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Directors' and officers' legal liability insurance and audit pricing

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A B S T R A C T

Directors' and officers' (D&O) legal liability insurance is commonly provided to corporate executives and directors. Prior literature suggests managers are more willing to engage in opportunistic behaviors when their personal assets are more protected from litigation risk. Therefore, information about D&O policy details is potentially useful in assessing potential managerial opportunism. However, many countries, including the U.S., do not require firms to disclose this information. We provide evidence on whether mandatory D&O disclosures are likely to provide information about managerial opportunism that is incremental to that provided by other sources of information using a sample of Canadian firms, who are required to make D&O disclosures. We examine the association between excess D&O coverage limits and audit fees since auditors have extensive private information about the likelihood of managerial opportunism and strong incentives to incorporate this information into their audit fees. We find a positive association between excess D&O coverage limits and audit fees after controlling for numerous other audit fee determinants, including other proxies for managerial opportunism such as discretionary accruals and corporate governance variables. Additional analyses suggest auditors are more sensitive to potential managerial opportunism when managers are more likely to act on their opportunistic incentives. We also find a positive association between excess D&O coverage limits and the likelihood of future shareholder litigation. Our findings suggest that D&O insurance disclosures convey incremental information to shareholders and other capital market

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participants. As such, they suggest a beneficial role for mandatory D&O disclosures.

1. Introduction

Directors' and officers' (D&O) legal liability insurance is commonly provided by firms to their executives and directors. D&O insurance protects the personal assets of executives and directors from litigation. U.S. firms are not currently required by the Securities and Exchange Commission (SEC) to publicly disclose information about the D&O insurance they provide. While D&O insurance provides firms with a valuable recruiting and retention tool, excessive amounts of D&O coverage potentially exacerbates moral hazard problems and leads to more opportunistic behavior by executives as their personal wealth is insulated from the consequences of these behaviors. Evidence in Chalmers et al. (2002), Chung and Wynn (2008), among others, indicates excess D&O coverage limits are associated with opportunistic *ex post* outcomes. Accordingly, Griffith (2006) argues that disclosing D&O insurance policy details could provide important additional information concerning the firm's governance quality and overall risk to investors and other capital market participants.

We use D&O liability insurance coverage limits to construct a potentially powerful proxy for managerial opportunism. We expect D&O insurance coverage provides more precise signals of managerial opportunism relative to other measures for two reasons. First, to the extent that coverage limits are determined by the managers themselves, the decision to purchase excess coverage insurance will directly reflect their opportunistic intentions. Therefore, we expect coverage limits to provide more precise information about managers' opportunistic intentions compared to relatively coarse corporate governance measures, such as whether the CEO is also Chairman of the Board or the number of board meetings. Second, D&O insurance provides protection for a wide range of opportunistic behaviors (including those involving negligence, errors, or omissions) that may result in litigation or regulatory actions.[1] This broadness potentially allows excess coverage limits to be a more informative signal of managerial opportunism compared to narrow measures, such as discretionary accruals, which only capture one type of opportunistic managerial action. Thus, we expect D&O coverage limits to provide additional information about managerial opportunism beyond that provided by other publicly available proxies.

In order for mandatory D&O disclosures to be socially useful, a necessary condition is that they are incrementally informative about managerial opportunism beyond that provided by other publicly available information. Otherwise, it is difficult to argue that the benefits of mandatory disclosure would outweigh the costs. In this paper, we examine whether excess D&O insurance coverage is incrementally informative about managerial opportunism. If true, then mandatory D&O disclosures could potentially allow investors to better monitor executives and reduce agency costs. Such benefits are consistent with the reasons why the Securities and Exchange Commission (SEC) expanded executive compensation disclosure requirements in 1992 and 2006 (SEC Releases 33-6962 and 33-8732A, respectively). These reforms were intended to enhance shareholders' ability to monitor top executives, improve corporate governance, and ultimately, increase shareholder value by reducing agency costs (Quinn, 1995).[2] While empirical evidence on the effectiveness of these mandatory disclosures is limited, Vafeas and Afxentiou (1998) find the additional compensation disclosures mandated in 1992 resulted in improvements in corporate governance.

[1] Directors and officers often face potential liabilities associated with merger and acquisition activity, primary and secondary equity offerings, debt offerings, and bankruptcy filings in addition to liabilities associated with voluntary and mandatory financial disclosures.

[2] For example, SEC regulations adopted in 2006 required firms to disclose information about their use of compensation consultants, who are often subject to various conflicts of interest (Cadman et al., 2010).

In order to provide evidence on whether the disclosure of D&O insurance information would assist capital market participants in more precisely assessing the likelihood of opportunistic behavior by managers, we examine the association between excess D&O insurance coverage and audit fees. In doing so, we take advantage of the auditor's extensive *ex ante* private information about expected managerial opportunism. Auditors have inside knowledge of firms' operations, the strength of internal controls and various governance mechanisms, and intangibles like the character of management, company norms of behavior, and internal incentive structures. Included in this inside knowledge is information about the firm's D&O liability insurance. This private information allows them to form more precise beliefs regarding the likelihood of managerial opportunism, which in turn helps determine the expected litigation and reputation costs associated with the audit. In addition, auditors are highly concerned about potential managerial opportunism since it directly affects their reputation and litigation risk from the engagement (e.g., Hillegeist, 1999). Hence, the fees charged by the auditor will reflect the auditor's assessment of expected managerial opportunism. Accordingly, we expect audit fees to reflect auditors' unobservable private information about managerial opportunism and thus view audit fees as an excellent setting to examine the incremental information content of D&O insurance coverage disclosures.[3]

Among other things, managerial opportunism in a financial reporting context can manifest itself in aggressive accounting reporting choices[4] made by managers to attain their personal goals, such as meeting earnings benchmarks or bonus targets or achieving higher (lower) stock prices before raising capital (receiving stock options). In addition, opportunistic managers may exert undue pressure on internal control mechanisms. Such actions increase control risk by rendering the firm's internal control system less effective in detecting or correcting material misstatements in the financial reports. Such actions will compromise the quality of financial reporting; which in turn, increases the risk of future litigation and reputation losses. Thus, managerial opportunism is an important factor that auditors consider in assessing both audit risk and their risk of being named co-defendants in class action lawsuits.[5] Auditors respond to higher risk assessments by increasing audit efforts and/or charging additional premiums. Both actions result in higher audit fees.

D&O purchase decisions and coverage limits are based on a variety of other factors beyond managerial opportunism. Accordingly, we follow Chalmers et al. (2002) and others and proxy for managerial opportunism using the excess level of D&O insurance coverage beyond the coverage a firm would be expected to carry based on its economic characteristics. In this way, we attempt to isolate the information about managerial opportunism contained in the D&O disclosures.

We examine Canadian firms listed on the Toronto Stock Exchange (TSX) between 2002 and 2008 because disclosures of D&O insurance coverage (and audit fees) are publicly available via firms' proxy circulars.[6] In additional to firm-specific variables previously found to be associated with audit fees, we include several controls we expect to be associated with managerial opportunism. These include discretionary accruals and several governance-related variables. We also include the estimated *ex ante* probability of shareholder litigation to control for the possibility that higher litigation risk drives both excess D&O coverage and audit fees. After taking into account potential self-selection issues regarding the decision to purchase D&O insurance, we find robust evidence of a positive association between excess D&O

[3] An alternative approach would be to investigate whether D&O coverage is incrementally related to one of the *ex post* opportunistic outcomes that prior literature has examined (see the next section) after controlling for the additional opportunistic proxies. However, this approach lacks power in that a failure to reject the null hypothesis in one, relatively narrow, setting would not preclude D&O coverage from providing incremental information in other settings. An advantage of our approach is that by relying on the auditors' extensive private information about expected managerial opportunism, we rely on what is arguable a broader, more powerful and timely source of information because auditors will be affected by a broad range of opportunistic behaviors.

[4] Aggressive financial reporting encompasses a broader range of actions beyond discretionary accruals earnings management. For example, it includes other types of earnings management, such as classification shifting and real earnings management, inadequate conditional conservatism (i.e., excessive delays in writing down asset values), aggressive tax avoidance activities, and opportunistic financial disclosures (or opportunistic omissions of required disclosures).

[5] Auditors are frequently named as co-defendants in shareholder lawsuits against public firms and such lawsuits almost always result in settlements by auditors (Palmrose, 1997).

[6] Since 1993, the TSX has required firms to disclose D&O insurance policy details in proxy circulars. These disclosure requirements were instigated in order to strengthen corporate governance (Core, 1997).

insurance coverage limits and audit fees. This evidence suggests auditors charge higher fees to firms whose managers are more likely to behave opportunistically after controlling for other opportunism-related variables. The fact that excess coverage is significant in the presence of these other indicators of managerial opportunism further suggests excess D&O coverage captures a dimension of managerial opportunism not captured by the other measures.

In our setting, endogeneity is an obvious concern. Specifically, one might be concerned the association between D&O insurance coverage and audit fees is spurious because they are both (endogenously) driven by fundamental firm risk, especially litigation risk. It is plausible directors and officers of riskier firms demand greater levels of D&O insurance protection against the cost of litigation, while such firms are charged higher audit fees by auditors due to increased risk. To address this concern, we employ multiple statistical approaches, including an instrumental variable (IV) approach as well as including several variables to control for litigation risk in our audit fee regressions. In all cases, we continue to find a positive and significant association between excess D&O coverage and audit fees. We also employ an alternative approach where we use abnormal audit fees, which are estimated using a first-stage regression, as the depending variable. Consistent with our other results, we find a positive association between excess D&O coverage and abnormal audit fees.

In subsequent analyses, we examine the cross-sectional variation in the association between managerial opportunism and audit fees. We expect auditors' pricing decisions are more sensitive to their clients' excess D&O coverage when such coverage it more likely to result in opportunistic actions. Specifically, we predict and find evidence that the association between audit fees and excess D&O coverage is stronger when (1) discretionary accruals are high, (2) when there are fewer outside directors, and (3) when equity volatility is high. Thus, our evidence suggests that when auditors determine audit fees based on their *ex ante* risk assessments, they take into account private information about potential managerial opportunism that is incrementally reflected in excess D&O coverage levels.

In our final set of tests, we examine the association between excess D&O coverage and the risk of class action securities litigation by shareholders, which can be viewed as an *ex post* measure of managerial opportunism. We find excess D&O coverage is positively and significantly associated with the likelihood of future litigation by shareholders. Thus, excess D&O coverage is a litigation risk factor even after taking into account the possibility that excess coverage results in more audit effort, as suggested by the audit fee analyses. This finding supports auditors' decisions to charge higher fees to clients with excessive D&O coverage limits. Further analysis indicates the association between excess D&O coverage and litigation risk is concentrated in firms with high audit fees. Together, these results are consistent with excess D&O insurance leading to (or enabling) opportunistic behavior by executives.

In summary, our findings indicate that excess D&O coverage provides additional information about managerial opportunism beyond that found in other publicly available proxies of managerial opportunism. Thus, our analyses suggest D&O disclosures satisfy the necessary (but not sufficient) condition required for mandatory D&O disclosures to be socially beneficial. As such, our findings have important implications for regulators and capital market participants. Evidence in prior studies (Tadesse, 2006; Kanagaretnam et al., 2009; Lee, 2011) indicates financial statement users can benefit from increases in disclosure in a variety of settings.[7] Our evidence suggests D&O disclosures would be useful to investors in refining their assessments of the risk opportunistic behaviors by executives and hence, convey important information concerning the firm's governance quality and overall risk to investors and other capital market participants. As such, it supports the call for D&O disclosures made in Griffith (2006). Mandating the disclosure of D&O insurance policy details would potentially allow investors to reduce agency costs through more effective monitoring.

