half of D&O insurance claims are brought by shareholders in both Canada and the U.S. (the remainder claims are triggered by employees, customers, competitors, regulators, and other third-parties). Several events may trigger lawsuits filing: Illegal acts, violations of security laws, self-dealing, control of the firm, unfair transactions, imprudent or negligent management, bankruptcy, executive compensation, earnings restatement announcement, and improper decision-making process and other self-interested transactions. There is a little cost to filing, and several plaintiffs' attorneys may file a suit. The filing includes an estimate of damages, which is often based on the drop in market price prior to filing.

⁴ A simple definition of a wrongful act given by most professionals would be any error, misstatement, act, omission, neglect, or breach of duty committed, attempted, or allegedly committed or attempted, by an insured, individually or otherwise, in their insured capacity.

⁵ Effort made, information given, or transaction done, honestly and without a deliberate intention to defraud the other party. However, good-faith does not necessarily mean absence of negligence.

⁶ See Baker and Griffith (2007) for a detailed discussion on the principal D&O insurance exclusions.

Our interest in the Canadian data stems for several reasons: First, unlike their counterparts in the U.S., Canadian securities regulators do require disclosure of basic information concerning their D&O insurance policies, including coverage limits and premiums in their proxy filings and registration statements. Therefore, Canada provides us with a natural laboratory to examine issues related to D&O insurance as D&O insurance purchases must be publicly disclosed and are thus supposed to be less contaminated by opportunistic behavior of directors and officers. Second, a major difference between the U.S. and Canada pertains to the legal system: Litigation in the U.S. is considered as a normal business expense by some firms (Kaltchev (2004)) contrary to the Canadian market where litigation is less common. Core (2000) finds that the Canadian legal system is less conducive to nuisance suits over stock price declines, probably because it is a considerably less favorable environment for entrepreneurial plaintiffs' lawyers (Baker and Griffith (2007)).

II. Literature Review and Hypothesis Development

Our study bridges the gap between D&O insurance and managerial opportunism in the secondary market. Both topics have been examined in earlier studies. However, while the literature on managerial opportunism in the equity offering context is large, that on D&O insurance liability is quite limited.

So far, the existing D&O insurance studies focus primarily on the demand of insurance. Core (1997) pioneered the study of the determinants of D&O insurance in Canada by showing that litigation and distress risks are the major determinants of D&O insurance purchases in Canada. O'Sullivan (2002) investigates the determinants of U.K firms' demand for D&O insurance and finds that insured companies are larger, are more exposed to US litigation, experience greater share price variability, exhibit lower levels of managerial ownership, and possess greater non-executive representation on their boards than uninsured companies. Boyer (2003) shows that the lagged insurance purchases is the only determinant that appears to be significant in explaining the insurance decision in Canada, suggesting that habit is the main driver of D&O insurance demand.

Kaltchev (2004) instead argues that market capitalization is the main predictor of D&O insurance coverage purchased by U.S firms. Holderness (1990) takes a corporate governance perspective and shows that directors' and officers' (D&O) insurance has an important governance role in publicly owned companies. Using a sample of U.K firms, O'Sullivan (1997) tests Holderness's monitoring hypothesis by examining the association between board composition, managerial ownership, external shareholder control, and the purchase of D&O. The results generally support the monitoring hypothesis. Fewer studies focused on D&O insurance premiums, and the relation between insurance purchase and firm value. For instance, Core (2000) tests whether D&O insurance premium is commensurate with the firms' corporate governance practices and finds that it does. Bhagat, Brickley, and Coles (1987) examine stock price performance around the announcement of the purchase of D&O insurance, and find no evidence that D&O insurance purchase adversely affects shareholders' wealth. Boyer (2005) provides evidence that D&O insurance protects shareholders' wealth rather than the directors' welfare.

The literature related to managerial opportunism (market timing behavior) in the secondary market is extensive. Indeed, several studies examining the firm's equity offering decision as an alternative way to raise additional financing is based on the hypothesis that there is informational asymmetry between insiders and outside investors regarding the true value of the firm, and posits a decline in stock prices after the SEO. For example, Asquith and Mullins (1986) and Masulis and Korwar (1986) document a significant price drop of the order of 2-3 percent upon the announcement of SEOs. Eckbo and Marsulis (1992) also find an average 3 percent decrease in prices at the SEO announcement dates. This drop is attributed to the investors revising downward their beliefs about the value of the firm's stock. Ritter (1991) argues that managers issue equity when their firms are overvalued, which would explain both the poor post-issue performance, and the concentration of equity issues in periods of high market valuations. More recently, Loughran and Ritter (1995) and Spiess and Affleck-Grave (1995) show that, on average, issuing firms experience substantial and significant stock price underperformance over an extended period of five years following their SEOs. They suggest that it is the revision of investors' optimistic expectations

of future performance that causes the poor long-run performance post-SEO. Loughran, Ritter, and Rydqvist (1994) demonstrate that firms tend to issue at market peaks. Cheng (1994) argues, that overvalued firms have incentives to issue equity even in the absence of good projects reaching the conclusion that firms that do not invest the proceeds may be timing their issues in periods when overpricing is most severe. Bayless and Chaplinsky (1996) investigate whether there is a window of opportunity for equity issuers, and find that offerings indeed cluster when information asymmetry is least severe. Finally, Teoh, Welch, and Wong (1998) and Rangan (1998) examine earnings management in anticipation of SEOs. They find that reported earnings increase abnormally prior to seasoned equity offerings, and show that issuers who alter their discretionary current accruals to report higher net income prior to the offering will actually experience a larger post-issue negative drift.

The only study that bridges the gap between D&O insurance purchases and managerial opportunism in an equity offering context is CDH (2002). Using a sample of 72 U.S. firms, CDH examine the decision of managers to purchase D&O insurance around the time when a firm is preparing to sell its IPO. They hypothesize that—when managers opportunistically exploit their private information—the amount of insurance coverage will be inversely related to the post-offering performance of the issuing firm’s shares. They find a significant negative relation between D&O insurance purchase and long-run future performance, suggesting the presence of managerial opportunism. CDH (2002) also examine the relation between insurance premiums and future performance and find that insurers do not (or are unable) to differentiate between purchasers with depressing private information about the firm prospects and those that purchase extra coverage for other reasons.

However, CDH’s (2002) study is based on privately obtained data, and it is not known whether and how mandatory disclosure would alter the association between D&O insurance purchase and managerial opportunism. As highlighted by CDH, one of the possible effects of the mandatory reporting of D&O insurance details is its potential to limit managerial opportunism associated with

the purchase of insurance, mainly because of the release of private information associated with mandatory reporting. Therefore, it becomes particularly interesting to investigate managerial opportunism in the Canadian context where reporting is mandatory. We hypothesize that post-SEO stock price performance will not be related to the D&O insurance amount purchased.

H.1: The post-SEO stock price performance will not be related to the D&O insurance amount purchased.

Given the structure of their incentives as well as their unique access to information, one can presume insurers will develop the ability to differentiate good and bad risks and to incorporate these assessments into their pricing of D&O insurance.⁷ In other words, if insurers are able to distinguish managerial opportunism from genuine coverage, they will likely charge larger insurance premiums on managers that try to cover themselves from the misfortunes of issuing overvalued stocks. Hence, we hypothesize a negative relation between D&O insurance premium and private information, which we capture with the firm's abnormal future performance.

H.2: The D&O insurance premium is inversely related to the private information measured with the firm's abnormal future performance.

III. Data and Summary Descriptive Statistics

A. Sample Selection

As previously discussed, we focus on Canadian firms because, unlike their U.S. counterparts, they must disclose information regarding their D&O insurance policies, including coverage limits and premiums in their proxy filings and registration statements. We have obtained an initial sample of

⁷ D&O insurers must develop expertise in assessing their potential payment obligations to be able to charge appropriate premiums for their risks because the survival and success of their business depend primarily upon taking in more capital than it pays out. To achieve this purpose, the pricing process of the D&O insurance premium is structured to enable the insurer to obtain cheap and full information about the firm's litigation risk (Holderness (1990) and Knepper and Bailey (1993)).

SEOs from the Securities Data Corporation (SDC) database from January 1997 to December 2003.⁸

We imposed that all issues be Canadian ordinary common stocks; dropped all warrants, unit issues, closed-end funds, right issues, and private placements; excluded financial firms (e.g., Loughran and Ritter (1995));⁹ excluded firms that are not covered by COMPUSTAT at the time of the offering. To avoid statistical problems associated with interdependence of observations, we include only the earliest offering if the sample firm has more than one SEO during the sample period. Applying these requirements, we are left with 249 SEOs from 1997 to 2003.

