



Corporate governance, directors' and officers' insurance premiums and audit fees

Hyeesoo H. Chung

*School of Accountancy, W.P. Carey School of Business,
Arizona State University, Tempe, Arizona, USA, and*

Jinyoung P. Wynn

*School of Accountancy and Information Systems, College of Business,
Louisiana Tech University, Ruston, Louisiana, USA*

Abstract

Purpose – This study aims to examine the association between corporate governance and audit fees using directors' and officers' (D&O) insurance premiums as a proxy for overall governance quality. The use of an overall governance measure that captures both structural and non-structural governance features may shed light on the association between governance and audit fees, which is known to be inconclusive in the literature.

Design/methodology/approach – The authors employ D&O insurance premiums as a proxy for governance quality that reflects both the structural features and non-structural features of governance. D&O insurance premiums are hand-collected from a proxy circular of Canadian firms. Multivariate regression analyses are used for testing.

Findings – The authors find a positive association between D&O premiums and audit fees, suggesting that auditors charge higher fees to firms with heightened corporate governance risk. Even after controlling for structural governance variables in the regression model, the authors find a significantly positive association between D&O premiums and audit fees.

Research limitations/implications – The findings suggest that mandatory disclosures of D&O insurance policies can be useful for market participants. This study uses a relatively small sample of Canadian firms. A larger sample could strengthen the implications of the findings.

Originality/value – The findings suggest that structural features of governance may be insufficient to provide a full understanding of the impact of corporate governance on audit pricing and add to the understanding of the determinants of audit fees.

Keywords Corporate governance, Audit fees, Directors' and officers' legal liability insurance

Paper type Research paper

1. Introduction

This study examines the association between corporate governance and audit fees using directors' and officers' (D&O) insurance premiums as a proxy for overall governance quality. The use of an overall governance measure that captures both structural and non-structural governance features may shed light on the inconclusive association between



JEL classification – G32, K22, M42

The authors appreciate the helpful comments from the two anonymous reviewers, Lucy Huajing Chen, Kenneth Ferris, Steve Kaplan, and Han Yi. Jinyoung P. Wynn is grateful for financial support from the Max P. Watson, Jr Endowed Professorship that is made available through the State of Louisiana Board of Regents Support Funds.

governance and audit fees. Prior studies document mixed evidence on the association, supporting risk-based or demand-based audit pricing (Tsui *et al.*, 2001; Carcello *et al.*, 2002; Abbott *et al.*, 2003; Mitra *et al.*, 2007). A risk-based perspective argues that if external auditors cannot rely on firms' corporate governance to ensure the quality of financial reporting, they may increase audit efforts and/or charge additional fees to compensate for increased work or potential litigation risk. On the other hand, a demand-based perspective argues that strong governance demands companies to purchase high-quality audit services to reduce the likelihood of fraudulent financial reporting, which increases audit fees.

Core (2000) finds that a firm's D&O insurance premium is significantly associated with proxies for the quality of governance structure, suggesting that the premium is a useful summary measure of outside assessment for governance quality and *ex ante* litigation risk. The result may be attributable to the extensive D&O insurance application process requiring written details on the firm's litigation history, business activities, biographical information on its D&O, ownership structure and prior knowledge of acts or omissions likely to give rise to a claim (Knepper and Bailey, 1993; Baker and Griffith, 2007). Through in-depth interviews, Baker and Griffith (2007) report that the D&O underwriters' assessment emphasises the firm's underlying structure of incentives and constraints, rather than the presence or absence of formal governance mechanisms. Moreover, the D&O underwriters' efforts are primarily focused on understanding the non-structural governance features.