In addition, our examination of how managerial opportunism is related to audit pricing decisions and future litigation increases our understanding of the potential moral hazard problems that arise when managers are overly insulated from the legal consequences of their opportunistic behavior. As such, our evidence suggests excessive reductions in executives' personal legal liability impose costs

[7] Additional studies find mandated disclosures can provide investors with information useful in identifying excessive executive compensation and controlling agency related problems (Vafeas and Afxentiou, 1998; Kalyta and Magnan, 2008; Laksmana et al., 2012).

on shareholders in the form of higher audit fees as well as the costs associated with higher future litigation risk.

The remainder of this paper is organized as follows. We next review the institutional setting, related literature, and develop our hypotheses. Section 3 discusses the research design, sample selection, and descriptive statistics. We then present the results of our empirical analyses in Section 4. Section 5 summarizes and concludes.

2. Background and hypothesis development

2.1. D&O insurance and managerial optimism

Although D&O liability insurance first became available in the 1930s, it was not commonly purchased by corporations until the early to mid-1960s when directors and officers, along with their companies, began facing significant personal liability from more frequent claims and large settlements. In general, D&O insurance policies provide coverage that includes both corporate and personal coverage. Covered losses typically include compensatory damages, settlements, judgments, and litigation expenses incurred in defending against shareholder litigation, regulatory actions, or lawsuits from suppliers and customers.[8] D&O insurance coverage provides important protection for directors and officers from shareholder litigation by providing assurance their personal assets will not be at risk if they accept a board seat or executive position within a company. Thus, D&O insurance effectively shifts litigation costs from directors and officers to a third-party insurer. As such, D&O insurance enhances a firm's ability to recruit and retain qualified officers and directors.

The selection of the D&O insurance coverage limit involves the interplay of the firm's officers and directors and the insurance company. While directors and officers are important players in the process of purchasing D&O insurance, they do not uniquely determine the coverage amounts. Rather, the insurance company has to agree to the limits. To determine this, the D&O underwriter considers a number of factors, including the assessments of risk predictions models, the practices of peer firms, premiums, as well as the size of losses settled or awarded in the past. While this process likely reduces excessively high coverage requests, it is unlikely to completely eliminate excessive D&O coverage requests. Thus, we expect excessive D&O insurance coverage limits will contain unique private information about managerial opportunism given officers and directors participation in the process.

Using Canadian data, extant research indicates that firms where one might expect managerial opportunism to be more prevalent are both more likely to purchase D&O insurance and tend to obtain higher coverage limits. Core (1997) reports firms with greater inside voting control are more likely to purchase D&O insurance and carry higher coverage limits. Boyer (2007) find firms with weaker governance mechanisms, as indicated by fewer outsider directors and less equity ownership by directors, are more likely to buy D&O insurance.

In addition, prior studies find that the level of D&O coverage is positively associated with "opportunistic" outcomes. In terms of accounting outcomes, excess D&O coverage is negatively associated with earnings conservatism (Chung and Wynn, 2008) and accrual quality (Chung et al., 2013), and is positively associated with opportunistic earnings management (Boubakri et al., 2008) and the likelihood of a restatement (Kim, forthcoming; Lin et al., 2013). Furthermore, Cao and Narayanamoorthy (2011) find excess D&O coverage is negatively associated with the probability of a bad-news management earnings forecast. As such forecasts are negatively associated with litigation risk (Field et al., 2004), their results suggest mangers are more likely to employ opportunistic disclosure policies when they have excess D&O coverage.[9] These finding suggest that managers are more likely to engage in aggressive financial reporting and disclosure policies when their personal wealth is more insulated from the consequences of these aggressive reporting decisions.

[8] While D&O insurance typically covers a wide range of "wrongful acts" resulting in liability due to breaches of duty resulting from negligence, error, or omission or other acts resulting in litigation, coverage generally excludes dishonest, fraudulent, and criminal acts.

[9] Consistent with D&O insurance companies recognizing this fact, Cao and Narayanamoorthy (2014) find excess D&O coverage is positively and significantly associated with D&O premiums.

Other studies come to similar conclusions while studying non-accounting related opportunistic outcomes thought to be associated with opportunism. Using proprietary U.S. data, Chalmers et al. (2002) find that three-year post-IPO performance is negatively associated with excess D&O insurance coverage purchased at the time of the IPO. Since poor post-IPO performance increases the likelihood of shareholder litigation, their results indicate that managers tend to purchase D&O insurance when they are aware their firms are overvalued at the time of the IPO. Also using Canadian data, Lin et al. (2011b) find for firms making acquisitions, D&O coverage levels are associated with lower announcement-period abnormal stock returns, higher acquisition premiums, and lower merger synergies. Lin et al. (2013) find higher levels of D&O coverage are associated with higher loan spreads. Their evidence suggests lenders act as if D&O insurance coverage increases credit risk, potentially via increased moral hazard or information asymmetry.

Consistent with the prior literature, we expect "over-insured" firms tend to suffer moral hazard problems and information asymmetry problems that lead to opportunistic behaviors by managers. Auditors have access to the details of clients' D&O insurance policies since the insurance purchase is an auditable transaction and hence, is subject to auditor scrutiny.[10] In addition, Canadian auditors would require access to the details of the policy to ensure the accuracy of the mandated D&O insurance disclosures. Thus, auditors have access to information about the D&O purchases and hence, can incorporate it in their risk assessments.[11] Since auditors are quite sensitive to indications of reporting aggressiveness and opportunistic behavior in their clients, we expect excess D&O coverage to be significantly related to external auditors' client risk assessments.

2.2. Managerial opportunism, audit pricing, and litigation risk

As Francis and Krishnan (1999) discuss, one way in which auditors can respond to an engagement's perceived audit and litigation risk is to adjust their audit fees accordingly. While various frictions may prevent auditors from fully adjusting audit fees upwards to reflect higher perceived level of managerial opportunism, we expect auditors, on average, will charge higher fees for two reasons.[12] First, audit fees will increase to the extent auditors expand audit scope and assign more (and more experienced) professional staff to help mitigate these risks (Simunic and Stein, 1996). Second, auditors may charge a risk premium to compensate them for the additional audit risk the audit engagement entails (Abbott et al., 2006; Chen et al., 2012; Krishnan et al., 2012). Thus, understanding how client characteristics are associated with audit and litigation risk is important for auditors in assessing risk levels and instituting appropriate audit procedures (Stice, 1991). Pratt and Stice (1994) report that auditors identify managerial characteristics as the second-most important factor affecting their assessment of litigation risk, which is consistent with auditors being highly concerned with potential managerial opportunism.

The audit pricing literature provides evidence that auditors respond to higher perceived audit and litigation risks by demanding higher audit fees (Simunic, 1980; Hwang and Chang, 2010).[13] For example, Simunic (1980) finds that proxies for auditors' expected litigation costs are positively associated with current period audit fees. Abbott et al. (2006) and Gul et al. (2003) find positive associations between abnormal accruals and audit fees. Krishnan et al. (2012) find the issuance of a management earnings forecast in the prior period is positively associated with the current period audit fees, suggesting that

[10] The Canadian Business Corporations Act (Section 164(1)) specifically gives auditors broad access to company information, which would include its D&O policy.

[11] Our tests are unable to determine whether and to what extent auditors directly use information about excess D&O coverage in making their audit fee decisions or whether excess D&O coverage serves as an indirect proxy for auditors' other private information about managerial opportunism. In either case, the implications of our study remain the same.

[12] To the extent audit fees do not adjust quickly and completely to changes in the perceived risk of managerial opportunism, then the ability of our tests to reject the null hypothesis will be reduced. Similarly, to the extent that auditors respond to the perceived likelihood of managerial opportunism in ways that are not reflected in audit fees (for example, by dropping the client), then the ability of our tests to reject the null hypothesis will be reduced.

[13] Using U.S. and Hong Kong auditors employed by Big 4 accounting firms, Hwang and Chang (2010) find the litigation environment has a significant effect on auditors' judgments.

management's earnings forecast behavior captures higher business risk for the auditor via greater risk of earnings management or litigation risk.

Based on this evidence, we expect that auditors' assessment of managers' opportunistic behavior will influence auditor effort and audit fees. This assessment will go beyond the "baseline" level of litigation risk that is based on firm characteristics (such as industry, size, and stock price volatility). For example, opportunistic managers are more likely to exert pressure on internal control mechanisms to attain their goals. Such behavior increases control risk by rendering the firm's internal control system less effective in detecting or correcting material misstatements in financial reports, and thus compromises the quality of financial reporting. Hirst (1994) provides experimental evidence that (i) auditors are sensitive to managers' incentives for earnings management, and (ii) auditors adjust their assessment of the probability that a material misstatement exists accordingly. However, Hirst (1994) does not examine whether subject auditors increase audit effort and/or audit fees.

In summary, we expect that auditors' *ex ante* assessments of managerial opportunism are incrementally associated with excess D&O coverage amounts. We expect auditors to charge higher fees when they perceive that managers are more likely to behave opportunistically, since managers' opportunistic behavior increases total expected auditor costs. Accordingly, we make the following hypothesis:

H1. Audit fees are positively associated with the client firm's excess D&O insurance coverage limits.

The discussion above argues that auditors will charge clients with excessive levels of D&O insurance coverage higher audit fees since they expect more opportunistic behaviors by these firms. To the extent auditors' expectations are correct and audits are imperfect, then more opportunistic behavior by managers will lead to more lawsuits by shareholders after they become aware of managers' opportunistic behaviors. Kim (forthcoming) and Lin et al. (2013) find that D&O coverage is positively associated with restatements. As restatements are often followed by shareholder litigation, this evidence suggests that managerial opportunism is associated with future litigation. Accordingly, we make the following hypothesis:

H2. Excess D&O coverage limits are positively associated with the likelihood of class action securities litigation by shareholders.

3. Research design, sample selection, and descriptive statistics

3.1. Research design

We are interested in examining the cross-sectional association between excess D&O coverage limits and audit fees (litigation risk). In this section, we first discuss how we estimate excess D&O coverage. We then discuss how we estimate the association between excess D&O coverage and audit fees after taking into account the potentially endogenous relation between them. Next we discuss how we estimate the *ex ante* probability of class action securities litigation and examine the association between our estimates of litigation risk and excess D&O coverage. Finally, we discuss our sample and descriptive statistics.