We merged these 249 SEOs with our D&O insurance liability insurance source of data, the SEDAR online database (www.sedar.com). The D&O insurance data include details on D&O insurance amounts, premiums paid, and corporate deductibles. About 91 SEOs are dropped because we are unable to access to important appropriate documents (proxy statement and/or prospectus). Six SEOs are dropped because their D&O insurance coverage is not disclosed although firm claim the purchase of coverage. One SEO is lost because D&O insurance coverage is given by the firm's parent and eight SEOs are dropped because the premium information is not revealed although details on D&O insurance amount purchased are disclosed. Finally, five SEOs are excluded because the firms state their intention to purchase D&O insurance but finally did not carry it or did not disclose any related details. With these filters, we end up with 138 SEOs, out of which 112 carry D&O insurance (81.2 percent) and 26 SEOs do not.¹⁰

⁸ We start in 1997 because our main source of D&O insurance data (SEDAR) becomes available from this year. SEDAR is an online database that provides access to most public securities documents and information filed by public companies and investment funds with the Canadian Securities Administrators (CSA) in the SEDAR filing system. Our sample period ends in 2003 in order to ensure at least three years of post-SEO returns.

⁹ We remove financials since these firms' incentive to issue equity (for example, banks may issue equity to meet regulatory capital requirements) as well as the applicability of multiple based valuations to these firms are not comparable to other firms. However, following Brav, Geczy, and Gompers (2000) and Eckbo, Masulis, and Norli (2000), we include SEOs of utilities in our sample. Exclusion of utilities from the sample does not change our results materially because the proportion of utilities is very small, less than 3 percent.

¹⁰ We ascertain whether our sample firms carry D&O insurance policy by examining their proxy statements and annual reports. If there is no mention of the existence of D&O insurance policy or no hint that the SEO firm has intention to purchase such policy, we consider the firm as uninsured.

B. Estimation of Private Information

Because shareholder lawsuits can be triggered if the subsequent aftermarket price falls below the offering price, it is important to use a good and realistic long-run performance measure, that typically captures the management' private information. In this study, we choose to use buy-and-hold returns (hereafter BHRs) as a proxy of long run performance.¹¹ BHRs have become standard in measuring long-term abnormal returns (see Barber and Lyon (1997) and Lyon, Barber, and Tsai (1999)). BHRs measure the average multi-year return from a strategy of investing in all firms that complete an event and selling at the end of a pre-specified holding period, versus a comparable strategy using otherwise similar non-event firms. Even though they tend to have a highly skewed distribution, BHRs are better than other proxies as CARs because the return differences are obtainable by a realizable investment strategy, representing the actual wealth effect for an investor in a more realistic way.

Following Loughran and Ritter (1995) and Spiess and Affleck-Graves (1995), we use three-year BHRs to measure long-term performance. In particular, for each issuing firm, we calculate the BHRs by compounding daily returns over either 756 trading days or the number of trading days from the offering date until the delisting date, whichever is smaller. We use the same holding periods and the same procedure to calculate the BHRs of matching firms. Finally, we compute the buy-and-hold abnormal returns (BHARs) as the difference between the SEO firm buy-and-hold return and the portfolio/firm buy-and-hold return. The three-year BHARs for sample firm i are measured using the following formula:

$$BFLAR_i = \prod_{t=\text{first trading day}}^{\min[T, \text{delist}]} (1 + R_{it}) - \prod_{t=\text{first trading day}}^{\min[T, \text{delist}]} (1 + R_{\text{benchmark}t}) \quad (1)$$

¹¹ An alternative method of computing long-run stock price performance is to use cumulated abnormal returns (CARs). The difference between CARs and BHARs is that CARs ignore the effects of compounding returns. While the use of CARs has the advantage of easier statistical tests, it is hard to interpret the results in a practically meaningful way. Following Barber and Lyon (1997) and Kothari and Warner (1997), we do not use CARs in our study.

where $R_{i,t}$ is the return of the sample firm i in day t , $R_{benchmark,t}$ is the return of the benchmark over the same period, T is equal to 756 business days and $delist$ is the delisting date, if any, for the sample SEO firm. Following CDH (2002), we exclude the first day return. Three types of benchmark are used depending on different matching samples strategies: Size, size and book-to-market (B/M), and value-weighted market index.¹²

C. Variable Description

As dependent variables, we use D&O insurance coverage purchased (**coverage**) after the SEO announcement and premium paid (**premium**). All variables are defined in Table II.1. We use three categories of independent variables, namely: Firm characteristics, business risk variables, and corporate governance variables. We control for two issue characteristics: The **offering size** and the **fraction of firm sold**.

[INSERT TABLE II.1 ABOUT HERE]

We follow the literature and rely on five business-risk variable. Because the firm financing policy is likely to affect the demand of corporate insurance, we control for the firm **leverage**. Indeed, since distressed firms tend to exhibit a higher litigation risk and larger bankruptcy costs, leverage is a potential determinant for D&O insurance demand. Therefore, we expect that more leveraged firms are more likely to carry higher limits of D&O insurance and pay higher premiums. Mayers and Smith (1982) argue that it would be optimal for firms that are large, healthy, mature, and unregulated to purchase less insurance, mainly because they have more stable and confident relations with different market participants and are less exposed to litigation risk than young firms. Therefore, we hypothesize that **age** will be inversely proportional to D&O insurance coverage limits and premiums. Since the firm's past performance may be a reliable signal of its future performance, we assume that litigation risk is negatively associated to the firm's past **revenues**.

¹² See Loughran and Ritter (1995) (for size) and Brav and Gompers (1997) (size and B/M).

Consequently, we expect to find a negative association between coverage and premium on the one hand, and the firm's past revenues on the other. Because risky firms are more exposed to litigation risk, we expect a positive relation between **standard deviation of revenues** and D&O insurance coverage and premium.¹³ Since liability risks differ between the U.S. and Canada—because of differences in their respective legal systems—we use information on **U.S. exchange listing** firms to test whether there is a different demand for D&O insurance and premiums in Canada. Canadian firms listed on a U.S. exchange are exposed to a higher litigation risk as shown by Core (1997, 2000), carry higher D&O insurance limits and pay more expensive premiums for insurers. Thus, we expect U.S. exchange listed firms to have a greater demand for D&O insurance and pay higher premiums.

To examine how the governance structure of the firm affects D&O insurance, we rely on four corporate governance variables: (a) Firms with a large **board size** are more likely to purchase higher amounts of D&O insurance and pay higher premiums, as larger boards may increase agency problems (see Yermack (1996)). An alternative hypothesis could be that larger boards may bring together specialists from various functional areas, which will, in turn, increase firm value (Beiner et al. (2006)). Under this alternative hypothesis, firms with large boards will have less need to carry higher D&O insurance coverage limits and to pay higher premiums. The purchase of D&O insurance can improve the monitoring role of public companies' shareholders (e.g. Holderness (1990), Daniel and Hutton (1993), and O'Sullivan (1997)). (b) **Outside directors** can be considered as an alternative monitoring mechanism, we expect the amount of D&O insurance coverage and premium to be negatively related to the number of outside directors. A high **D&O ownership** will work on mitigating the agency problems, and we expect it to alleviate managerial opportunism as well as D&O insurance needs. (c) The percentage of common shares held by **blockholders** can help shareholders to effectively monitor the firm's managers (Schleifer and Vishny (1986)). Hence, we expect firms with blockholders to exhibit less need for D&O insurance. (d) D&O insurance is

¹³ We tested our models using average operating income and standard deviation of operating income instead of average revenue and standard deviation of revenue to find similar results.

often considered as part of the D&O compensation package (Core (1997)) and therefore can be seen as a substitute to alternative forms of directors and officers compensation. Thus, we expect to find a negative association between **executive cash compensation** and D&O insurance.

Finally, we investigate the role of **auditors**. Auditors, being the insurers of the firm's financial statements, mitigate the information asymmetry between inside managers and outside shareholders (Klein (2002)). However, we expect managers of firms having one or more reputable auditors to be exposed to higher litigation risk due to the rigorous monitoring generally conducted by these auditors. Thus, firms with reputable auditors are hypothesized to carry higher D&O insurance coverage because of managers' risk aversion. Therefore, the net effect of this variable on D&O insurance is ambiguous.

D. Summary Descriptive Statistics

Table II.2, Panel A, shows the distribution of our sample 112 SEOs by year. About 48 percent (54 firms) of our SEOs sample of SEOs occurs in the window 1999-2000. The distribution of the sample by industry is shown in Panel B of Table II.2. Industries are identified by the Standard Industrial Classification (SIC) codes provided by COMPUSTAT. Our sample is distributed across 11 industries. More than 50 percent (61 firms) of the sample firms are comprised in three sectors, namely Biotechnology and Pharmaceuticals, Natural resources and Technology, and Mining. Overall, the distribution of our sample across time and industry is consistent with the idea that equity offerings occur in waves (see Lowry (2003), Rajan and Servaes (1997), and Pagano, Panetta, and Zingales (1998)).