This study employs the D&O insurance premium as a proxy for overall governance quality, focusing on understanding the role of non-structural aspects of corporate governance that have been overlooked in the audit fee literature[1]. In a survey of external auditors on the role of corporate governance in the audit process, Cohen *et al.* (2002) report that all participants overwhelmingly upheld management credibility as the most important factor to consider when evaluating governance quality. They also report that governance framework is inextricably intertwined with managers' attitudes toward governance, with the senior management setting the tone for governance within a company. Their report implies that any good corporate governance framework could not translate into effective practices unless corporate culture promotes and facilitates such practices. Likewise, the structural features of governance alone might be insufficient to fully understand the role and impact of corporate governance in audit pricing. Thus, the D&O premium has advantages over the structural measures commonly used in the literature, since it is an external assessment of overall governance quality that considers both structural and non-structural features of governance.

Using the D&O insurance premium of Canadian firms, we find a positive association between D&O premiums and audit fees, suggesting that auditors charge higher fees to firms with a heightened corporate governance risk. This positive association between D&O premiums and audit fees hold even after controlling for structural features of governance. This result suggests that non-structural features of governance are incrementally associated with auditors' private information about audit risk and litigation risk. Our findings are robust to the selection bias and endogeneity.

This paper contributes to the literature on the link between corporate governance and audit fees by providing empirical evidence on a determinant that has been overlooked in prior studies. We find that the D&O insurance premium as an overall governance measure explains audit fees in addition to the structural governance variables,

suggesting that external auditors also consider the non-structural aspects of governance in their risk assessments. Our study has several implications. First, researchers should carefully consider both structural and non-structural features of governance when examining the corporate governance effects on various decision outcomes. Second, the US policy-makers should consider mandating disclosures of D&O insurance policies. D&O premium details can be used by market participants to assess the governance risk of firms, especially as a measure of non-structural governance risk that are unobservable to the public. In addition, as Griffith (2006) points out, a public disclosure of D&O insurance premiums could have incentive effects for firms to improve their governance quality. If the governance quality inferred from the D&O premium is used by investors to adjust their valuation of a firm, then firms would have an incentive to enhance their governance.

The remainder of this paper is organized as follows. Section 2 describes the institutional background of D&O insurance and develops our hypothesis. In Section 3, we discuss the research design. Section 4 presents empirical findings, including the sample selection and data description. Section 5 contains robustness checks, and Section 6 concludes our research.

2. Institutional background and hypothesis development

2.1 D&O liability insurance

Since D&O insurance first became available in the 1930s, it has become an important protection for D&O against personal legal liabilities resulting from their business decisions. Providing such protection enables firms to attract and retain talented managers. In general, D&O insurance policies provide coverage for both corporate and personal liability that includes:

- reimbursement for a corporation's indemnification payments;
- coverage for individual D&O for their wrongful acts to the extent that indemnification does not apply; and
- optional coverage for a corporation's own liability[2].

D&O insurance policies typically cover damages, settlements, judgments, and litigation expenses, excluding civil or criminal fines or penalties, punitive damages, and multiple damages. According to the 2002, 2003, and 2004 surveys by Towers Perrin, the percentage of US and Canadian participants that reported purchasing D&O liability insurance remained high, increasing from 92 (84) percent in 1998 to 99 (89) percent in 2004 for US (Canadian) participants. For both US and Canadian participants that did not have D&O insurance, high cost was the main reason for not purchasing the coverage (Towers Perrin, 2002, 2003, 2004).

Redington (2005) indicates that risk selection is of utmost importance in underwriting D&O insurance. To the extent that a firm's litigation risk is above or below that of its peers within an industry group, it affects the price as well as terms and conditions of D&O policies. D&O underwriters obtain comprehensive information on an applicant's risk factors from an extensive written application. The application details the firm's past lawsuits, business activities including plans for acquisitions or securities issuances, biographical information on its D&O, ownership structure and prior knowledge of acts or omissions likely to give rise to a claim (Holderness, 1990; Knepper and Bailey, 1993; Baker and Griffith, 2007). D&O insurers also conduct

background checks of the firm's management as part of the litigation risk assessment. Baker and Griffith (2007) report that D&O underwriters' assessment emphasizes the firm's underlying structure of incentives and constraints rather than the presence or absence of formal governance mechanisms. Their efforts are focused on understanding the nonstructural governance features. D&O underwriters surveyed in their study report that the corporate culture and management character can be best understood from examining the firm's internal incentive structures and constraints, such as corporate compensation practices, internal controls, and management's attitude toward risk[3].