3.1.1. Estimating excess D&O insurance coverage

Following Chalmers et al. (2002), we measure excess D&O coverage (EXCOV) as the residuals from Eq. (1), which regresses the natural logarithm of D&O coverage limits (COVERAGE) in year t on previously identified coverage determinants. Note that given the possibility that litigation risk not associated with managerial opportunism drives both the D&O coverage decision and

audit pricing decision, we include several variables in Eq. (1) to control for this type of litigation risk[14]:

$$\begin{aligned}\text{COVERAGE} = {} & \alpha_0 + \alpha_1\text{SIZE} + \alpha_2\text{MTB} + \alpha_3\text{DEBT} + \alpha_4\text{STDRET} + \alpha_5\text{LAGROA} + \alpha_6\text{HIGHTECH} \\ & + \alpha_7\text{REGULATED} + \alpha_8\text{LAGREV} + \alpha_9\text{CROSS} + \alpha_{10}\text{CEOOWN} + \alpha_{11}\text{CEOCHAIR} \\ & + \alpha_{12}\text{OUTDIR} + \alpha_{13}\text{BLOCK} + \alpha_{14}\text{BRDMEET} + \alpha_{15}\text{PMDA} + \lambda_i\text{INDUSTRY}_i \\ & + \gamma_j\text{YEAR}_j + \varepsilon \end{aligned} \quad (1)$$

SIZE is the natural log of lagged total assets. MTB is the ratio of the market value of equity to the book value of equity. DEBT is total debt scaled by total assets. STDRET is the standard deviation of stock returns over the prior year. LAGROA is the lagged return on assets. HIGHTECH is an indicator variable that equals one if a firm is a member of the Pharmaceuticals (SIC codes 2833–2836), R&D Services (8731–8734), Programming (7371–7379), Computers (3570–3577), or Electronics (3600–3674) industries, and zero otherwise. REGULATED is an indicator variable that equals one if a firm is a member of the Telephone (SIC codes 4812–4813), TV (4833), Cable (4841), Communications (4811–4899), Gas (4922–4924), Electricity (4931), Water (4941), or Financial (6021–6023, 6035–6036, 6141, 6311, 6321, 6331) industries, and zero otherwise. LAGREV is the natural logarithm of lagged sales revenue. CROSS is an indicator variable that equals one if the firm is cross-listed in the U.S., and zero otherwise. CEOOWN is the percentage of shares held by the chief executive officer. CEOCHAIR is an indicator variable that equals one if the CEO is also the chairperson of the board of directors, and zero otherwise. OUTDIR is the percentage of outside directors on the board of directors. BLOCK is the percentage of ownership held by outside shareholders who individually own over 10% of the firm's stock.[15] BRDMEET is the number of meetings held by the board of directors during the fiscal year. PMDA is performance-matched discretionary accruals estimated following the procedure discussed below. INDUSTRY is a vector of industry indicator variables based on 1-digit SIC codes and YEAR is a vector of year indicator variables. All contemporaneous variables are measured as of the end of the same fiscal year in which COVERAGE is measured while all lagged variables are measured as of the end of the previous fiscal year.

3.1.2. Estimating the relation between excess D&O insurance coverage and audit fees

The relation between audit fees and D&O purchase decisions is potentially endogenous. Variations in audit fees could be driven by systematic differences between purchasers and non-purchasers of D&O insurance. For instance, since auditing is a governance mechanism, higher governance quality through better audits (and thus higher audit fees) could affect D&O purchase decisions. Similarly, a higher level of baseline litigation risk could affect both D&O purchase decisions and audit fees. In order to address this potential issue, we use the Heckman (1979) two-stage approach to analyze the association between D&O legal liability coverage and audit fees.

In the first stage, we run the following probit model where the choice to purchase D&O coverage is the dependent variable and the independent variables represent a similar but not identical set of determinants compared to those in Eq. (1). PURCHASE is an indicator variable that equals one if the client firm purchased any amount of D&O insurance in year *t*, and zero otherwise.

$$\begin{aligned}\text{Prob}(\text{PURCHASE} = 1) = {} & \alpha_0 + \alpha_1\text{SIZE} + \alpha_2\text{MTB} + \alpha_3\text{DEBT} + \alpha_4\text{LAGROA} + \alpha_5\text{ACQDIVEST} \\ & + \alpha_6\text{HIGHTECH} + \alpha_7\text{REGULATED} + \alpha_8\text{CROSS} + \alpha_9\text{CEOOWN} \\ & + \alpha_{10}\text{CEOCHAIR} + \alpha_{11}\text{OUTDIR} + \alpha_{12}\text{BLOCK} + \alpha_{13}\text{BRDMEET} \\ & + \alpha_{14}\text{PMDA} + \lambda_i\text{INDUSTRY}_i + \gamma_j\text{YEAR}_j + \varepsilon \end{aligned} \quad (2)$$

[14] Variable definitions and data sources are provided in the Appendix A. In untabulated regressions, we further control for the potentially confounding effect of the baseline level of litigation risk driving both coverage decisions and audit fees by including the estimated probability of litigation risk (PROBLIT) in the D&O coverage model (and the coverage decision model discussed below). PROBLIT is a fitted value obtained from the litigation risk model (described below) excluding EXCOV. Untabulated results indicate the PROBLIT coefficient is not significant and our stage 2 audit fee results are not affected.

[15] Canadian firms are required to disclose block shareholders who own over 10% of a firm's stock.

ACQDIVEST is an indicator variable that equals one if the book value of total assets at the end of the fiscal year increases or decreases by more than 25% during the fiscal year, and zero otherwise. Other variables are as defined above.

In the second stage, we use Eq. (3) to estimate audit fees as a function of excess D&O coverage, other proxies for managerial opportunism, numerous audit fee determinants identified in the prior literature, and the inverse Mills ratio (MILLS) obtained from the first-stage estimation of Eq. (2). The dependent variable is the natural log of audit fees in year t (AUDITFEE).

$$\begin{aligned}\text{AUDITFEE} = {} & \gamma_0 + \gamma_1\text{EXCOV} + \gamma_2\text{PMDA} + \gamma_3\text{CEOOWN} + \gamma_4\text{CEOCHAIR} + \gamma_5\text{OUTDIR} \\ & + \gamma_6\text{BLOCK} + \gamma_7\text{BRDMEET} + \gamma_8\text{PROBLIT} + \gamma_9\text{SIZE} + \gamma_{10}\text{NUMSEG} \\ & + \gamma_{11}\text{RECINV} + \gamma_{12}\text{FOREIGN} + \gamma_{13}\text{LOSS} + \gamma_{14}\text{DEBT} + \gamma_{15}\text{STDRET} + \gamma_{16}\text{MTB} \\ & + \gamma_{17}\text{FIN} + \gamma_{18}\text{UTIL} + \gamma_{19}\text{CROSS} + \gamma_{20}\text{BIG4} + \gamma_{21}\Delta\text{AUDITOR} + \gamma_{22}\text{REPORTLAG} \\ & + \gamma_{23}\text{NONAUDIT} + \gamma_{24}\text{ATENURE} + \gamma_{25}\text{SPECIALIST} + \gamma_{26}\text{MILLS} + \lambda_i\text{INDUSTRY}_i \\ & + \gamma_j\text{YEAR}_j + \varepsilon \end{aligned} \tag{3}$$

EXCOV is the excess D&O coverage limits measured as the residual obtained from the estimation of Eq. (1). According to hypothesis H1, the coefficient on EXCOV is expected to be significantly positive ($\gamma_1 > 0$).

Discretionary accruals represent an alternative measure of managerial opportunism that has been used in the literature (Abbott et al., 2006; Gul et al., 2003). Following Kothari et al. (2005), we measure performance-matched discretionary accruals (PMDA) as the difference between the firm-specific residual from the following model and the median firm-specific residual from the same two-digit SIC/ROA decile in year $t-1$: $\text{ACCRUALS}_t = \delta_1\text{CFO}_{t-1} + \delta_2\text{CFO}_t + \delta_3\text{CFO}_{t+1} + \delta_4\Delta\text{REV}_t + \delta_5\text{PPE}_t + \varepsilon_t$, where ACCRUALS is earnings before extraordinary items minus cash flow from operations, CFO is cash flows from operations, ΔREV is the annual change in revenues, and PPE is gross property, plants, and equipment, all deflated by the lagged total assets. We expect PMDA to have a positive coefficient (Hogan and Wilkins, 2008).

To the extent corporate governance variables provide information about managerial opportunism, it is important to include these variables to determine whether D&O insurance disclosures provide incremental information about managerial opportunism. In addition, the prior literature suggests that variables related to corporate governance are likely correlated with both audit fees and excess D&O coverage. For example, firms with strong governance could demand higher levels of both D&O insurance and audit quality if these monitoring attributes are complements (Carcello et al., 2002). In this case, excessive D&O insurance coverage will be positively associated with audit fees if governance attributes are excluded from the regression.

We include five governance-related variables commonly used in prior literature: (1) CEOOWN, (2) CEOCHAIR, (3) OUTDIR, (4) BLOCK, and (5) BRDMEET. Based on the prior literature, we expect audit fees to be positively associated with CEOOWN (Cheng and Warfield, 2005), CEOCHAIR (Tsui et al., 2001), OUTDIR (Carcello et al., 2002), and BRDMEET (Carcello et al., 2002). If blockholders provide additional outside monitoring, then high blockholder firms would be associated with lower audit fees (Mitra et al., 2007). On the other hand, if blockholders demand higher quality audits, then high blockholder firms would be associated with higher audit fees. Thus, we do not make a directional prediction for BLOCK.

To control for the potentially confounding effect of the baseline level of litigation risk driving both coverage decisions and audit fees, we include the estimated probability of litigation risk (PROBLIT) in the audit fee model. PROBLIT is a fitted value obtained from the litigation risk model (described in the following section), excluding EXCOV.

In addition, we control for other economic determinants of audit fees that have been identified in the literature. NUMSEG is the number of business segments. RECINV is the sum of receivables and inventory divided by total assets. FOREIGN is an indicator variable that equals one if a firm reports foreign currency adjustments, and zero otherwise. LOSS is an indicator variable that equals one if a client firm reports a loss in each of the prior two years, and zero otherwise. FIN is an indicator variable that equals one if a firm is in the financial industry (SIC codes 6000–6099, 6200–6299), and zero otherwise.

UTIL is an indicator variable that equals one if the firm is in the utilities industries (4900–4999), and zero otherwise. BIG4 is an indicator variable that equals one if an auditor is one of the Big 4 audit firms, and zero otherwise. ΔAUDITOR is an indicator variable that equals one if the firm has a new auditor, and zero otherwise. REPORTLAG is the number of calendar days between the fiscal year-end date to the filing date of the audit report, divided by 100. NONAUDIT is an indicator variable that equals one if the auditor also provided non-audit services, and zero otherwise. ATENURE is the number of years that the auditor has been retained by the firm. SPECIALIST is an indicator variable that equals one if the auditor's market share based on clients' total assets is the highest within the two-digit SIC industry group, and zero otherwise. Other variables are defined as above.

Based on the prior literature, we expect audit fees to be positively associated with SIZE, NUMSEG, RECINV, LOSS and DEBT (Simunic, 1980), FOREIGN (Whisenant et al., 2003), STDRET (Hogan and Wilkins, 2008), MTB (Tsui et al., 2001), CROSS (Seetharaman et al., 2002), BIG4 and NONAUDIT (Hay et al., 2006), REPORTLAG (Knechel and Payne, 2001), and SPECIALIST (Craswell et al., 1995). We expect a negative association between audit fees and FIN, UTIL, ΔAUDITOR, and ATENURE (Hay et al., 2006).

3.1.3. Estimating the relation between excess D&O insurance coverage and litigation risk

We estimate the probability of litigation as a function of excess D&O coverage, discretionary accruals, and litigation risk determinants identified in the prior literature, including Johnson et al. (2001), Brown et al. (2005), and Kim and Skinner (2012). According to hypothesis H2, the coefficient on EXCOV is expected to be significantly positive ($\delta_1 > 0$) in Eq. (4):

$$\begin{aligned}\text{Prob}(\text{LITIGATION} = 1) = G(&\delta_0 + \delta_1\text{EXCOV} + \delta_2\text{PMDA} + \delta_3\text{SIZE} + \delta_4\text{CROSS} + \delta_5\text{LEV} + \delta_6\text{MTB}\\ &+ \delta_7\text{EARNCHG} + \delta_8\text{SGROWTH} + \delta_9\text{GW} + \delta_{10}\text{PPE} + \delta_{11}\text{STDRET}\\ &+ \delta_{12}\text{SKEWRET} + \delta_{13}\text{CAR} + \delta_{14}\text{EQISSUE} + \delta_{15}\text{DISSUE} + \delta_{16}\text{NYSE}\\ &+ \delta_{17}\text{CEOOWN} + \delta_{18}\text{CEOCHAIR} + \delta_{19}\text{OUTDIR} + \delta_{20}\text{BLOCK}\\ &+ \delta_{21}\text{HIGHTECH} + \phi_i\text{INDUSTRY}_i + \varphi_j\text{YEAR}_j) \end{aligned} \quad (4)$$

where $G(\cdot)$ is the standard normal cumulative distribution function, and LITIGATION is an indicator variable equal to one if the firm was a defendant in a class action securities lawsuit at least once in fiscal years t through $t+4$, and zero otherwise.[16] LEV is the ratio of total liabilities to stockholders' equity. EARNCHG is the earnings change, as measured by the difference between current year income and prior income, deflated by share price. SGROWTH is the sales growth from prior year. GW is the goodwill over lagged total assets. PPE is property, plant, and equipment over lagged total assets. SKEWRET is the skewness of returns over prior year. CAR is the cumulative abnormal returns over prior year. EQISSUE (DISSUE) is an indicator variable that equals one if the firm issues new shares (long-term debt), and zero otherwise. NYSE is an indicator variable that equals one if the firm is listed on NYSE, and zero otherwise. Other variables are defined as above. Data sources are provided in the Appendix A.