[INSERT TABLE II.2 ABOUT HERE]

Table II.3 presents summary descriptive statistics for the variables. Panel A of Table II.3 shows the results for D&O insurance policy characteristics. The post-SEO mean D&O insurance coverage and premium are roughly \$19 million and \$98,000, respectively. The average D&O insurance

coverage purchased is not puny, and represents on average about 87.5 percent of the SEO size. Albeit not reported, the coverage represents about 8.9 percent of the market value of SEOs equity. Interestingly, we record 59 firms (about 52 percent of our sample) that increase their D&O insurance after the SEO. We find that 17 firms (15.3 percent of the sample) purchase a D&O insurance policy for the first time after the SEO event. Our results are comparable with those reported in the 2006 CIBC Director and Officer Liability Insurance Survey. According to the survey, more than half of the firms that carry D&O insurance do so for less than \$20 million coverage, for less than \$150,000 annual premiums, and less than \$250,000 deductibles. The D&O insurance become more costly for firms after SEOs, as the per dollar average cost of D&O insurance coverage increases from 4.5 cents before SEOs to 5.4 cents after SEOs.

Panels B to D of Table II.3 shows the statistics for the other variables. The average age of firms in our sample is 16 years. The average firm size in our sample is about \$377 million, which is substantially larger than the \$20 million observed in CDH's sample of IPOs. Our sample is also characterized by high financial leverage. The median SEO offering size is \$34 million and the median market capitalization is \$278 million. On average, the board is composed of 8.6 members. The average fraction of outside directors is 67.8 percent. On average, directors and officers own 13.5 percent of their firm's total shares outstanding after SEO, while blockholders own about 27.03 percent of the shares. Half of the sample (50.9 percent) has multiple SEOs (returns to the public equity market at least once). About 10 percent of our sample purchases the D&O insurance policy from an U.S. insurer and around 5 percent are listed on one of the U.S. stock exchange markets, namely AMEX, NYSE, or NASDAQ. Finally, about 87 percent of our sample SEOs have one of the big four auditors.

[INSERT TABLE II.3 ABOUT HERE]

IV. Empirical Results

We conduct our empirical analysis as follows. *First*, we estimate the likelihood of carrying a D&O insurance policy using a probit model. *Second*, we perform a univariate analysis to investigate whether managers do significantly change their D&O insurance purchase around the equity offering dates. *Third*, as a more powerful test of managerial opportunism, we perform a multivariate analysis to study the determinants of D&O insurance coverage and premiums paid by SEO firms. *Finally*, we conduct several sensitivity tests to check the robustness of our results.

A. D&O Liability Insurance Purchase Decision and Long-Term Performance

To examine the relation between the post-SEO long-term performance and the likelihood of carrying a D&O insurance policy, we run a probit model where the explanatory variables are regressed on the dichotomous variable taking the value of one for insured firms and zero otherwise. Table II.4 presents the results of probit regressions. The control variables used in these regressions are the same as those we use in the next section to explain the total amount of coverage limit purchased by our sample firms. Four different specifications are estimated: A first specification estimates the basic model (before including the private information proxies) and the three other specifications add a proxy of long-run future performance. We find a strong negative and significant (at the 1 percent level) association between age and the likelihood to carry D&O insurance. This result supports the prediction, *ceteris paribus*, that mature firms exhibit less needs to purchase D&O coverage than young firms. Reported results also show that the fraction sold is negatively and significantly related to the probability to purchase D&O insurance. Unexpectedly, average revenue, and the standard deviation of revenues are statistically significant in most specifications, but do not have the predicted sign. This result suggests that companies experiencing larger revenues (more volatile revenues) are more (less) likely to possess insurance. We have no explanation to this puzzle.

[INSERT TABLE II.4 ABOUT HERE]

The findings obtained for the long-run stock price performance of the SEO firms show a negative association between this performance and the likelihood to carry D&O insurance policy. However, this relation is not statistically significant at conventional levels for all specifications. The limited size of the sample may contribute to the failure of our probit regressions to establish a clear link between the probability to purchase D&O insurance and long-run performance. Nonetheless, we are convinced that the lack of power in our probit model does not significantly weaken the assumption that opportunistic managers are more likely to purchase higher levels of D&O insurance than non-opportunistic ones.

B. Does D&O Liability Insurance Vary around SEO Announcements

One of the advantages of using an SEO sample is that we can track the managerial behavior change with respect to D&O insurance purchase decisions around the event date.¹⁴ In this section, we investigate the evolution of the D&O insurance coverage, premium, and deductible around the SEO date. We compare the means and medians of these variables pre- and post-SEO. Table II.5 shows the results.

The post-SEO mean D&O insurance coverage and premium are \$18.92 million and \$100,822, respectively. These figures represent significant increases (at the 1 percent level of statistical significance) relative to the pre-SEO figures (respectively \$13.93 million and \$75,900). The average corporate deductible significantly (at the 1 percent level) increases from \$95,000 pre-offering to \$141,000 post-offering.

A similar difference between the pre- and post-SEO D&O insurance purchase obtains when we consider the median differences. All Wilcoxon sum-rank tests show that the median differences of coverage limit, premium paid, and corporate deductible around the SEO event are reliably

¹⁴ In contrast, information regarding D&O insurance is not publicly available prior to IPO date.

significant at the 1 percent level. Overall, the results suggest that managers time their purchase of insurance to coincide with their equity-offering surge. This makes sense under the managerial hypothesis, which is the focus of the multivariate tests presented below.

[INSERT TABLE II.5 ABOUT HERE]

C. D&O Insurance Limits and Long-Run Stock Price Performance

As hypothesized above, we expect that the post-SEO stock price performance will not be related to the amount of D&O insurance coverage purchased, since the mandatory reporting of the purchase of D&O insurance is equivalent to a private information release; managers would rather keep their private information secret in order to fully profit from it. However, the univariate results presented above point instead toward the presence of managerial opportunism, as both the D&O insurance coverage and premium significance increases just after the SEO issuance.

In this section, we go beyond the univariate tests, and look at the multivariate determinants of D&O insurance coverage. To control for the determinants of D&O insurance coverage under normal circumstances, we build on Core (2000) and CDH (2002). Specifically, we consider a regression model that combines business risk variables, corporate governance variables, and SEO characteristics, and run the following regression model:

$$Coverage = \alpha_0 + \alpha_1 Risk + \alpha_2 Governance + \alpha_3 Characteristics + e_1 \quad (2)$$

where *Risk* refers to the group of corporate business risk variables: The age of the firm, the firm's financial leverage, average revenues, the standard deviation of average revenues, and U.S. exchange listing dummy; *Governance* stands for the vector of corporate governance variables: Board size, percentage of outside directors on the board, D&O ownership, blockholder, executive cash compensation, and big four auditor dummy; and *Characteristics* is the vector representing our SEO characteristics: SEO offering size and fraction of firm sold.

Table II.6 shows the results from the estimation of the cross-sectional regressions based on equation (2). Four different specifications are estimated: A first specification fit the basic model from (equation (2)) and the three others add each a proxy of private information (long-run future performance). Cross-sectional regression results show that leverage is positively and significantly (almost at the 5 percent level) related to D&O insurance coverage. This result supports the prediction that, *ceteris paribus*, higher leverage is associated with higher default risk. We find also a strong positive and significant at the 1 percent level association between D&O insurance coverage and the U.S. exchange listing dummy, suggesting that the firms listed on U.S. exchange markets carry significantly higher D&O insurance coverage limits than firms listed on Canadian exchange markets. This evidence is in line with our prediction that U.S. exchange listing exposes firms to a greater probability of litigation risk, so much so that concerned managers have a great incentive to purchase more coverage to protect themselves from shareholder lawsuits. Furthermore, firm age, average revenue, and the standard deviation of revenues, although having the predicted sign, aren't distinguishable from zero at conventional levels of statistical significance.

[INSERT TABLE II.6 ABOUT HERE]

Of the corporate governance variables, only executive cash compensation and the big four dummy are robustly and statistically reliable. The positive coefficient on the big-four auditor dummy is consistent with the hypothesis that managers of firms reviewed by reputable auditors are expected to carry higher coverage limits by fear of the rigorous auditing that can potentially create a litigious environment, and cause shareholders lawsuits. The inferred positive relation between executive cash compensation and D&O insurance coverage, however, contrasts with the predictions of the efficient contracting models (e.g. Parry and Parry (1991)), as well as with the idea that D&O insurance can be seen as a substitute to alternative forms of directors and officers compensation.¹⁵ Furthermore, both SEO characteristics, namely offering size and fraction of the

¹⁵ The result is consistent with the assumption that various compensation forms complement each other. Core (1997, p.81) argues that this puzzling result is obtained because the compensation components “*are*

firm sold, are consistently significant at the 5 percent level with the expected signs, suggesting that these characteristics variables are important determinant for D&O insurance coverage.