Although D&O insurance premium can be used as a proxy for overall governance quality, its use has been limited in prior research. Core (2000) finds that a firm's D&O insurance premium is significantly associated with proxies for the quality of governance structure. Griffith (2006) and Baker and Griffith (2007) maintain that D&O premium is a superior proxy for governance quality. In addition to the risk information obtained through extensive assessments for pricing decisions (as discussed above), D&O underwriters have access to confidential information through non-disclosure agreements (NDAs) that equity analysts do not. Furthermore, D&O insurers put their own capital at risk from misevaluation of insured's governance risk, whereas third-party evaluators such as Moody's that operates on a fee-for-service model do not risk their own capital to evaluation errors (Griffith, 2006).

Using D&O insurance premium as a measure of corporate governance quality has an advantage over the structural governance measures commonly used in the literature. It is an external assessment of overall governance quality that has been determined after thorough analyses of governance risk by underwriters. To examine the relation between corporate governance and audit fees, Griffin *et al.* (2008) employ the G-index developed by Gompers *et al.* (2003) as their primary measure for governance quality. We believe that D&O insurance premium captures a broader aspect of corporate governance than G-index. The G-index is calculated based only on structural governance provisions such as compensation plans and cumulative voting, whereas D&O premium captures the structural as well as the non-structural features of governance.

2.2 Hypothesis development

Two competing perspectives on audit pricing have been documented in the literature. A risk-based perspective argues that effective internal monitoring through strong corporate governance is likely to reduce the inherent and/or control risk of misstatements and provide greater reliability to financial reports. Enhanced governance ensures higher quality financial reporting, reducing audit risk and litigation risk, and thus audit fees. In other words, when governance risk is high, auditors charge premium to provide additional audit efforts and to compensate for future litigation costs. Bedard and Johnstone (2004) find a positive relation between governance risk and auditors' billing rates when the risk of earnings manipulation is high. Tsui *et al.* (2001) show that firms with non-CEO-dominated independent boards are associated with low audit fees. They argue that because CEO-dominated boards provide less effective internal monitoring, such boards are associated with an increased risk of control and therefore an increased audit effort and fees. Mitra *et al.* (2007) report that concentrated block-holders (who can provide better monitoring) reduce audit risk and fees[4]. Finally, Boo and Sharma (2008) find lower

audit fees in regulated companies. They attribute their finding partly to external auditors' perception of lower risks due to stronger internal controls in regulated companies that reduce the extent of costly audit testing.

On the other hand, a demand-based perspective argues that strong corporate governance demands high quality audit, which may increase audit efforts and fees. In other words, the demand for stronger corporate governance induces firms to purchase high-quality audit service in order to reduce the likelihood of fraudulent financial reporting. Collier and Gregory (1996) show that the presence of an audit committee is associated with an increase in audit fees. Similarly, Abbott *et al.* (2003) and Goodwin-Stewart and Kent (2006) find that independent and active audit committees tend to result in high audit fees[5]. Using board characteristics, Carcello *et al.* (2002) document positive relations between audit fees and board independence, diligence, and expertise. Mitra *et al.* (2007) report a significantly positive relation between diffused institutional stock ownership and audit fees, consistent with a demand-based argument that institutional investors induce firms to obtain high-quality audit services. Griffin *et al.* (2008) provide evidence on countervailing relations between corporate governance and audit fees. They report a positive relation between governance quality and audit fees, but a negative relation between audit fees and the interaction of governance quality and audit risk variables. In summary, there exists mixed empirical evidence.