3.2. Sample selection

The sample consists of Canadian firms listed on the Toronto Stock Exchange (TSX) that were in the S&P TSX Composite index (formerly the TSE 300 index) between 2002 and 2008, inclusive.[17] The Compustat index constituents quarterly file is used to identify firms in the S&P TSX Composite index. D&O insurance data are hand-collected from proxy circulars available at www.sedar.com. Panel A of Table 1 outlines the sample selection process. The initial sample consists of 3890 firm-years for 574 firms identified from the quarterly Compustat index constituents file. We exclude 849 firm-years (59 firms)

[16] We obtained the litigation data from the Stanford Securities Class Action Clearinghouse for suits filed in U.S. federal court and LexisNexis Academics for Canadian legal cases filed in federal and Ontario jurisdictions. We chose a four-year period to account for any delays between the filing of the litigation and when the precipitating actions (potentially caused by managerial opportunism) took place.

[17] Multilateral Instrument 52-110 became effective on March 31, 2004 and provides rules for the disclosure of external auditor service fees. 2002 and 2003 fees are available in 2004 proxy circulars that provide comparative information, providing a firm's fees during the prior two fiscal years.

Table 1
Sample selection and descriptive statistics.

Panel A: Sample selection

Sample period: 2002–2008	No. of firm-years	No. of firms
Firms on S&P TSX composite index	3890	574
Merged, acquired, delisted, or bankrupt	(849)	(59)
Changed cross-listing status during a year	(107)	(7)
Financials unavailable in Compustat	(1130)	(205)
D&O insurance coverage limits unavailable	(74)	(8)
Governance data unavailable	(455)	(33)
Audit fees unavailable	(85)	(19)
Returns unavailable	(252)	(37)
Final sample	938	266

Panel B: Descriptive statistics of full sample (N = 938)

	Mean	Minimum	Median	Maximum	Maximum
Audit Fees	2.19	0.05	0.86	72.56	5.22
LNAF	13.67	10.82	13.66	16.99	1.25
D&O Coverage Limits	58.60	0.00	32.53	357.36	72.29
LNCOV	13.80	0.00	17.30	19.69	7.41
EXCOV	0.00	−16.15	2.35	8.89	6.71
PMDA	−0.01	−0.71	0.00	0.55	0.22
SIZE	7.24	3.22	7.04	12.81	1.87
MTB	2.58	−1.28	1.97	14.39	2.28
DEBT	0.21	0.00	0.19	0.76	0.18
STDRET	1.38	0.94	1.43	1.43	0.11
LAGROA	0.01	−0.75	0.03	0.25	0.14
LAGREV	0.71	0.00	0.50	4.19	0.63
EARNCHG	−5.89	−185.69	0.37	1.32	24.54
SGROWTH	0.13	−0.34	0.05	7.92	0.39
GW	0.10	0.00	0.02	2.89	0.20
PPE	0.56	0.00	0.47	8.46	0.64
SKEWRET	0.17	−7.16	0.22	2.78	1.18
CAR	0.01	−0.84	−0.04	4.08	0.45
NUMSEG	2.24	1.00	1.00	8.00	1.81
RECINV	0.22	0.00	0.15	0.82	0.20
REPORTLAG	0.55	0.17	0.53	2.01	0.20
ATENURE	10.45	1.00	9.00	35.00	6.92
CEOOWN	0.03	0.00	0.00	0.48	0.08
OUTDIR	0.82	0.50	0.86	1.00	0.10
BLOCK	0.06	0.00	0.00	0.39	0.10
BRDMEET	9.48	3.00	9.00	25.00	4.16

PURCHASE	730 (78%) firm-years w/ D&O insurance vs. 208 (22%) firm-years w/o D&O insurance ($\chi^2 = 290$)
HIGHTECH	109 (12%) of firm-years are in high tech industries vs. 829 (88%) in other industries ($\chi^2 = 553$)
REGULATED	72 (8%) of firm-years are in regulated industries vs. 866 (92%) in other industries ($\chi^2 = 672$)
ACQDIVEST	273 (29%) of firm-years w/ large changes in assets vs. 665 (71%) w/o large changes ($\chi^2 = 164$)
CROSS	465 (50%) cross-listed firm-years vs. 473 (50%) local firm-years ($\chi^2 = 0.07$)
CEOCHAIR	202 (22%) firm-years with CEO = chairman vs. 736 (78%) with CEO ≠ chairman ($\chi^2 = 304$)
FOREIGN	438 (47%) firm-years with foreign operations vs. 500 (53%) without foreign operations ($\chi^2 = 4$)
LOSS	306 (33%) firm-years with losses vs. 632 (67%) without losses ($\chi^2 = 113$)
FIN	56 (6%) firm-years in financial industries vs. 882 (94%) in other industries ($\chi^2 = 727$)
UTIL	33 (4%) firm-years in utility industries vs. 905 (96%) in other industries ($\chi^2 = 811$)
BIG4	884 (94%) firm-years with Big 4 auditors vs. 54 (6%) with non-Big 4 auditors ($\chi^2 = 734$)
ΔAUDITOR	3 (0.3%) firm-years with auditor change vs. 935 (99.7%) without auditor change ($\chi^2 = 926$)
NONAUDIT	879 (94%) firm-years with non-audit services vs. 59 (6%) without ($\chi^2 = 717$)
SPECIALIST	17 (2%) firm-years whose auditor is a specialist vs. 921 (98%) firm-years without specialist ($\chi^2 = 871$)
EQISSUE	709 (76%) firm-years with equity issue vs. 229 (24%) firm-years without ($\chi^2 = 246$)
DISSUE	585 (62%) firm-years with debts issue vs. 353 (38%) firm-years without ($\chi^2 = 57$)
NYSE	293 (31%) firm-years listed on NYSE vs. 645 (69%) firm-years not listed ($\chi^2 = 132$)
LITIGATION	36 (4%) firm-years with lawsuits vs. 902 (96%) firm-years without ($\chi^2 = 800$)

(*continued on next page*)

Table 1 (*continued*)

Panel C: Descriptive statistics of firms with D&O insurance (N = 730)

	Mean	Minimum	Median	Maximum	Std. dev.
Audit Fees	2.50	0.05	1.01	72.56	5.66
LNAF	13.84	10.82	13.82	16.99	1.22
D&O Coverage Limits	75.30	0.50	50.00	357.36	73.87
LNCOV	17.73	15.42	17.73	19.69	0.91
EXCOV	3.31	−3.52	3.38	8.89	2.47
PMDA	−0.01	−0.71	0.00	0.55	0.22
SIZE	7.43	3.22	7.26	12.81	1.87
MTB	2.44	−1.28	1.95	14.39	2.01
DEBT	0.22	0.00	0.20	0.76	0.18
STDRET	1.38	0.94	1.43	1.43	0.12
LAGROA	0.02	−0.75	0.04	0.25	0.13
LAGREV	0.71	0.00	0.50	3.50	0.60
EARNCHG	−5.46	−185.69	0.42	1.32	23.44
SGROWTH	0.12	−0.34	0.05	7.92	0.41
GW	0.11	0.00	0.03	2.89	0.22
PPE	0.51	0.00	0.42	8.46	0.66
SKEWRET	0.11	−7.16	0.17	2.78	1.21
CAR	0.01	−0.84	−0.04	4.08	0.45
NUMSEG	2.27	1.00	1.00	8.00	1.84
RECINV	0.23	0.00	0.16	0.82	0.20
REPORTLAG	0.52	0.19	0.51	2.01	0.19
ATENURE	10.83	1.00	10.00	35.00	6.96
CEOOWN	0.03	0.00	0.00	0.48	0.08
OUTDIR	0.82	0.50	0.86	1.00	0.11
BLOCK	0.06	0.00	0.00	0.39	0.10
BRDMEET	9.70	3.00	9.00	25.00	4.13

HIGHTECH	94 (13%) of firm-years in high tech industries vs. 636 (87%) in other industries (χ^2 = 402)
REGULATED	57 (8%) of firm-years in regulated industries vs. 673 (92%) in other industries (χ^2 = 520)
ACQDIVEST	193 (26%) of firm-years w/ large changes in assets vs. 537 (74%) w/o large changes (χ^2 = 162)
CROSS	377 (52%) cross-listed firm-years vs.353 (48%) local firm-years (χ^2 = 0.80)
CEOCHAIR	138 (19%) firm-years with CEO = chairman vs. 592 (81%) with CEO ≠ chairman (χ^2 = 282)
FOREIGN	314 (43%) firm-years with foreign operations vs. 416 (57%) without foreign operations (χ^2 = 14)
LOSS	210 (29%) firm-years with losses vs. 520 (71%) without losses (χ^2 = 132)
FIN	54 (7%) firm-years in financial industries vs. 676 (93%) in other industries (χ^2 = 530)
UTIL	29 (4%) firm-years in utility industries vs. 701 (96%) in other industries (χ^2 = 619)
BIG4	688 (94%) firm-years with Big 4 auditors vs. 42 (6%) with non-Big 4 auditors (χ^2 = 572)
ΔAUDITOR	3 (0.4%) firm-years with auditor change vs. 727 (99.6%) without auditor change (χ^2 = 718)
NONAUDIT	696 (95%) firm-years with non-audit services vs. 34 (5%) without (χ^2 = 600)
SPECIALIST	17 (2%) firm-years whose auditor is a specialist vs. 713 (98%) firm-years without specialist (χ^2 = 664)
EQISSUE	543 (74%) firm-years with equity issue vs. 187 (26%) firm-years without (χ^2 = 174)
DISSUE	469 (64%) firm-years with debts issue vs. 261 (36%) firm-years without (χ^2 = 59)
NYSE	253 (35%) firm-years listed on NYSE vs. 477 (65%) firm-years not listed (χ^2 = 69)
LITIGATION	34 (5%) firm-years with lawsuits vs. 696 (95%) firm-years without (χ^2 = 600)

Panel D: Descriptive statistics of firms without D&O insurance (N = 208)

	Mean	Minimum	Median	Maximum	Std. dev.
Audit Fees	1.07	0.05	0.53	40.30	2.98
LNAF	13.07	10.82	13.17	16.99	1.17
EXCOV	−11.62	−16.15	−11.35	−2.92	2.80
PMDA	−0.00	−0.71	0.00	0.55	0.23
SIZE	6.55	3.22	6.47	12.81	1.73
MTB	3.06	−1.28	2.04	14.39	3.00
DEBT	0.19	0.00	0.15	0.76	0.17
STDRET	1.40	0.94	1.43	1.43	0.09
LAGROA	−0.01	−0.75	0.02	0.25	0.17
LAGREV	0.71	0.00	0.53	4.19	0.74
EARNCHG	−7.37	−185.69	0.15	1.32	28.06
SGROWTH	0.16	−0.34	0.08	2.97	0.33
GW	0.07	0.00	0.01	0.99	0.13