We obtain some interesting results on the long-run stock price performance of SEO firms, which proxies for private information. For all specifications, we find a negative association between D&O insurance coverage limit and the long-run stock price performance. This result is reliable at the 1 percent level for the size-adjusted BHARs, at the 5 percent level for the market-adjusted BHARs, and at the 1 percent level for the B/M and size-adjusted BHARs.

In unreported results, we follow CDH (2002) by including the standard deviation of daily returns to proxy for the known risk of the firm prior to the SEO. As CDH (2002), we compute the standard deviation of daily returns from day 10 to the end of the first year. This variable can also capture the possibility that riskier SEOs will perform poorly in the future. The evidence shows that, introduced alone or combined with one of our long-run performance proxies, the standard deviation of daily returns fails to exhibit any significant effect on the amount of D&O insurance coverage purchased by SEO firms. Therefore, we conclude that SEO firms exhibit a poor long-run stock price performance not simply because they are riskier SEOs, but because their respective managers were behaving opportunistically when issuing their equity on the market.

The evidence presented above does not support our hypothesis of absence of managerial opportunism for Canadian SEOs. The negative and significant association between the amount of D&O insurance purchased and different proxies of long-run stock price performance implies the presence of managerial opportunism. Therefore, we can conclude that mandatory reporting is not the panacea for the agency problems induced by managers' private information. In other words, the result suggests that available information on the D&O insurance purchase can be used to predict future performance. Accordingly, the fact that managers act opportunistically despite the mandatory reporting of their liability insurance details suggest that either: (a) Markets are inefficient since post-

bundled together by an insider who does not internalize their cost, or because little attention is given to designing director compensation plans? In other words, managerial entrenchment may prevent efficient contracting with outside directors.

SEO performance is predictable based on available D&O insurance information; (b) investors are naïve or irrational because they extrapolate pre-issue earnings to systematically overestimate post-issue earnings and ignore relevant public information contained in D&O insurance details; or (c) obtaining and/or implementing the D&O insurance information are overly costly to the typical investor despite the mandatory reporting. Even if it is not very costly to obtain a firm's D&O insurance information from its financial statements, understanding the implications of this information may be quite costly in terms of time, effort, and other investor resources (see for example Indjejikian (1991)).

D. D&O Liability Insurance Premiums and Unexplained Coverage

In this section, we investigate the relation between D&O insurance premium and future performance of Canadian SEOs. CDH (2002) do not find any significant effect between the premiums paid and future performance. Following Core (2000), we investigate whether insurers can detect managerial opportunism using a two-stage estimation procedure. The rationale behind the use of this estimation method is that the amount of insurance premium is a function of the firm's business risk, its corporate governance, its offering characteristics and its D&O insurance limit purchased.¹⁶ However, as shown by equation (2), the D&O insurance limit is, itself, a function of business risk proxies and corporate governance. To resolve this problem, we first conduct a first-stage regression by estimating equation (2) to obtain the unexplained coverage, which is the error term from the regression. Then, in the second stage, we regress the premiums on a set of independent variables including the residual coverage and the firm's business risk, corporate governance, and SEO characteristics variables. The two-stage regression can be easily understood from the following equations:

$$Premium = \beta_0 + \beta_1 Risk + \beta_2 Governance + \beta_3 Characteristics + \beta_4 Coverage + e_2 \quad (3)$$

¹⁶ We consider the amount of D&O insurance coverage purchased as a determinant of premium. At this stage, we assume that the coverage limit is chosen first, and then the premium is settled following negotiations between the parties of insurance policy.

Substituting coverage in equation (3) by its expression in equation (2), yields

$$Premium = \gamma_0 + \gamma_1 Risk + \gamma_2 Governance + \gamma_3 Characteristics + \gamma_4 e_1 + e_2 \quad (4)$$

where for each $i = 1, 2, 3, 4$, we have $\gamma_i = \beta_i + \beta_4 \alpha_i$ and $\gamma_4 = \beta_4$.

The coefficient γ_i represents the total effect of the independent variables on the premium. Since the independent variables have an impact on both the D&O insurance coverage purchased and the premium paid, we can decompose their total effect on the premium into a direct effect (β_i) and an indirect effect ($\beta_4 \alpha_i$). The coefficient γ_4 captures the effect of unexplained coverage on the premium, making it possible to gauge the extent to which insurers are able to appraise the abnormal insurance demand in their premium pricing process.¹⁷

Table II.7 shows the results for estimating several specifications based on equation (4). In the first specification, we just estimate the equation without any alteration, while in specifications (2) to (4) we use the interactions between the unexplained coverage and the long-run performance proxies. These interaction terms are added to investigate whether insurers can distinguish between insured SEOs that abnormally demand coverage because of negative private information from those following the same behavior for other reasons. If insurers are able to detect opportunist managers, we expect the coefficient on the interaction variables to be negative. Although having the hypothesized sign across all our specifications, neither the unexplained coverage, nor the interaction variables are significantly related to the premium. As found by CDH (2002) for a sample of U.S. IPOs, this result suggest that insurers do not (or do not attempt) to charge more expensive premiums to cover opportunistic managers issuing Canadian SEOs. In contrast to evidence in the

¹⁷ To estimate e_1 , we run equation (2) while taking out all the independent variables that are not known at the time of the SEO.

U.S., D&O insurers do not charge higher premiums even to firms that abnormally increase their D&O insurance purchases for other reasons than opportunism.¹⁸

[INSERT TABLE II.7 ABOUT HERE]

Mindful of the differences between U.S. and Canadian legal systems, we believe that it is difficult to generalize findings from U.S. (CDH (2002)) or any foreign jurisdiction to Canada. Although unexpected, these results can somewhat be rationalized by the arguments discussed below:

(a) It is common knowledge that the Canadian litigation environment is different from the American. In the U.S., litigation is a normal business expense. As a result, insurers have stronger incentives to appraise the shareholder litigation risk accurately for U.S. firms, compared to Canadian firms. Therefore, the smooth nature of the litigation environment in Canada probably causes insurers to underestimate the litigation risk to which Canadian firms are exposed.¹⁹

(b) An alternative explanation is related to market constraints. Insurers are naturally inclined to sell insurance at larger premiums. However, this is not an easy task because of the competitive constraints. If a particular insurer charges more than its market competitors for the same risk, she will lose some market shares. Moreover, according to Tillinghast-Towers Perrin's 2002 Directors and Officers Liability Survey, about 75 percent of our sample firms issued SEO between 1997 and 2000 where the market was "soft" with decreasing premiums, increasing policy limits and deductibles/retentions, and a rise of insurance capacity. The features of such market complicate not

¹⁸ Our results also show a significantly positive (negative) association between SEO size (fraction sold) and premium. Interestingly, we find a negative (positive) relation between average revenues (standard deviation revenues) and coverage premium. Since SEO size and fraction sold were significant determinants of coverage in the first stage (equation (2)), their significant effect on premium in the second-stage is at least coming from their indirect effect on D&O insurance limit. However, average revenues and standard deviation revenues were statistically insignificant in equation (2), hence their significant effect in equation (4) is totally due to their direct effect on premiums paid.

¹⁹ According to Tillinghast-Towers Perrin's 2002 Directors and Officers Liability Survey, only 17 percent of Canadian participants reported one or more claims against their directors or officers over a ten-year experience period. In addition, the 2006 CIBC Director and Officer Liability Insurance Survey indicates that 84 percent Canadian companies do not report an actual claim or threatened claim in the previous three years.

only the insurers' ability to adjust their risk-assessments to arrive at a competitive price, but also to match premiums charged to the risks to be supported. Therefore, market constraints limit the ability of insurers to incorporate all risk factors into the pricing of D&O insurance.²⁰

(c) Unlike their U.S. counterparts, Canadian securities regulators do require disclosure of D&O insurance details. Accordingly, one can plausibly believe—although this study gives opposite evidence—that Canadian insurers may view the public nature of D&O insurance policy as a deterrence device preventing, or at least minimizing, managerial opportunistic behavior via manipulation of D&O insurance purchase (CDH (2002)). Canadian insurers are more likely to be less diligent than U.S. insurers when pricing premium.

However, before advancing any conclusion or implication of this finding at this stage, it makes sense to investigate whether our results are conducted by a potential simultaneity between D&O insurance coverage and premium. The next section treats this issue.