Auditors identify managerial characteristics as the second-most important factor affecting their assessment of litigation risk (Pratt and Stice, 1994). According to the more recent survey by Cohen *et al.* (2002), all auditors in their survey overwhelmingly upheld management credibility as the most important factor in corporate governance risk assessment. These findings are not surprising, considering that senior management sets the governance tone within a company, which promotes and facilitates effective governance practices (Cohen *et al.*, 2002). The importance of management in audit pricing suggests that an emphasis only on structural features of governance may be insufficient to fully understand the role and impact of corporate governance in audit risk. Mixed empirical evidence on the association between governance quality and audit fees may result from non-structural features of governance overlooked in the research.

Using D&O insurance premium as a measure of overall governance quality that captures non-structural features of governance, we posit that the higher the D&O premium, the lower the overall governance quality. A risk-based perspective predicts a positive association between D&O premiums and audit fees, since auditors would charge additional fees to compensate for audit risk and litigation risk due to increased governance risk. On the other hand, a demand-based perspective predicts a negative association, since firms with high governance quality (low D&O premium) would choose high quality audit services (high audit fees). Our hypothesis is stated in an alternative form as follows:

H_A . D&O premiums are associated with audit fees.

3. Research design

To test our hypothesis, we estimate the audit fee model (1) including industry-fixed effects. The model includes governance variables to control for structural features of governance, in addition to common control variables identified in the audit fee literature:

$$\begin{aligned}\ln AF = & \beta_0 + \beta_1 DOPREM + \beta_2 SIZE + \beta_3 CROSS + \beta_4 NUMSEG + \beta_5 INHRISK \\ & + \beta_6 ROA + \beta_7 LEVERAGE + \beta_8 APROBLEM + \beta_9 ALAG \\ & + \beta_{10} BIG4 + \beta_{11} ACQ + \beta_{12} DIVESTOR + \beta_{13} SPECIAL \\ & + \beta_{14} CEOCHAIR + \beta_{15} OUTSIDE + \beta_{16} BODMTG \\ & + \beta_{17} INSIDEOWN + \beta_{18} OUTBLOCK + \varepsilon\end{aligned}$$

(1)

$\ln AF$ is the natural log of audit fees. $DOPREM$ is the natural log of D&O insurance premium. Because mixed evidence on the association between governance and audit fees exist in the literature, we do not predict the sign of the coefficient on $DOPREM$. $SIZE$ is the natural log of lagged total assets. Audit fees are expected to increase with client size, since large firms tend to be sued more often and have complex internal control systems that increase audit difficulty (St Pierre and Anderson, 1984). $CROSS$ is equal to 1 if a firm is cross-listed in the USA, and 0 otherwise. The variable is expected to have a positive coefficient, since auditors tend to charge higher fees for firms listed on the US markets than in other countries because of strict legal environment in the USA with higher potential future litigation costs (Seetharaman *et al.*, 2002). $NUMSEG$ is the number of business segments. Simunic (1980) argues that the client's operational complexity makes an audit more difficult, and that the more difficult the audit, the more time-consuming it is. We expect a positive sign for the variable. $INHRISK$ is the sum of inventory and receivables, divided by total assets. Simunic (1980) and Stice (1991), among others, indicate that a positive relation exists between inherent risk and audit fees, since some parts of an audit require careful and specialized audit procedures due to high risk of error.