PPE	0.72	0.00	0.68	3.45	0.55
SKEWRET	0.39	−7.16	0.33	2.78	1.04
CAR	0.00	−0.84	−0.03	2.41	0.46
NUMSEG	2.14	1.00	1.00	8.00	1.70
RECINV	0.17	0.00	0.11	0.82	0.18
REPORTLAG	0.63	0.17	0.64	0.94	0.20
ATENURE	9.12	1.00	8.00	35.00	6.62
CEOOWN	0.04	0.00	0.00	0.48	0.08
OUTDIR	0.81	0.50	0.83	1.00	0.10
BLOCK	0.06	0.00	0.00	0.37	0.10
BRDMEET	8.70	3.00	8.00	25.00	4.17

HIGHTECH	15 (7%) of firm-years are in high tech industries vs. 193 (93%) in other industries ($\chi^2 = 152$)
REGULATED	15 (7%) of firm-years are in regulated industries vs. 193 (93%) in other industries ($\chi^2 = 152$)
ACQDIVEST	80 (38%) of firm-years w/ large changes in assets vs. 128 (62%) w/o large changes ($\chi^2 = 11$)
CROSS	88 (42%) cross-listed firm-years vs. 120 (58%) local firm-years ($\chi^2 = 5$)
CEOCHAIR	64 (31%) firm-years with CEO = chairman vs. 144 (69%) with CEO ≠ chairman ($\chi^2 = 31$)
FOREIGN	124 (60%) firm-years with foreign operations vs. 84 (40%) without foreign operations ($\chi^2 = 8$)
LOSS	96 (46%) firm-years with losses vs. 112 (54%) without losses ($\chi^2 = 1$)
FIN	2 (1%) firm-years in financial industries vs. 206 (99%) in other industries ($\chi^2 = 200$)
UTIL	4 (2%) firm-years in utility industries vs. 204 (98%) in other industries ($\chi^2 = 192$)
BIG4	196 (94%) firm-years with Big 4 auditors vs. 12 (6%) with non-Big 4 auditors ($\chi^2 = 163$)
ΔAUDITOR	0 (0%) firm-years with auditor change vs. 208 (100%) without auditor change ($\chi^2 = 0$)
NONAUDIT	183 (88%) firm-years with non-audit services vs. 25 (12%) without ($\chi^2 = 120$)
SPECIALIST	0 (0%) firm-years whose auditor is a specialist vs. 208 (100%) firm-years without specialist ($\chi^2 = 0$)
EQISSUE	166 (80%) firm-years with equity issue vs. 42 (20%) firm-years without ($\chi^2 = 74$)
DISSUE	116 (56%) firm-years with debts issue vs. 92 (44%) firm-years without ($\chi^2 = 3$)
NYSE	40 (19%) firm-years listed on NYSE vs. 168 (81%) firm-years not listed ($\chi^2 = 79$)
LITIGATION	2 (1%) firm-years with lawsuits vs. 206 (99%) firm-years without ($\chi^2 = 200$)

Panel E: T-tests and Wilcoxon tests for firms with D&O vs. firms without D&O insurance

	(1)		(2)	
	t-value	(*p*-value)	*z*-value	(*p*-value)
LNAF	8.12	(<0.01)***	7.68	(<0.01)***
EXCOV	74.73	(<0.01)***	22.02	(<0.01)***
PMDA	−0.29	(0.77)	0.20	(0.42)
SIZE	6.10	(<0.01)***	5.70	(<0.01)***
MTB	−3.50	(<0.01)***	−1.29	(0.10)*
DEBT	1.92	(0.05)**	2.07	(0.02)**
STDRET	−2.49	(0.01)***	−2.43	(<0.01)***
LAGROA	2.55	(0.01)**	2.62	(<0.01)***
LAGREV	0.09	(0.93)	1.30	(0.10)*
EARNCHG	0.99	(0.32)	1.59	(0.06)*
SGROWTH	−1.17	(0.24)	−1.82	(0.03)**
GW	2.76	(<0.01)***	4.36	(<0.01)***
PPE	−4.21	(<0.01)***	−6.52	(<0.01)***
SKEWRET	3.05	(<0.01)***	−3.08	(<0.01)***
CAR	0.40	(0.69)	0.38	(0.35)
NUMSEG	0.90	(0.37)	0.52	(0.30)
RECINV	3.72	(<0.01)***	4.57	(<0.01)***
REPORTLAG	−6.80	(<0.01)***	−6.85	(<0.01)***
ATENURE	3.16	(<0.01)***	3.68	(<0.01)***
CEOOWN	−1.44	(0.15)*	−4.35	(<0.01)***
OUTDIR	1.48	(0.14)*	2.70	(<0.01)***
BLOCK	−0.14	(0.89)	−0.32	(0.37)
BRDMEET	3.09	(<0.01)***	3.52	(<0.01)***

Column (1) presents the results of testing whether the mean values from the group of firms with D&O insurance are significantly different from the group of firms without D∗O insurance. Column (2) presents the results of the Wilcoxon test for the difference in medians across the two groups. Positive (negative) value imply the values for the group with (without) D&O coverage are larger. Variable definitions are in Appendix A.

* Significance at the 10% level, using one-tailed tests.
** Significance at the 5% level, using one-tailed tests.
*** Significance at the 1% level, using one-tailed tests.

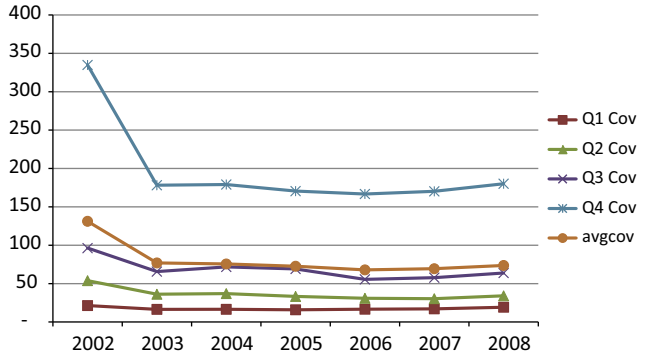

Fig. 1. Average D&O insurance coverage limits by quartile (2002–2008).

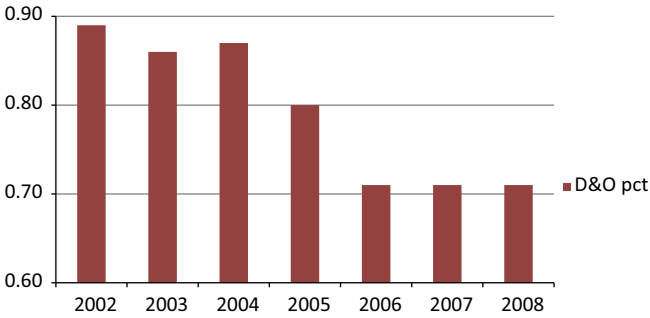

Fig. 2. Percentage of observations with D&O insurance (2002–2008).

that were merged, acquired, delisted, or went bankrupt. Based on firms' listing status in CRSP, we delete 107 firm-years (7 firms) that change cross-listing status during a fiscal year. We also delete 1130 firm-years (205 firms) whose financials are not available in the annual Compustat fundamental file. Further, we remove firm-years whose D&O coverage limits, governance data, and audit fees are unavailable in a proxy circular.[18] The final sample consists of 938 firm-years representing 266 individual firms.

3.3. Descriptive statistics

Figs. 1 and 2 show how D&O insurance limits and percentage of firms purchasing D&O change over the sample period. Fig. 1 shows the dynamics of average D&O insurance coverage limits (by quartile) over the sample period. In 2003, the average coverage limits purchased declined sharply and stabilized thereafter.[19] Fig. 2 shows the percentage of firm-year observations in the sample, by year, for which D&O insurance is purchased. The figure shows a decrease in D&O insurance purchases in the latter half of the sample period.

[18] When firms state in their proxy circulars that they carry D&O insurance but do not reveal the amount, D&O coverage limits are treated as missing. When a proxy circular does not mention D&O insurance, we assume that the firm does not carry any D&O insurance.

[19] As a robustness test, we drop observations from 2003. Doing so does not alter our results qualitatively and our inferences remain unchanged.

Table 1, Panel B, presents descriptive statistics for the full sample of 938 firm-years. The mean value of audit fees of sample firm-years is $2.19 million. The distribution is right-skewed as the mean value is substantially greater than the median value of $0.86 million.[20] The sample firms also have an average D&O coverage limit of $58.60 million. The mean sum of receivables and inventory (RECINV), which is used as a proxy for inherent risk, is about 22% of total assets, and the mean debt ratio (DEBT) is about 21% of total assets. The average percentage of shares held by the CEO is about 3%, while roughly 82% of board members are outside directors, on average. The average number of board meetings per year is 9.48, ranging from a minimum of 3 to a maximum of 25. The sample includes 202 firm-years (22%) in which the CEO is also the chairman of the board of directors. The sample is composed of 465 firm-years (50%) that are cross-listed in the U.S. and 473 local firm-years. In addition, 94% of the sample employs a Big 4 auditor.

A majority of sample firm-years (78%) carry D&O insurance. For comparison purposes, the descriptive statistics for firm-years with and without D&O insurance are presented in Panels C and D, respectively. On average, the D&O firms tend to be larger, pay higher audit fees, and pose a greater inherent audit risk (DEBT, RECINV). The extent of earnings management (PMDA) and the external monitoring by outside blockholders (BLOCK) across two sub-samples are similar. On average, the firms without D&O insurance have higher growth prospects as captured by MTB and are somewhat more risky (STDRET). The *t*-tests and the nonparametric Wilcoxon tests in Panel E show the differences in many of the sample variables are significantly different at the conventional significance levels between firms with and without D&O insurance.

4. Empirical results

4.1. Determinants of D&O coverage limits and purchase decisions

Table 2, Column 1 reports the ordinary least square estimation of Eq. (1) which regresses the natural log of D&O coverage limits on its determinants. All *t*-statistics reported in all the tables are based on standard errors clustered by firm and year. The residuals from this model comprise the excess coverage variable (EXCOV).[21] As expected, firm size is positively associated with coverage limits (*t*-statistic = 2.27). The results show that profitable firms and firms in high-tech industries purchase D&O insurance with significantly higher coverage limits, while firms with CEOs who are also the board chairperson have lower coverage limits.

The results of the probit regression on the D&O coverage purchase decision are reported in Column 2 of Table 2. This regression is the first-stage estimation of Eq. (2) in the Heckman procedure and the results are used to compute the inverse Mills ratio (MILLS). The Chi-squared statistic (144) indicates that the model has reasonably good fit. The results from the purchase decision analysis are generally consistent with the coverage limits analysis presented in Column 1, although firms with more frequent board meetings are more likely to purchase D&O insurance. Specifically, firms are significantly more likely to purchase D&O insurance when they are larger, more profitable, and in high-tech industries. The results indicate that firms are significantly less likely to purchase D&O insurance when the CEO is also the board chairperson.

4.2. Association between managerial opportunism and audit fees

Table 3 presents second-stage estimation results where we regress audit fees on excess D&O coverage (EXCOV), control variables, and the inverse Mills ratio (MILLS) obtained from the probit estimation of the coverage purchase decision (reported in Table 2, Column 2). The results of the full model

[20] The currency in this paper is Canadian dollars, unless otherwise stated. For firms reporting D&O insurance coverage in U.S. dollars, the average exchange rate over the fiscal year is used to convert U.S. dollars into Canadian dollars. The average exchange rate during the sample period was 0.78 U.S. dollars for one Canadian dollar.

[21] Note that we include observations with coverage limits of zero (i.e., did not purchase D&O insurance) as such firms have less coverage than would be expected given their economic characteristics. In untabulated robustness tests, the results are qualitatively similar to our tabulated results when we exclude firms without coverage from the coverage limits model and the audit fee model.