E. Simultaneous Determination of D&O Insurance Limits and Premiums

In this section, we examine the determinants of D&O insurance coverage and premium simultaneously. Boyer (2003, 2005) evokes the possibility that D&O insurance limit and deductible are chosen simultaneously rather than independently. He argues that a risk-averse agent negotiates simultaneously the D&O insurance limit and the deductible at the time of the insurance policy purchase. It is plausible then to look at D&O coverage and premium as dependent rather than independent decisions. Furthermore, these two D&O insurance policy pillars are related also indirectly through their relationship with several control variables. Accordingly, using a standard approach based on a single-equation technique can be misspecified, leading to spurious inferences.

²⁰ See Baker and Griffith (2007) for a detailed discussion on constraints in the insurance market.

To control for this simultaneity relation between D&O insurance coverage and premium, we use a three stage least squares approach (3SLS)²¹ to estimate jointly equation (2) and equation (4).

Panel A, Table II.8, shows the results of estimating the coverage model (equation (2)) using the 3SLS approach. Overall, results are similar to those found using a single-equation OLS model. Panel B of Table II.8, presents the 3SLS results of estimating the D&O insurance premium (equation (4)). Recall that we investigate whether insurers can detect and price managerial opportunism through abnormal coverage purchases. Contrary to the two-stage regression method, we find a reliable significant and positive relation between unexplained coverage and D&O insurance premium. Interestingly, the interaction variables between the unexplained coverage and the long-run performance proxies are negatively and significantly related to the premium in most specifications. This result suggests that insurers do not only pool all types of excess coverage purchasers together, but they are also able to distinguish between firms that purchase abnormal excess coverage by anticipation of poor future long-run performance and firms that purchase extra coverage for some other reason, such as abnormal higher risk aversion by directors and officers.

[INSERT TABLE II.8 ABOUT HERE]

F. Additional Robustness Checks

In this section, we perform a number of additional robustness checks. We investigate the robustness of our results in various contexts. Qian (2005) finds that investors react negatively to the announcement of fast offerings. The author shows that the initiation of another equity offering shortly after a previous one signals to market participants that the firm's management believes their stock is overvalued, and attempts to time the market. We thus test the managerial opportunism hypothesis for firms issuing *multiple* SEOs, and we investigate whether growth firms are subject to managerial opportunism. This hidden agency problem can explain why growth firms experiment

²¹ According to Belsley (1988), the 3SLS possesses greater small-sample efficiency than 2SLS, which also motivates our choice due to the small size of our sample.

post offering stock price underperformance (Lee (1997), Spiess and Afleck-Grave (1995)) and unanticipated deterioration in their earnings' performance following their SEOs (Lee (1997)).

Table II.9, Panel A, presents the results of regressions that test managerial opportunism for the firms issuing multiple SEOs. To do so, we replace in each specification of table II.5 the long-run performance proxy by the product between the long-run performance proxy, and the multiple SEO dummy, which takes 1 if the sample firm issues more than one SEO through the sample period and 0 otherwise. The coefficient associated with the multiple SEO interaction term is negative and significant in most of the specifications, supporting the managerial opportunism hypothesis for firms issuing frequent SEOs.

[INSERT TABLE II.9 ABOUT HERE]

Panel B of Table II.9 show the results of the estimation of the basic model specification (equation (2)) augmented with the interaction terms between the long-run performance proxy and the growth dummy, which takes 1 for firms having their market-to-book ratio is grater than 1 and 0 otherwise. The coefficient associated with this growth interaction term is a negative and significant (at the 5 percent level for two of the five specifications. Taken together, in addition to the fact that all estimated coefficient are consistently negative, our results support the managerial opportunism hypothesis for growth firms.²²

As we discussed above, we are convinced that our general model specification for both coverage limit and premium were chosen to tightfistedly reflect, based on previous literature, the pertinent factors representing firm's business risk as well as its corporate governance quality. Even so, we include numerous other variables in both coverage limit regressions and insurance premiums specifications to ensure that omitted variables are not inducing spurious inference with respect to the independent variables. More specifically, we have considered the average operating income and

²²Because of the multicollinearity problem existing between the BHARs proxies and the interaction terms defined above respectively for multiple SEOs and growth firms, we were not able to examine whether these two sub-samples of firms exhibit a stronger managerial opportunism than the entire sample.

standard deviation of operating income as additional business risk variables; the average years on the board of directors, the percentage of inside directors, D&O indebtedness toward firm and institutional shareholding as further corporate governance factors, and the offer day return (underpricing) as further SEO characteristics.²³ However, none of our results and inferences is materially affected by the inclusion of these variables.

The results are also robust to the inclusion of an alternative private information proxy, namely the market equally-weighted index-adjusted BHARs. As expected, this proxy is negative and significantly related to D&O insurance coverage purchased and premiums paid in almost all regressions. Moreover, its inclusion does not alter our inferences. In addition, we rerun our tests using natural logs in order to mitigate potential heteroskedasticity and the influence of a few extreme observations. However, we find that the premiums paid and the average revenue are negative for some firms. As an additional sensitivity test, we rerun our second-stage regression (equation (4)) without interacting the long-run stock price performance proxies with unexplained coverage. Overall, the results we obtain remain qualitatively the same.

Finally, we test for the bias that can result from using non-randomly selected samples. Using a Heckman selection model to control for this potential bias, we find that our results remain robust. Results are reported in Table II.10.

[INSERT TABLE II.10 ABOUT HERE]

V. Conclusion

This study examines the managerial opportunism hypothesis in the D&O insurance context in Canada. The Canadian context is interesting mainly because the reporting of D&O insurance details is mandatory. Our evidence supports the managerial opportunism hypothesis by showing that the

²³ Although it is an important variable, we do not consider offer day return in our regressions because its inclusion reduces significantly our sample to 88 firms. We define offer day return as the return from the offering price to the end of the first trading day.

amount of D&O insurance is inversely related to the firm's future performance. This result is surprising because the imposition of public disclosure is supposed to make the D&O insurance purchases a useless tool for extracting private benefits from private information. In any case, our results show that the imposition of mandatory reporting is not the panacea for solving the agency problems induced by managers' private information. Moreover, the fact that managers act opportunistically despite the mandatory reporting of their liability insurance details question the semi-strong efficiency of the Canadian markets in reflecting fully the information available to all investors.

Surprisingly, our findings do not support the prediction that insurers can distinguish abnormally large insurance purchases driven by adverse information from those driven by abnormal risk aversion. Indeed, D&O insurers of Canadian CEOs do not (or do not attempt) to charge more expensive premiums to insured firms exploiting private information in their D&O insurance demand, and higher premiums to firms that abnormally increase their D&O insurance purchases for whichever reason. We do not find any support for the prediction that lower D&O insurance premiums are associated with good corporate governance quality.

Our findings have important implications for investors, and regulators. Investors can learn from firms' D&O information to distinguish among issuers quality. For regulators, our evidence provides some further insights on the debate on mandatory disclosure of D&O insurance that is raging in the U.S. In fact, the mandatory disclosure of D&O insurance details in Canada fails to limit potential managerial opportunism associated with the D&O insurance purchase decision. One implication of this result is that if D&O insurance is more likely to have adverse incentive effects that harm shareholders, then both Canadian and U.S regulators need to reconsider the recommendation to limit such practice.

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Table II. 1
Variable Description

This table describes the variables used. Panel A shows the dependent variables; Panel B shows the SEO Characteristic variables; Panel C describes the firm's business risk variables; and Panel D shows the corporate governance variables. Panel E presents the long-term performance measures. For each variable, we define its measurement proxy, and we give the predicted sign of its effect on both D&O insurance limit and premium paid as well as its source of data. All figures are in Canadian dollar.

Variable Name	Definition	Predicted sign/Cov	Predicted sign/Prem	Source of data
Panel A. Dependent Variables				
D&O coverage	Total coverage limits purchased at the end of the SEO fiscal year (\$ millions)		+	SEDAR
Premium	Annual premiums paid by SEO firm to purchase its D&O liability insurance policy (\$ millions)			SEDAR
Panel B. SEO Characteristics				
SEO offering size	Value of SEO (\$ millions)	?	?	SEDAR
Fraction of firm sold	Ratio of SEO shares offered to total outstanding shares after offer	?	?	SEDAR
Panel C. Firm's Business Risk Variables				
Leverage	Total debt divided by the market value of equity plus book value of preferred plus book value of debt	+	+	COMPUSTAT
Age	Number of years of operating history provided in the prospectus	-	-	SEDAR
Revenues	Average reported revenues over three years preceding the SEO announcement date (\$ millions). Partial years are converted to full years by taking the ratio of partial year revenues to prior year partial year revenues and multiplying by the prior full year revenue figure	-	-	SEDAR
Panel C. Firm's Business Risk Variables (continued)				
SD adjusted revenue	Standard deviation of revenues (\$ millions) over three years preceding the SEO announcement date	+	+	SEDAR
U.S. exchange listing	A dummy variable taking 1 if the firm is listed on the U.S. stock market (NYSE, NASDAQ, AMEX) and 0 otherwise	+	+	SEDAR
Market-to-book	The market-to-book ratio of assets	+	+	COMPUSTAT

Table II. 1 - Continued

Variable Name	Definition	Predicted sign/Cov	Predicted sign/Prem	Source of data
Panel D. Corporate Governance Variables				
Board size	Number of members on the board of directors	?	?	SEDAR
Pct. outside directors	Percent of the total number of directors on the board that are outside directors	?	?	SEDAR
Block holder	The cumulative percentage of outstanding shares held by outside holders who own at least 10% of firm shares and who are neither officers nor directors	-	-	SEDAR
Executive cash compensation	The sum of fixed compensation, annual bonuses and ordinary shareholdings for executives	-	-	SEDAR
D&O ownership (%)	Percent of total shares outstanding owned by the directors and officers of the firm	?	?	SEDAR
Big 4 auditor	A dummy variable taking 1 if the firm is audited by a big 4 auditor and 0 otherwise	?	?	SEDAR
Panel E. Long-Run Performance Measures				
3 years BHARs size & BM	Difference between the 3 years buy-and-hold return (BHR) of the SEO firm and the Book-to-Market and size 3 years matched portfolio BHR	-	-	COMPUSTAT
3 years BHARs size	Difference between 3 year BHR of the SEO firm and the 3 year BHR of the size matched firm	-	-	COMPUSTAT
3 years BHARs value wieghted (v.w) market index	Difference between 3 y return of the SEO firm and the three-year BHR of the v. w market index.	-	-	COMPUSTAT

Table II. 2**Frequency Distribution of Seasoned Equity Issues by Year and Industry**

This table presents the distribution of our sample of 112 insured SEOs and 26 uninsured SEOs by fiscal year and industrial sector for the period from 1997 to 2003. Financial institutions are excluded from the sample. Other notable exclusions include IPOs, issues by non-Canadian firms, private placements, rights issues, and unit offerings.

Panel A. Distribution by year				
Year	Insured Firms		Uninsured Firms	
	Number of firms	% of sample	Number of firms	% of sample
1997	17	15.18	5	19.23
1998	14	12.50	4	15.38
1999	27	24.11	9	34.62
2000	27	24.11	3	11.54
2001	11	9.82	1	3.85
2002	8	7.14	3	11.54
2003	8	7.14	1	3.85
Total	112	100	26	100

Panel B. Distribution by Industry				
Industry	Insured Firms		Uninsured Firms	
	Number of firms	% of sample	Number of firms	% of sample
Agricultural industries	1	0.89	0	0.00
Biotechnology/pharmaceuticals	15	13.39	1	3.85
Communications and media	5	4.46	1	3.85
Construction	5	4.46	0	0.00
Consumer products	14	12.50	0	0.00
Industrial products	10	8.93	6	23.08
Merchandising	4	3.57	2	7.69
Mining and Natural Resources	20	17.86	12	46.15
Technology	26	23.21	4	15.38
Utility	3	2.68	0	0.00
Others	9	8.04	0	0.00
Total	112	100	26	100

Table II. 3
Descriptive Statistics

This table presents the descriptive statistics of the sample of Canadian 112 insured SEOs and 26 uninsured SEOs for the period 1997-2003. Panel A reports the results for the D&O liability insurance variables, Panel B for the SEO characteristic variables, Panel C for the firm's business risk variables, Panel D for the corporate governance variables, and Panel E for the long-term performance measures. For each variable, we show the number of observation, the mean, the standard deviation, the median, the mean change, the median change, the t-statistic, and the Z-statistic.

Variable	Insured Firms (N=112)				Uninsured Firms (N=26)			
	N	Mean	St. Dev.	Median	N	Mean	St. Dev.	Median
Panel A. D&O Liability Insurance Variables								
Coverage (\$millions)	112	18.506	13.804	15.000	26			
Premium (\$millions)	112	0.089	0.097	0.000	26			
Coverage/SEO size	112	0.887	2.168	0.447	26			
Premium/Coverage	112	0.005	0.005	0.004	26			
Panel B. SEO Characteristics								
SEO size (\$millions)	112	52.313	51.165	33.442	26	63.147	151.149	24.700
Fraction sold percent	111	13.120	7.721	11.000	26	18.429	8.510	18.891
Panel C. Firm's Business Risk Variables								
Leverage	107	0.601	1.105	0.243	26	0.680	0.591	0.616
Age	112	15.717	15.126	11.000	26	27.100	62.397	13.250
Revenue (\$millions)	112	372.831	1087.051	70.444	26	501.059	1365.791	17.967
SD adjusted revenue (\$millions)	112	269.208	1772.923	34.343	26	0.423	0.504	23.665
U.S. exchange listing dummy	112	0.045	0.207	0.000	26	0.077	0.272	0.000

Table II. 3 - Continued

Variable	Insured Firms (N=112)			Uninsured Firms (N=26)				
	N	Mean	St. Dev.	Median	N	Mean	St. Dev.	Median
Panel D. Corporate Governance Variables								
Board size	112	8.518	2.442	8.000	25	7.760	2.570	7.000
Pct. of outside directors	112	67.630	20.129	70.700	26	63.416	15.931	66.372
Blockholder	111	27.362	26.593	19.000	26	30.739	18.338	28.750
Executive cash comp (\$millions)	112	1.814	1.614	1.363	26	1.389	1.468	1.008
D&O ownership (%)	112	13.516	16.693	6.495	26	14.499	18.543	10.592
Big 4 auditor	111	0.865	0.343	1.000	26	0.962	0.196	1.000
Panel E. Long-Run Performance Measures								
3 years BHARs size & BM	112	-1.186	1.864	-0.907	26	-0.616	1.005	-0.529
3 years BHARs size	112	-0.892	1.759	-0.360	26	-0.779	1.608	-0.403
3 years BHARs value wighted (v.w) market index	112	1.893	1.165	1.525	26	0.122	0.854	0.029

Table II. 4
Predicting the D&O Insurance Purchase Decision

This table presents the results of a probit model designed to estimate the likelihood that an SEO purchase a D&O insurance policy. The explanatory variables are regressed on the dependent variable taking the value of 1 for firms with D&O insurance and 0 otherwise. The variables are defined in Table I. Coefficient estimates are presented with p-value in brackets below. Robust variance estimates are used. Significance at the 10 percent, 5 percent, and 1 percent level is noted by *, **, and ***, respectively.

Variable	(1)	(2)	(3)	(4)
Intercept	1.579 (0.044)**	1.134 (0.161)	1.612 (0.047)**	1.208 (0.188)
Age	-0.012 (0.008)***	-0.013 (0.004)***	-0.013 (0.007)***	-0.017 (0.002)***
Leverage	-0.110 (0.325)	-0.082 (0.464)	-0.114 (0.313)	-0.009 (0.927)
Average revenue	0.001 (0.032)**	0.001 (0.030)**	0.001 (0.026)**	0.001 (0.234)
Std dev revenue	-0.001 (0.021)**	-0.001 (0.020)**	-0.001 (0.017)**	0.000 (0.111)
U.S. exchange listing dummy	-0.165 (0.798)	-0.137 (0.833)	-0.173 (0.790)	0.077 (0.409)
Board size	0.077 (0.320)	0.070 (0.351)	0.076 (0.331)	0.006 (0.477)
Pct outside directors	0.003 (0.745)	0.005 (0.580)	0.003 (0.744)	-0.007 (0.255)
Blockholder	-0.005 (0.364)	-0.005 (0.368)	-0.005 (0.359)	-0.003 (0.730)
D&O ownership percent	-0.001 (0.881)	-0.002 (0.866)	-0.002 (0.871)	0.044 (0.761)
Executive cash compensation	0.097 (0.388)	0.111 (0.325)	0.098 (0.388)	-0.343 (0.546)
Big 4 auditor dummy	-0.756 (0.145)	-0.590 (0.232)	-0.762 (0.145)	0.006 (0.176)
SEO Size	-0.003 (0.457)	-0.002 (0.664)	-0.003 (0.456)	-0.029 (0.129)
Fraction sold	-0.027 (0.100)*	-0.030 (0.098)*	-0.027 (0.100)*	-0.026 (0.163)
3 y BHAR size and B/M		-0.205 (0.128)		
3 y BHAR size			0.015 (0.875)	
3 y BHAR v. w. Market index				-0.288 (0.275)
Number of observations	127	127	127	127
Adjusted R-squared	0.1474	17.28	14.76	24.57

Table II. 5
D&O insurance Coverage and Premium Variation Around SEO Announcement

This table presents the univariate results for the evolution from pre-SEO to post-SEO of D&O insurance coverage, premium, and deductible around SEO date for the period 1997-2003. Panel A reports the mean before and after SEO, the change in the mean, and the p-value of the ttest for the difference in means. Panel B reports the median before and after SEO, the change in the median, and the p-value of the Wilcoxon rank-sum test for the difference in medians. Significance at the 10 percent, 5 percent, and 1 percent level is noted by *, **, and ***, respectively.