Table 2
Estimating D&O coverage limits and purchase decisions.

Independent variables	(1) Dependent variable = D&O coverage limits		(2) Dependent variable = Prob (PURCHASE = 1)	
	Coefficient	(*t*-statistic)	Coefficient	(χ^2)
SIZE	0.77	(2.27)**	0.11	(7.79)***
MTB	−0.14	(−0.89)	−0.02	(0.65)
DEBT	1.74	(0.75)	0.45	(1.69)
STDRET	0.03	(0.09)	–	
LAGROA	5.16	(2.31)**	1.01	(6.97)***
ACQDIVEST	–		−0.05	(0.19)
HIGHTECH	1.92	(1.35)*	0.48	(5.23)**
REGULATED	−1.25	(−0.72)	−0.31	(1.77)
LAGREV	−0.04	(−0.04)	–	
CROSS	1.12	(1.19)	0.18	(2.34)
CEOOWN	−1.80	(−0.33)	−0.25	(0.13)
CEOCHAIR	−2.02	(−1.58)*	−0.43	(10.80)***
OUTDIR	0.92	(0.24)	0.02	(0.00)
BLOCK	1.85	(0.58)	0.15	(0.08)
BRDMEET	0.10	(1.25)	0.02	(2.79)*
PMDA	0.04	(0.03)	−0.02	(0.01)
N	938		938	
Industry and year effects	Included		Included	
Model fit	Adj. R^2 = 0.15		χ^2 = 144 (*p*-value < 0.01)	

Column 1 reports the results on the ordinary least square estimation of Eq. (1) where the dependent variable the natural log of D&O coverage limits. Column 2 reports the results of the probit regression of Eq. (2) where the dependent variable, PURCHASE, is an indicator variable equal to 1 if the firm purchased D&O insurance for the fiscal year, and 0 otherwise. Other variable definitions are in Appendix A. The *t*-statistics for the coverage model in Column 1 are based on standard errors clustered by firm and year.

* Significance at the 10% level, using one-tailed tests.
** Significance at the 5% level, using one-tailed tests.
*** Significance at the 1% level, using one-tailed tests.

are presented in Column A. The explanatory variable of interest, EXCOV, is significantly positive at the 1% significance level (*t*-statistic = 3.35).[22] This result indicates that firm's with D&O coverage limits beyond (less than) the amounts indicated by the economic determinants of coverage limits tend to pay higher (lower) audit fees than similar firms without excess D&O coverage.[23] As such, this result provides evidence supporting hypothesis H1 and indicates that managerial opportunism, as incrementally reflected in excess D&O coverage limits, is a significant determinant of audit pricing.[24]

The coefficient on performance-matched discretionary accruals (PMDA) is also positive and significant (*t*-statistic = 2.46), which indicates that higher levels of discretionary accruals are associated with higher audit fees. To the extent that PDMA also captures managerial opportunism, this result also supports the idea that auditors incorporate information about expected managerial opportunism in audit fees.

The results for the other statistically significant control variables are generally consistent with prior literature. Specifically, the results show that firm size (SIZE), operational complexity (NUMSEG), inherent risk (RECINV), leverage (DEBT), stock return volatility (STDRET), cross-listing status (CROSS),

[22] Following Core (1997) and Chung and Wynn (2008), we estimate an alternative specification where we replace EXCOV with the level of coverage limits in Eq. (3). In untabulated results, the coefficient on coverage is significantly positive at the 1% significance level, and the overall results are consistent with those in Table 3.

[23] Our evidence complements and extends O'Sullivan (2009). Using one year of UK data and not controlling for self-selection, he finds a positive association between audit fees and whether a firm purchased D&O insurance.

[24] Including the corporate governance related variables causes a reduction in sample size from 1189 to 938. As a robustness test, we exclude these variables and rerun the audit fee model on the larger sample. Untabulated results show that the *EXCOV* coefficient remains positive and is significant at the 0.1% level.

Table 3
Association between managerial opportunism and audit fees.

Dependent variable = AUDITFEE							
Independent variables		(A)		(B)		(C)	
		Coef.	(*t*-statistic)	Coef.	(*t*-statistic)	Coef.	(*t*-statistic)
EXCOV	+	0.02	(3.35)***				
IVPREDCOV	+			0.02	(3.34)***		
IVEXCOV	+					0.01	(1.87)**
PMDA	+	0.21	(2.46)***	0.21	(2.38)***	0.21	(2.27)**
CEOOWN	+	−0.37	(−0.89)	−0.31	(−0.80)	−0.35	(−0.81)
CEOCHAIR	+	0.03	(0.34)	0.07	(0.70)	0.03	(0.28)
OUTDIR	+	−0.59	(−1.83)**	−0.59	(−1.72)**	−0.61	(−1.87)**
BLOCK	?	0.30	(0.91)	0.25	(0.77)	0.29	(0.90)
BRDMEET	+	0.03	(5.02)***	0.03	(4.79)***	0.03	(4.91)***
PROBLIT	+	−0.07	(−0.20)	−0.10	(−0.27)	−0.04	(−0.10)
SIZE	+	0.55	(20.35)***	0.53	(18.33)***	0.55	(20.2)***
NUMSEG	+	0.04	(1.87)**	0.04	(1.93)**	0.04	(1.58)*
RECINV	+	0.47	(1.79)**	0.49	(1.90)**	0.47	(1.77)**
FOREIGN	+	0.00	(0.00)	−0.01	(−0.08)	−0.01	(−0.12)
LOSS	+	−0.03	(−0.34)	−0.03	(−0.31)	−0.03	(−0.38)
DEBT	+	0.61	(2.44)***	0.59	(2.40)***	0.62	(2.46)***
STDRET	+	0.04	(1.75)**	4.07	(2.02)**	3.80	(1.64)*
MTB	+	0.01	(0.48)	0.01	(0.80)	0.00	(0.41)
FIN	–	−0.21	(−0.68)	−0.22	(−0.73)	−0.20	(−0.63)
UTIL	–	−0.22	(−1.15)	−0.24	(−1.21)	−0.19	(−1.06)
CROSS	+	0.60	(5.08)***	0.58	(4.86)***	0.61	(4.99)***
BIG4	+	0.03	(0.26)	0.03	(0.23)	0.02	(0.19)
ΔAUDITOR	–	0.12	(0.42)	0.09	(0.31)	0.12	(0.42)
REPORTLAG	+	0.33	(1.63)*	0.32	(1.68)**	0.29	(1.33)*
NONAUDIT	+	0.16	(1.50)*	0.18	(1.74)**	0.17	(1.68)**
ATENURE	–	−0.01	(−1.27)	−0.01	(−1.17)	−0.01	(−1.23)
SPECIALIST	+	0.67	(2.48)***	0.66	(2.32)**	0.71	(2.66)***
MILLS	?	0.16	(0.45)	0.22	(0.62)	0.17	(0.47)
N		938		938		938	
Industry and year effects		Included		Included		Included	
Adjusted R^2		0.78		0.77		0.77	

Results are for the estimation of Eq. (3). The dependent variable is the natural logarithm of annual audit fees, AUDITFEE. IVPREDCOV is the predicted coverage level using an instrumental variables approach where the industry median D&O coverage ratio is included in Eq. (1) as an exogenous instrument for the firm's D&O coverage limits. IVEXCOV are the residuals from the regression used to estimate IVPREDCOV. Other variable definitions are in Appendix A. The *t*-statistics are based on standard errors clustered by firm and year.

* Significance at the 10% level, using one-tailed tests.
** Significance at the 5% level, using one-tailed tests.
*** Significance at the 1% level, using one-tailed tests.

auditor specialist (SPECIALIST), and board diligence (BRDMEET) are all significantly associated with higher audit fees. Carcello et al. (2002) find a positive association between the percentage of outside directors and audit fees, which they interpret as indicating that independent boards demand high-quality audit services. However, in contrast with their findings, we find that the OUTDIR coefficient is significantly negative (*t*-statistic = −1.83). A possible explanation for this result is that more independent directors serve to reduce audit risk, and hence, audit fees. This finding is consistent with a risk-based explanation of audit pricing.

Finally, we note that the coefficient on the estimated litigation risk variable, *PROBLIT*, is not significantly different from zero. We expect this is due to the inclusion of several of the important determinants of litigation risk from Eq. (4) as independent variables in the audit fee model. To examine this possibility, we reran the audit fee model (Eq. (3)) where we included *PROBLIT* but excluded all of the litigation risk explanatory variables from Eq. (4) that were also included in Eq. (2). In untabulated results, the EXCOV coefficient continues to be positive and significant (*t*-statistic = 4.07). In addition, the coefficient on *PROBLIT* is now positive and highly significant (*t*-statistic = 4.90), as expected.

4.2.1. Endogeneity

Given that both the decision to purchase D&O insurance and the coverage amounts represent choices made by firms, potential endogeneity is a source of concern regarding the validity of our findings. Our two-stage methodology should help alleviate self-selection concerns, and our use of an extensive set of control variables should further help reduce concerns about omitted variables. It is still possible that firms with excess D&O coverage have firm-specific characteristics omitted from our models that affect both the excess coverage decision and audit fees. Accordingly, we perform additional tests based on an instrumental variable (IV) approach to provide additional assurance in this regards.

Following the recent literature (Adams et al., 2011; Lin et al., 2011a), we use the industry median D&O coverage ratio as an exogenous instrument for the firm's D&O coverage limits. Firms in the same industry likely compete for the same pool of managerial talent. In order to compete effectively, compensation packages (e.g., including D&O insurance coverage) need to be comparable to those offered by industry competitors (Adams et al., 2011). In addition, firms in the same industry face similar business conditions, including audit risk and litigation risk. As a result, industry median coverage will be correlated with a firm's D&O insurance coverage but is unlikely to directly influence the firm's audit fees except through the firm's D&O coverage (Lin et al., 2011a).

To implement this approach, we include the industry median D&O coverage limit (based on 4-digit SIC codes) as an additional explanatory variable in the coverage limits model (Eq. (1)). In untabulated results, the coefficient on the instrumental is positive and highly significant, as expected. We then take two complementary approaches. First, following Adams et al. (2011) and Lin et al. (2011a), we use the results from this augmented regression to determine the predicted level of D&O coverage (*IVPREDCOV*). Second, we calculate the excess coverage variable (*IVEXCOV*) based on the residuals from this augmented variable, as before.

We then re-estimate the audit fee model (Eq. (3)) first using *IVPREDCOV* in place of EXCOV and second, using *IVEXCOV* in place of *EXCOV*. The results from the instrumental variable regressions are reported in Table 3, Columns B and C, respectively. The results in Column B indicate that *IVPREDCOV* is positive and highly significant (t-statistic = 3.34), suggesting that firms with higher levels of predicted coverage have higher audit fees after controlling for other determinants of audit fees. The results in Column C show that *IVEXCOV* is also positive and significant at the 5% level (t-statistic = 1.87). Thus, our main finding that D&O coverage is positively associated with audit fees is robust to our instrumental variables approach, and thus, it is less likely that it is driven by, or sensitive to, endogeneity concerns. In addition, the coefficients on the control variables in Columns B and C are generally consistent with those reported in Column A.

4.2.2. An alternative approach using abnormal audit fees

While a large number of papers have examined hypotheses relating to audit fees following the same basic single-stage approach above (see Hay et al., 2006 for a review), some recent papers (e.g., Choi et al., 2010; Hribar et al., 2014) have employed two-stage approaches where they first regress total audit fees on a reduced set of explanatory variables, and then use the residuals from the first-stage regression, which are labeled "Abnormal Audit Fees" in some second stage analysis. For example, Hribar et al. (2014) regress audit fees on non-quality related determinants of audit fees to isolate the portion of audit fees related to accounting quality.

In order to ensure the robustness of our results, we follow a similar approach. We first modify Eq. (3) by excluding EXCOV, PMDA, ΔAUDITOR, REPORTLAG, NONAUDIT, ATENURE, CEOOWN, CEOCHAIR, OUTDIR, BLOCK, BRDMEET, and MILLS. The results of this regression are reported in Table 4, Panel A. The coefficient magnitudes and significance levels are very similar to those in Table 3.

In the second stage, we label the residuals from this regression as abnormal audit fees (ABAUDITFEE) and regress them on the excluded variables. As additional tests, we also run specifications where we replace our variable on interest, EXCOV, with one of the two instrumental variables discussed above, IVPREDCOV and IVEXCOV. The results are reported in Panel B of Table 4. To conserve space, we only report the results for the coverage variable of interest. In all three columns, the results strongly show that excess coverage is positively associated with abnormal audit fees. Thus, our results are consistent with those in Table 3.

Table 4
Association between managerial opportunism and abnormal audit fees.

Dependent variable = AUDITFEE			
Independent variables		Coef. (*t*-statistic)	
Panel A: First stage of audit fee model			
PROBLIT	+	0.20	(0.61)
SIZE	+	0.53	(22.56)***
NUMSEG	+	0.03	(1.31)*
RECINV	+	0.53	(1.91)**
FOREIGN	+	−0.02	(−0.24)
LOSS	+	0.02	(0.28)
DEBT	+	0.70	(3.01)***
STDRET	+	0.05	(2.53)***
MTB	+	0.00	(0.41)
FIN	−	−0.21	(−0.68)
UTIL	−	−0.27	(−1.45)*
CROSS	+	0.57	(4.98)***
BIG4	+	−0.06	(−0.52)
SPECIALIST	+	0.65	(2.11)**
N		938	
Industry and year effects		Included	
Adjusted R^2		0.75	

Dependent variable = ABAUDITFEE							
Independent variables		(A)		(B)		(C)	
		Coef.	(*t*-statistic)	Coef.	(*t*-statistic)	Coef.	(*t*-statistic)
Panel B: Results using abnormal audit fees							
EXCOV	+	0.02	(3.43)***				
IVPREDCOV	+			0.02	(3.44)***		
IVEXCOV	+					0.01	(1.85)**
Other controls		Included		Included		Included	
N		938		938		938	
Adjusted R^2		0.07		0.07		0.06	

Panel A: Results are for the estimation of Eq. (3) with certain variables excluded. The dependent variable is the natural logarithm of annual audit fees, AUDITFEE. The *t*-statistics are based on standard errors clustered by firm and year. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively, using one-tailed tests.
Panel B: Results are for the estimation of the estimation of abnormal audit fees, ABAUDITFEE, on the other variables from Eq. (3) that are not included in the Panel A regression. The results from the control variables are omitted for brevity. IVPREDCOV is the predicted coverage level using an instrumental variables approach where the industry median D&O coverage ratio is included in Eq. (1) as an exogenous instrument for the firm's D&O coverage limits. IVEXCOV are the residuals from the regression used to estimate IVPREDCOV. Other variable definitions are in Appendix A. The *t*-statistics are based on standard errors clustered by firm and year.
* Significance at the 10% level, using one-tailed tests.
** Significance at the 5% level, using one-tailed tests.
*** Significance at the 1% level, using one-tailed tests.

Interestingly, Hribar et al. (2014) and Choi et al. (2010) interpret their evidence on the negative association between abnormal audit fees and accounting quality in opposite ways. While Hribar et al. (2014) surmise that lower accounting quality drives higher audit fees as auditors seeks to mitigate the effects of lower quality, Choi et al. (2010) view abnormal audit fees as driving lower quality because the excess fees reduce auditors' incentives to deter biased financial reporting. Regardless of which way the causality runs, the interpretation of our results remains the same: excess D&O coverage is positively associated with (abnormal) audit fees because they reflect auditors' private information about the likelihood of managerial opportunism, and this opportunism results in lower accounting quality. Thus, the findings in Hribar et al. (2014) and Choi et al. (2010) help strengthen our interpretation that the positive association between EXCOV and (abnormal) audit fees is driven by auditors' private information about managerial opportunism.

Table 5
Audit fees and excess coverage – Split sample analyses.

Dependent variable = AUDITFEE		
	High discretionary accruals	Low discretionary accruals
Panel A: High vs. low discretionary accruals		
EXCOV	0.02***	0.00
	(3.81)	(0.55)
N	235	235
Adj. R^2	0.75	0.74
F-stat (*p*-value)	5.84 (0.02)	
	High outside directors	Low outside directors
Panel B: High vs. low outside directors		
EXCOV	0.00	0.04**
	(0.23)	(3.32)
N	197	247
Adj. R^2	0.84	0.73
F-stat (*p*-value)	10.14 (<0.01)	
	High volatility	Low volatility
Panel C: High vs. low volatility		
EXCOV	0.02**	0.00
	(2.21)	(0.01)
N	188	188
Adj. R^2	0.70	0.83
F-stat (*p*-value)	2.10 (0.15)	

Results are for the estimation of Eq. (3). The dependent variable is the natural logarithm of annual audit fees, AUDITFEE. Each panel presents the summary results from estimating Eq. (3) on two sub-samples. For the sake of brevity, only the results for EXCOV are reported. In Panel A, the High (Low) Discretionary Accruals subsample consists of the top (bottom) quartiles of observations ranked on the value of performance matched discretionary accruals (PMDA). In Panel B, the High (Low) Outside Directors subsample consists of the top (bottom) quartiles of observations ranked on the value of OUTDIR, the percentage of directors who are classified as outsiders. In Panel C, the High (Low) Volatility subsample consists of the top (bottom) quintiles of observations ranked on the value of lagged equity volatility. Variable definitions are in Appendix A. The *t*-statistics are based on standard errors clustered by firm and year. *F*-stat based on testing the null hypothesis that the two EXCOV coefficients are equal.
* Significance 10% level, using one-tailed tests.
** Significance at the 5% level, using one-tailed tests.
*** Significance at the 1% level, using one-tailed tests.

4.2.3. Cross-sectional tests

In this section, we report the results of tests designed to provide additional evidence regarding the cross-sectional variation in the association between managerial opportunism and audit fees. We expect that auditors' pricing decisions are more (less) sensitive to excess D&O coverage when such coverage is more (less) likely to result in opportunistic actions. Specifically, we predict that directors and officers are more likely to respond opportunistically to the legal shield provided by excess D&O coverage when (1) discretionary accruals are high, (2) when there are fewer outside directors, and (3) when equity volatility is high. The results for the *EXCOV* coefficients and corresponding *t*-statistics are presented in Table 5.

We expect auditors will be more sensitive to excess D&O coverage when firms have relatively high levels of discretionary accruals since the presence of high discretionary accruals indicates that managers are more predisposed to act opportunistically. To examine this possibility, we partition the sample into quartiles based on the level of discretionary accruals (PMDA). We then estimate the audit fee model (Eq. (3)) separately on the top and bottom quartiles. The results presented in Panel A show that while the *EXCOV* coefficient is positive and significant (*t*-statistic = 3.81) when discretionary accruals are high, it is not significantly different from zero when discretionary accruals are low. An *F*-test rejects the null hypothesis that the two coefficients are equal (*p*-value = 0.02). These findings indicate auditors are more concerned about managerial opportunism at firms that manage their earnings to a greater extent.

Our next partition is based on the degree of board independence measured as the percentage of directors who are outsiders. If more independent directors are associated with greater internal monitoring, then we expect auditors will be less sensitive to managers' opportunistic incentives captured by excess D&O coverage. To provide evidence on this issue, we separately run Eq. (3) on the top and bottom quartiles and report the results in Panel B.[25] The results are consistent with our expectations as the *EXCOV* coefficient is positive and significant (*t*-statistic = 3.32) for the low outside director sample while it is not significant in the high outside director sample. An *F*-test rejects the null hypothesis that the two coefficients are equal (*p*-value = <0.01). These results are consistent with auditors acting as if more effective internal monitoring can counteract D&O insurance-based incentives.[26]

Our final partition is based on equity volatility. Lin et al. (2013) find that D&O insurance coverage is positively associated with loan spreads, which they attribute to such firms being more risky due to increased moral hazard and/or information asymmetry. Accordingly, we expect auditors will be more sensitive to excess D&O coverage when firms are more volatile. To examine this possibility, we partition the sample based on standard deviation of equity returns measured over the previous year. We then separately estimate Eq. (3) on the two partitions and report the results in Panel D. Consistent with our expectations, the *EXCOV* coefficient is positive and significant (*t*-statistic = 2.21) for the high volatility sample, while it is not significant in the low volatility sample. An *F*-test marginally rejects the null hypothesis that the two coefficients are equal (*p*-value = 0.15). Together, the results presented in Table 5 suggest that auditors are more sensitive to potential managerial opportunism when managers are more likely to act on their opportunistic D&O coverage incentives.[27]

4.3. Association between managerial opportunism and litigation risk

As discussed above, we expect auditors to charge higher audit fees to firms with higher managerial opportunism both because they employ more (and more expensive) audit resources to audit these firms as well as to compensate them for higher litigation risk. The results above strongly support our hypothesis that managerial opportunism (proxied by excess coverage) and audit fees are positively associated. In this section, we provide additional evidence on this relation by directly examining the association between excess insurance coverage and litigation risk, which is a determinant of audit fees (Simunic, 1980).[28]

Table 6, Column A presents the results from the estimation of Eq. (4). Consistent with hypothesis H2, the coefficient on EXCOV is positive and significant at the 5% level. This finding suggests that one reason why audit firms charge higher fees to firms with higher levels of excess coverage is that these firms are more likely to be sued by their shareholders. To the extent their auditors are named as co-defendants (in accordance with the deep-pockets theory of auditor litigation), our finding suggests that at least part of the higher audit fee represents a litigation risk premium. As such, it provides further support for hypothesis H1.

The results in Column A show that when EXCOV is included in the regression, PDMA is not significant at conventional levels. This finding suggests that excess D&O coverage is a better proxy for litigation risk than discretionary accruals are. To provide more evidence on this issue, we run two additional specifications where we alternatively exclude PDMA and EXCOV from the model. When PMDA is excluded, the significance level of the EXCOV coefficient slightly increases, but the magnitude of the EXCOV coefficient and model fit remains unchanged. When EXCOV is excluded, the magnitude

[25] The number of observations differs somewhat from Panel A due to the semi-discrete nature of *OUTDIR*.

[26] This conclusion regarding the association between corporate governance and opportunistic behavior is consistent with that in Boyer and Stern (2012).

[27] As discussed in Rajan and Zingales (1998), one way to alleviate endogeneity concerns is to focus on the theoretical channels through which independent variables affect the dependent variable. The evidence presented in this section could be interpreted in this light as they indicate not only whether but how excess D&O insurance coverage is associated with audit fees: when managers are more likely to respond to the opportunistic incentives inherent in excess D&O coverage. To this extent, the results reported in Table 5 help reduce concerns about endogeneity in our setting.

[28] This analysis is narrower in scope because it focuses on only one aspect of managerial opportunism that affects audit fees, namely the probability of litigation. As such, it ignores other aspects that also affect audit fees, including the magnitude of damages given litigation and firm characteristics that result in higher audit costs (more hours and/or more experienced staff).

Table 6
Association between managerial opportunism and litigation risk.