Variable	N	Before SEO	After SEO	Change	<i>p</i> -value difference
Panel A. Mean					
Coverage (\$ millions)	111	13.938	19.080	5.142	0.000***
Premium (\$ millions)	91	0.075	0.109	0.034	0.000***
Deductible (\$ millions)	110	0.095	0.141	0.045	0.008***
Panel B. Median					
Coverage (\$ millions)	111	10	15	5	0.000***
Premium (\$ millions)	91	0.039	0.047	0.008	0.000***
Deductible (\$ millions)	110	0.025	0.05	0.025	0.000***

Table II. 6
Explaining the Total Amount of Coverage Purchased in the Secondary Market

This table shows the results of regressions that attempt to explain the amount of D&O insurance purchased by each SEO firm. The variables are defined in Table I. Coefficient estimates are presented with p-value in parentheses below. Robust variance estimates are used. Significance at the 10 percent, 5 percent, and 1 percent level is noted by *, **, and ***, respectively.

Variable	(1)	(2)	(3)	(4)
Intercept	1.291 (0.770)	0.447 (0.918)	-0.763 (0.858)	5.591 (0.252)
Age	0.136 (0.017)**	0.135 (0.018)**	0.148 (0.006)***	0.126 (0.025)**
Leverage	2.296 (0.042)**	2.353 (0.034)**	2.446 (0.036)**	2.438 (0.027)**
Average revenue	0.001 (0.834)	0.001 (0.830)	0.000 (0.865)	0.001 (0.817)
St. deviation revenue	0.000 (0.915)	0.000 (0.931)	0.000 (0.925)	0.000 (0.832)
U.S. exchange listing dummy	11.974 (0.000)***	12.196 (0.000)***	12.517 (0.000)***	11.872 (0.000)***
Board size	0.440 (0.331)	0.437 (0.329)	0.499 (0.263)	0.260 (0.570)
Pct outside directors	0.042 (0.291)	0.045 (0.250)	0.038 (0.336)	0.044 (0.285)
Blockholder	-0.111 (0.010)***	-0.109 (0.011)**	-0.103 (0.015)**	-0.107 (0.012)**
D&O ownership percent	-0.099 (0.049)**	-0.101 (0.046)**	-0.085 (0.090)*	-0.120 (0.020)**
Executive cash compensation	3.444 (0.000)***	3.452 (0.000)***	3.452 (0.000)***	3.455 (0.000)***
Big 4 auditor dummy	6.040 (0.016)**	6.279 (0.011)**	6.052 (0.015)**	6.250 (0.015)**
SEO Size	0.055 (0.016)**	0.058 (0.013)**	0.054 (0.010)***	0.050 (0.029)**
Fraction sold	-0.317 (0.004)***	-0.335 (0.003)***	-0.302 (0.006)***	-0.337 (0.002)***
3 y BHAR size and B/M		-0.396 (0.100)*		
3 y BHAR size			-1.093 (0.004)***	
3 y BHAR v. w. Market index				-1.271 (0.020)**
Number of observations	103	103	103	103
Adjusted R-squared	54.59	54.62	55.8	59.18

Table II. 7
Explaining the Insurance Premium

This table presents the results of regressions of second-stage regressions (equation (4)) that attempt to explain the amount of premium paid by the SEO firm to purchase the D&O insurance policy. The first stage (equation (2)) is a regression of the total coverage purchased on all of the explanatory variables listed in Table V excluding variables unknown at the time of SEO. The residuals from that regression are labeled "Unexplained Coverage," and enter into the second stage regressions reported here. Variable definitions are given in Table I. Coefficient estimates are presented with p-value in parentheses below. Robust variance estimates are used. Significance at the 10 percent, 5 percent, and 1 percent level is noted by *, **, and ***, respectively.

Variable	(1)	(2)	(3)	(4)
Intercept	0.093 (0.160)	0.094 (0.177)	0.076 (0.197)	0.120 (0.057)*
Age	0.001 (0.135)	0.001 (0.139)	0.001 (0.078)*	0.001 (0.175)
Leverage	0.009 (0.314)	0.009 (0.322)	0.010 (0.273)	0.014 (0.120)
Average revenue	0.000 (0.119)	0.000 (0.118)	0.000 (0.100)*	0.000 (0.087)*
Std dev revenue	0.000 (0.111)	0.000 (0.100)*	0.000 (0.095)*	0.000 (0.066)*
U.S. exchange listing dummy	0.088 (0.056)*	0.087 (0.057)*	0.090 (0.049)**	0.089 (0.078)*
Board size	0.002 (0.541)	0.002 (0.550)	0.003 (0.476)	0.000 (0.918)
Pct outside directors	-0.001 (0.200)	-0.001 (0.208)	-0.001 (0.191)	-0.001 (0.158)
Blockholder	0.000 (0.385)	0.000 (0.389)	0.000 (0.452)	0.000 (0.381)
D&O ownership percent	-0.001 (0.183)	-0.001 (0.188)	-0.001 (0.261)	-0.001 (0.084)*
Executive compensation	0.018 (0.020)**	0.018 (0.020)**	0.017 (0.018)**	0.018 (0.014)**
Big 4 auditor dummy	-0.001 (0.960)	-0.002 (0.945)	0.000 (0.993)	-0.002 (0.955)
SEO Size	0.000 (0.268)	0.000 (0.301)	0.000 (0.307)	0.000 (0.655)
Fraction sold	-0.002 (0.021)**	-0.002 (0.026)**	-0.002 (0.036)**	-0.002 (0.013)**

Table II. 7 - Continued

Variable	(1)	(2)	(3)	(4)
Unexplained coverage	0.004 (0.700)	0.004 (0.697)	0.003 (0.727)	0.015 (0.237)
Unexplained coverage*BHAR Size & B/M		0.000 (0.878)		
Unexplained coverage*BHAR Size			-0.003 (0.081)*	
Unexplained coverage* v. w. market index				-0.006 (0.056)*
Number of observation	103	103	103	103
Adjusted R-squared	31.68	31.07	37.18	32.01

Table II. 8

Three-Stage Estimation of the Insurance Coverage and Premium

This table reports the three-stage regression results of the relation between D&O coverage limit and premium for a sample of 112 Canadian insured SEOs for the period 1997-2003. Panel A examines the effect of long-term performance on the coverage level. Panel B investigates whether the D&O insurers are able to price the managerial opportunism translated into abnormal purchase of coverage. The variables are defined in Table I. Coefficient estimates are presented with p-value in parentheses below. Significance at the 10 percent, 5 percent, and 1 percent level is noted by *, **, and ***, respectively.

Variable	Panel A. Explaining the Total Amount of Coverage Purchased			Panel B. Explaining the Insurance Premium		
	(1)	(2)	(3)	(1)	(2)	(3)
Intercept	0.440 (0.928)	-0.983 (0.836)	5.930 (0.267)	0.077 (0.123)	0.060 (0.216)	0.102 (0.039)**
Age	0.135 (0.013)**	0.149 (0.005)***	0.125 (0.022)**	0.001 (0.175)	0.001 (0.116)	0.001 (0.264)
Leverage	2.354 (0.002)***	2.462 (0.001)***	2.449 (0.001)***	0.002 (0.852)	0.003 (0.745)	0.007 (0.452)
Average revenue	0.001 (0.773)	0.000 (0.830)	0.001 (0.759)	0.000 (0.146)	0.000 (0.129)	0.000 (0.127)
Std dev revenue	0.000 (0.914)	0.000 (0.910)	0.000 (0.785)	0.000 (0.141)	0.000 (0.124)	0.000 (0.100)*
U.S. exchange listing dummy	12.197 (0.001)***	12.575 (0.000)***	11.864 (0.001)***	0.078 (0.034)**	0.081 (0.024)**	0.080 (0.026)**
Board size	0.437 (0.302)	0.505 (0.221)	0.246 (0.569)	0.001 (0.789)	0.002 (0.716)	-0.001 (0.901)
Pct outside directors	0.045 (0.295)	0.037 (0.374)	0.044 (0.304)	-0.001 (0.133)	-0.001 (0.133)	-0.001 (0.100)*
Blockholder	-0.109 (0.001)***	-0.102 (0.002)***	-0.107 (0.001)***	-0.001 (0.095)*	0.000 (0.157)	-0.001 (0.098)*
D&O ownership percent	-0.101 (0.072)*	-0.084 (0.124)	-0.122 (0.031)**	-0.001 (0.304)	0.000 (0.377)	-0.001 (0.100)*
Executive cash compensation	3.452 (0.000)***	3.453 (0.000)***	3.456 (0.000)***	0.014 (0.015)**	0.014 (0.016)**	0.015 (0.009)***
Big 4 auditor dummy	6.280 (0.016)**	6.053 (0.016)**	6.267 (0.014)**	0.002 (0.949)	0.004 (0.868)	0.002 (0.926)
SEO Size	0.058 (0.004)***	0.054 (0.005)***	0.049 (0.013)**	0.000 (0.455)	0.000 (0.467)	0.000 (0.871)
Fraction sold	-0.335 (0.002)***	-0.300 (0.003)***	-0.338 (0.001)***	-0.002 (0.048)**	-0.002 (0.043)**	-0.002 (0.020)**
3 y BHAR size and B/M	-0.400 (0.336)					
3 y BHAR size		-1.209 (0.004)***				
3 y BHAR v. w. Market index			-1.371 (0.055)**			