Dependent variable = Prob(LITIGATION = 1)					
Variables	Expected sign	(A)		(B)	
		Coef.	(χ^2)	Coef.	(χ^2)
EXCOV	+	0.08	(4.10)**	−0.01	(0.01)
HIGHAF	?	–		−2.69	(8.36)***
EXCOV * HIGHAF	+	–		0.79	(19.48)***
PMDA	+	0.73	(0.83)	0.80	(0.84)
SIZE	+	0.35	(6.10)**	0.75	(13.22)***
CROSS	+	1.83	(8.28)***	2.33	(10.89)***
LEV	+	−0.79	(0.47)	0.84	(0.45)
MTB	+	0.08	(1.43)	0.17	(6.21)**
EARNCHG	+	0.00	(0.22)	0.00	(0.35)
SGROWTH	+	0.30	(1.13)	0.15	(0.03)
GW	+	−0.10	(0.00)	0.70	(0.21)
PPE	–	−0.59	(0.97)	−0.65	(0.92)
STDRET	+	0.66	(16.96)***	0.70	(17.06)***
SKEWRET	+	0.02	(0.01)	0.12	(0.67)
CAR	–	0.58	(1.78)	0.71	(2.10)
EQISSUE	+	0.59	(1.34)	0.43	(0.68)
DISSUE	+	0.04	(0.01)	0.02	(0.00)
NYSE	+	0.18	(0.08)	−0.19	(0.07)
CEOOWN	+	1.96	(0.53)	1.01	(0.10)
CEOCHAIR	+	1.74	(12.94)***	1.27	(5.47)**
OUTDIR	–	5.67	(5.45)**	5.78	(4.70)**
BLOCK	+	2.17	(1.31)	1.88	(0.86)
HIGHTECH	+	0.55	(0.68)	0.69	(0.75)
N		938		938	
Industry and year effects		Included		Included	
Model fit		χ^2 = 111 (*p*-value < 0.01)		χ^2 = 129 (*p*-value < 0.01)	
F-statistic (EXCOV + EXCOV * HIGHAF = 0)				19.0 (*p*-value < 0.0001)	

Results for the estimation of Eq. (4) are presented in Column A. The results of an augmented version of Eq. (4) are presented in Column B, where HIGHAF and HIGHAF * EXCOV are added to the model. HIGHAF is an indicator variable that takes on a value of one if the firm's annual audit fees are above the sample median. The dependent variable is LITIGATION, which is an indicator variable that takes on the value of one if the firm was a defendant in a class action securities lawsuit over the next 4 years, and zero otherwise. The *t*-statistics are based on standard errors clustered by firm and year.
* Significance at the 10% level.
** Significance at the 5% level.
*** Significance at the 1% level.

and significance level of PMDA coefficient increases, but remains statistically insignificant. Moreover, the model fit statistic declines from 111 to 100. Overall, these untabulated results suggest that EXCOV is a stronger predictor of litigation risk compared to discretionary accruals and that the conventional audit risk model using discretionary accruals may not be fully capturing auditor pricing behavior with respect to managerial opportunism.

In Column B, we present the results where *EXCOV* is interacted with *HIGHAF* in the litigation risk model, where *HIGHAF* is an indicator variable that equals one when audit fees are above the median level, and zero otherwise. We expect the interaction coefficient to be positive as it captures instances where both signals (high audit fees and excess D&O coverage) indicate higher litigation risk. As expected, the *EXCOV * HIGHAF* coefficient is positive and significant at the 1% level. However, the *EXCOV* coefficient itself is not significantly different from zero. An *F*-test strongly rejects the null hypothesis that the sum of the EXCOV and EXCOV * HIGHAF equals zero (*p*-value < 0.0001). These results indicate that the association between managerial opportunism on future litigation risk is limited to firms with higher audit fees. Finally, the *HIGHAF* coefficient is negative and significant. This

result is consistent with higher audit fees corresponding in part to higher audit quality, which in turn lowers litigation risk.

5. Conclusion

Directors' and officers' (D&O) legal liability insurance is commonly provided to executives and directors. We expect disclosures regarding D&O policies are incrementally useful in assessing the degree of managerial opportunism since managers are more willing to engage in opportunistic behaviors when their personal assets are (more) protected from litigation risk by D&O insurance. We provide evidence on the potential usefulness of this type of compensation disclosure for capital market participants by examining the association between excess D&O coverage limits and audit fees (litigation risk). Audit fees reflect auditors' private information about managerial opportunism. We use excess D&O coverage limits (i.e., the amounts unexplained by the economic determinants of coverage limits) as a composite measure of managerial opportunism.

We test our hypothesis that external auditors charge higher fees for audit clients with excessively high legal liability insurance coverage using a sample of Canadian firms listed on the Toronto Stock Exchange between 2002 and 2008. We find a significantly positive association between excess coverage and audit fees, suggesting that auditors charge higher fees to firms whose managers are more likely to behave opportunistically. This finding is robust to using different methods, including an instrumental variables approach, to control for potential endogeneity. In addition, we find the association between excess D&O coverage and audit fees varies cross-sectionally in ways that are consistent with excess coverage capturing managerial opportunism. We also find a positive association between excess D&O coverage limits and shareholder litigation risk. Our results are consistent with auditors increasing audit effort and/or charging fee premiums in response to potential management wrongdoings. Our findings suggest that D&O insurance disclosures convey incrementally useful information to shareholders and other capital market participants about potential managerial opportunism beyond that contained in other publicly-available variables. Currently, U.S. firms are not required to disclose this information.

Our conclusions are subject to certain limitations and caveats. First, our estimation may include endogenous demand variables as independent variables, such as corporate governance attributes and litigation risk. For example, the baseline level of litigation risk is likely related to both audit fees and D&O coverage. If the baseline level of litigation risk is not fully controlled for in our estimation model, our findings could be due to it causing higher audit fees, rather than managerial opportunism. Although we take a number of steps to eliminate this possibility, including an instrumental variables approach, we cannot completely rule out the potential existence of omitted variables or the possible inclusion of endogenous demand variables. In addition, we do not control for auditors' reputation concerns. In addition to monetary concerns, reputation concerns would affect audit efforts and audit fees, especially in a competitive audit market. However, we expect that Big 4 auditors, employed by 94% of our sample, have roughly similar levels of insurance coverage and similar reputation concerns such that these influences are unlikely to bias our results.

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Appendix A

Variable definitions.

Variable	Source	Definition
ABAUDITFEE	SEDAR	Abnormal audit fees, the residuals obtained from the audit fee model (Eq. (3)) with certain variables excluded
ACQDIVEST	COMPUSTAT	Indicator variable that equals one if the book value of total assets at the end of the fiscal year increases or decreases by more than 25% during the fiscal year, and zero otherwise
ATENURE	COMPUSTAT	The number of years that the auditor is retained by the firm
AUDITFEE	SEDAR	The natural logarithm of annual audit fees
BIG4	COMPUSTAT	Indicator variable that equals one if the firm's auditor is one of the Big 4 audit firms, and zero otherwise
BLOCK	SEDAR	The percentage of ownership held by outside shareholders who individually own over 10% of the firm's stock
BRDMEET	SEDAR	The number of meetings that the board of directors held during a fiscal year
CAR	CRSP/TMX Datalink	Cumulative abnormal returns over prior year, based on equally weighted index returns for cross-listed firms and on S&P/TSX Composite index for all other firms
CEOCHAIR	SEDAR	Indicator variable that equals one if the CEO is also the chair of the board of directors, and zero otherwise
CEOOWN	SEDAR	The percentage of shares held by the Chief Executive Officer
CROSS	CRSP	Indicator variable that equals one if a firm is cross-listed in the U.S., and zero otherwise
DEBT	COMPUSTAT	The ratio of debt to total assets
DISSUE	COMPUSTAT	Indicator variable that equals one if the firm issues new long-term debt, and zero otherwise
EARNCHG	COMPUSTAT	The change in earnings measured as the difference between current year income and prior income, deflated by share price
EQISSUE	COMPUSTAT	Indicator variable that equals one if the firm issues new shares, and zero otherwise
EXCOV	SEDAR	The excess amount of D&O coverage estimated as the residual of Eq. (1)
FIN	COMPUSTAT	Indicator variable that equals one if a firm is in a financial (SIC codes 6000–6099, 6200–6299) industry, and zero otherwise
FOREIGN	COMPUSTAT	Indicator variable that equals one if a firm reports foreign current adjustments, and zero otherwise
GW	COMPUSTAT	Goodwill over lagged total assets
HIGHTECH	COMPUSTAT	Indicator variable that equals one if a firm is a member of the Pharmaceuticals (SIC codes 2833–2836), R&D Services (8731–8734), Programming (7371–7379), Computers (3570–3577), or Electronics (3600–3674) industries, and zero otherwise
LAGREV	COMPUSTAT	The natural logarithm of lagged sales revenue
LAGROA	COMPUSTAT	The lagged return on assets
LEV	COMPUSTAT	The ratio of total liabilities to stockholder's equity
LITIGATION	Lexis/Nexis	Indicator variable equal to one if the firm was a defendant in a class action securities lawsuit over the next 4 years, and zero otherwise
LNCOV	SEDAR	The natural logarithm of D&O coverage limits
LOSS	COMPUSTAT	Indicator variable that equals one if a client firm reports a loss in each of the past two years, and zero otherwise

Appendix A. (*continued*)

Variable	Source	Definition
MTB	COMPUSTAT	The ratio of the market value of equity to the book value of equity
NONAUDIT	SEDAR	Indicator variable that equals one if the firm purchases non-audit services from its auditor, and zero otherwise
NUMSEG	COMPUSTAT	The number of business segments
NYSE	COMPUSTAT	Indicator variable that equals one if the firm is listed on NYSE, and zero otherwise
OUTDIR	SEDAR	The percentage of outside directors on the board of directors
PMDA	COMPUSTAT	The performance-matched discretionary accruals defined as the difference between the firm-specific residual from the following model and the median firm-specific residual from the same two-digit SIC/ROA decile in year $t-1$: $ACCRUALS_t = \delta_1 CFO_{t-1} + \delta_2 CFO_t + \delta_3 CFO_{t+1} + \delta_4 \Delta REV_t + \delta_5 PPE_t + \varepsilon_t$, where ACCRUALS is earnings before extraordinary items minus cash flow from operations, CFO is cash flows from operations, ΔREV is the annual change in revenues, and PPE is gross property, plants, and equipment, all deflated by the lagged total assets
PPE	COMPUSTAT	Property, plant, and equipment over lagged total assets
PURCHASE	SEDAR	Indicator variable that equals one if the firm purchased D&O insurance coverage for the fiscal year, and zero otherwise
RECINV	COMPUSTAT	The sum of receivables and inventory, divided by total assets
REGULATED	COMPUSTAT	Indicator variable that equals one if a firm is a member of the Telephone (SIC codes 4812–4813), TV (4833), Cable (4841), Communications (4811–4899), Gas (4922–4924), Electricity (4931), Water (4941), or Financial (6021–6023, 6035–6036, 6141, 6311, 6321, 6331) industries, and zero otherwise
REPORTLAG	COMPUSTAT	The number of calendar days between the fiscal year-end date to the filing date of audit report, divided by 100
SGROWTH	COMPUSTAT	The sales growth from prior year
SIZE	COMPUSTAT	The natural logarithm of lagged total assets
SKEWRET	CRSP/TMX	The skewness of returns over prior year
SPECIALIST	COMPUSTAT	Indicator variable that equals one if the auditor's market share based on clients' total assets is the highest within the two-digit SIC industry group, and zero otherwise
STDRET	CRSP/TMX	The standard deviation of stock returns over the prior year
UTIL	COMPUSTAT	Indicator variable that equals one if a firm is in utilities (4900–4999) industries, and zero otherwise
ΔAUDITOR	COMPUSTAT	Indicator variable that equals one if a firm has an auditor change(s), and zero otherwise

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