Table II. 8 - Continued

Variable	Panel B. Explaining the Total Amount of Coverage Purchased			Panel C. Explaining the Insurance Premium		
	(1)	(2)	(3)	(1)	(2)	(3)
Unexplained coverage				0.016 (0.054)*	0.015 (0.067)*	0.026 (0.006)**
Unexplained coverage* 3 y BHAR size and B/M				0.000 (0.842)		
Unexplained coverage* 3 y BHAR size					-0.003 (0.032)**	
Unexplained coverage* 3 y BHAR v. w. Market index						-0.006 (0.028)**
Number of observations	103	103	103	103	103	103
Adjusted R-squared	65.08	66.88	65.76	30.17	33.38	33.43

Table II. 9
Explaining the Total Amount of Coverage Purchased by Multiple SEO Firms or Growth Firms

This table shows the results of regressions that attempt to explain the amount of D&O insurance purchased by each SEO firm. In panel A, dummy takes 1 for multiple SEOs and 0 otherwise, while in panel B, dummy takes 1 for growth firms and 0 otherwise. The variables are defined in Table I. Coefficient estimates are presented with p-value in parentheses below. Robust variance estimates are used. Significance at the 10 percent, 5 percent, and 1 percent level is noted by *, **, and ***, respectively.

Variable	Multiple SEO				Growth SEO			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Intercept	-3.877 (0.512)	-4.879 (0.423)	-5.395 (0.351)	4.462 (0.369)	1.652 (0.787)	1.049 (0.865)	1.416 (0.817)	2.810 (0.644)
Age	0.104 (0.105)	0.104 (0.110)	0.111 (0.076)*	0.069 (0.225)	0.085 (0.197)	0.090 (0.169)	0.085 (0.197)	0.084 (0.199)
Leverage	2.477 (0.055)*	2.541 (0.046)**	2.588 (0.049)**	1.055 (0.100)*	2.186 (0.078)*	2.292 (0.063)*	2.217 (0.077)*	2.358 (0.050)**
Average revenue	-0.001 (0.703)	-0.001 (0.729)	-0.001 (0.685)	0.003 (0.337)	-0.002 (0.635)	-0.002 (0.631)	-0.002 (0.642)	-0.002 (0.625)
Std dev revenue	0.001 (0.504)	0.001 (0.532)	0.001 (0.517)	-0.001 (0.636)	0.001 (0.453)	0.001 (0.453)	0.001 (0.471)	0.002 (0.376)
U.S. listing dummy	10.813 (0.000)***	11.140 (0.000)***	11.270 (0.000)***	10.402 (0.000)***	11.451 (0.000)***	12.020 (0.000)***	11.513 (0.000)***	11.145 (0.000)***
Board size	0.707 (0.164)	0.696 (0.162)	0.765 (0.128)	0.332 (0.506)	0.663 (0.190)	0.682 (0.170)	0.661 (0.191)	0.473 (0.362)
Pct outside directors	0.047 (0.263)	0.051 (0.224)	0.044 (0.285)	0.033 (0.459)	0.037 (0.382)	0.038 (0.367)	0.038 (0.368)	0.047 (0.279)
Blockholder	-0.078 (0.177)	-0.077 (0.184)	-0.070 (0.220)	-0.103 (0.012)**	-0.083 (0.146)	-0.082 (0.152)	-0.082 (0.155)	-0.081 (0.160)
D&O ownership percent	-0.091 (0.110)	-0.094 (0.100)*	-0.080 (0.162)	-0.080 (0.145)	-0.108 (0.067)*	-0.103 (0.082)*	-0.106 (0.078)*	-0.124 (0.039)**
Executive cash compensation	3.125 (0.001)***	3.143 (0.001)***	3.117 (0.001)***	2.419 (0.000)***	3.110 (0.001)***	3.127 (0.001)***	3.111 (0.001)***	3.170 (0.001)***

Table II. 9 - Continued

Variable	Multiple SEO				Growth SEO			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Big 4 auditor dummy	7.541 (0.006)***	7.825 (0.004)***	7.454 (0.005)***	5.338 (0.022)**	7.311 (0.008)***	7.543 (0.006)***	7.385 (0.008)***	7.877 (0.005)***
SEO Size	0.080 (0.023)**	0.083 (0.021)**	0.078 (0.027)**	0.075 (0.000)***	0.077 (0.023)**	0.079 (0.021)**	0.078 (0.023)**	0.073 (0.038)**
Fraction sold	-0.341 (0.002)***	-0.363 (0.001)***	-0.328 (0.004)***	-0.246 (0.009)***	-0.336 (0.003)***	-0.364 (0.002)***	-0.337 (0.003)***	-0.360 (0.002)***
Dummy	2.211 (0.253)	2.231 (0.250)	1.857 (0.341)	2.119 (0.198)	-3.003 (0.208)	-3.648 (0.135)	-3.292 (0.192)	-0.174 (0.957)
3 y BHAR size &_B/M*dummy		-0.516 (0.084)*				-0.645 (0.036)**		
3 y BHAR size*dummy			-0.947 (0.016)**				-0.380 (0.587)	
3 y BHAR market index*dummy				-0.859 (0.057)*				-1.585 (0.044)**
Number of observations	103	103	103	103	103	103	103	103
Adjusted R-squared	54.71	54.700	55.720	59.450	54.87	55.01	54.48	55.4

Table II. 10
Explaining the Total Amount of Coverage Purchased in the Secondary
Market Using Heckman selection model

This table shows the results of the Heckman selection model that attempt to explain the amount of D&O insurance purchased by each SEO by controlling for a potential selection bias in the sample. The variables are defined in Table I. Coefficient estimates are presented with p-value in parentheses below. Robust variance estimates are used. Significance at the 10 percent, 5 percent, and 1 percent level is noted by *, **, and ***, respectively.

Variable	(1)	(2)	(3)	(4)
Intercept	-2.616 (0.620)	-3.602 (0.505)	-4.415 (0.388)	0.483 (0.938)
Age	0.089 (0.144)	0.088 (0.148)	0.098 (0.093)*	0.081 (0.169)
Leverage	2.464 (0.034)**	2.530 (0.026)**	2.594 (0.028)**	2.580 (0.022)**
Average revenue	-0.001 (0.667)	-0.001 (0.692)	-0.002 (0.649)	-0.002 (0.653)
St. deviation revenue	0.001 (0.470)	0.001 (0.496)	0.001 (0.482)	0.001 (0.404)
U.S. exchange listing dummy	10.521 (0.000)***	10.843 (0.000)***	11.040 (0.000)***	10.391 (0.000)***
Board size	0.773 (0.100)*	0.762 (0.098)*	0.823 (0.078)*	0.647 (0.193)
Pct outside directors	0.051 (0.195)	0.055 (0.160)	0.047 (0.218)	0.052 (0.189)
Blockholder	-0.074 (0.170)	-0.073 (0.175)	-0.067 (0.214)	-0.071 (0.190)
D&O ownership percent	-0.093 (0.074)*	-0.096 (0.066)*	-0.082 (0.116)	-0.109 (0.048)**
Executive cash compensation	3.011 (0.001)***	3.026 (0.000)***	3.015 (0.000)***	3.011 (0.000)***
Big 4 auditor dummy	7.103 (0.004)***	7.384 (0.003)***	7.102 (0.003)***	7.296 (0.003)***
SEO Size	0.078 (0.016)**	0.081 (0.014)**	0.077 (0.017)**	0.076 (0.023)**
Fraction sold	-0.343 (0.001)***	-0.365 (0.000)***	-0.329 (0.001)***	-0.359 (0.000)***
3 y BHAR size and B/M		-0.513 (0.065)*		
3 y BHAR size			-0.990 (0.005)***	
3 y BHAR v. w. Market index				-0.956 (0.100)*
Number of observations	132	132	132	132