ROA is the net income over total assets with a negative expected coefficient. Because the poor performance of an audit client heightens the litigation risk of auditors, auditors charge higher fees to firms that experience a loss (Simunic, 1980; Choi *et al.*, 2009). $LEVERAGE$ is the ratio of equity to liability. We expect a positive sign on its coefficient, since financial distress of client firms can expose the auditor to loss and/or potential litigation and is likely to increase audit fees (Simunic, 1980). $APROBLEM$ is equal to 1 if an audit opinion other than unqualified is issued, and 0 otherwise. A positive coefficient is expected, since audit opinions other than unqualified may indicate audit problems that require auditors to exert greater effort and charge higher fees (Hay *et al.*, 2006). $ALAG$ is the number of calendar days between the fiscal year-end date to the filing date of the audit report. Because the likelihood of problems and/or difficulties with audit procedures or more complex financial reports increases with the length of the lag, we expect a positive sign on the coefficient of the variable (Knechel and Payne, 2001). $BIG4$ is equal to 1 if an auditor is one of the Big 4 audit firms, and 0 otherwise. The coefficient of this variable is expected to be positive, since higher audit quality should be more expensive (Hay *et al.*, 2006). ACQ is equal to 1 if the book value of total assets at the end of the fiscal year increases by more than 25 percent from the beginning of the fiscal year, and 0 otherwise. $DIVESTOR$ is equal to 1 if the book value of total assets at the end of the fiscal year decreases by more than 25 percent from the beginning of the fiscal year, and 0 otherwise. We expect that acquisitions and divestures would be positively associated with audit fees, since they may increase audit efforts and work. $SPECIAL$ is equal to 1 if a firm reports a special item in its

annual report, and 0 otherwise. We expect a positive association between the occurrence of special items and audit fees, since firms reporting special items increase the audit risk (DeFond *et al.*, 2002; Ashbaugh *et al.*, 2003).

CEOCHAIR is equal to 1 if the CEO is also the chairman of the board of directors, and 0 otherwise. The coefficient of CEOCHAIR is expected to have a positive sign, because Tsui *et al.* (2001) find that firms with boards whose chairman is also the CEO pay higher audit fees. OUTSIDE is the percentage of outside directors on the board and is expected to have a positive coefficient. Carcello *et al.* (2002) report a positive association between the percentage of outside directors and audit fees, indicating that independent boards demand high-quality audit services. BODMTG is the number of meetings held by the board of directors during a year. The board diligence (as measured by the number of board meetings) is expected to be positively associated with audit fees, since diligent boards demand high-quality audit services (Carcello *et al.*, 2002). INSIDEOWN is the percentage of shares held by inside directors. Its coefficient is expected to be negative, because the higher the percentage of shares held by inside directors, the lower the control risk and thus audit fees. OUTBLOCK is the percentage of shares held by outside shareholders who individually own over 10 percent of the firm's stock[6]. Since Mitra *et al.* (2007) report a negative relation between concentrated institutional ownership and audit fees, we expect a negative coefficient.

4. Empirical findings

4.1 Sample selection

The sample consists of Canadian firms listed on the Toronto Stock Exchange (TSX) from 2002 to 2004[7]. Their D&O insurance data are publicly available in proxy circulars because the Exchange has required firms to disclose firms' risk and their risk-management tools to strengthen corporate governance since 1993 (Core, 1997). The sample includes:

- Canadian firms that were cross-listed on the TSE 300 index (currently the S&P TSX index) and US markets; and
- local firms that were at least part of the TSE 300 index, which are identified through the monthly publication TSE Review (currently TSX eReview).

Table I presents the sample selection process. The initial sample includes 1,262 firm-years of 432 TSE 300 firms identified from the Compustat Canadian industrial quarterly research file. Based on the monthly TSE Review, we delete

Sample period from 2002 to 2004	No. of firm-years	No. of firms
TSE 300 in Compustat Canadian industrial quarterly file	1,262	432
Changed a cross-listing status during a year	(234)	(69)
Merged, acquired, or went bankrupt	(38)	(20)
D&O insurance premiums unavailable	(91)	(19)
Governance data unavailable	(436)	(139)
Financials unavailable in Compustat	(220)	(68)
Financial or utility industries	(25)	(9)
Final sample	218	108

Table I.
Sample selection

234 firm-years of 69 firms that were not cross-listed in US markets for the entire year for the cross-listed sample, or were cross-listed for at least one month during a year for the local sample. This check enables us to exclude the firms that changed their cross-listing status during a year, introducing noise into our data. We exclude 38 firm-years of 20 firms that were merged, acquired, or went bankrupt, and 527 firm-years of 158 firms with D&O insurance premium and governance data that were unavailable at www.sedar.com[8]. Further, we remove 220 firm-years of 68 firms with financials unavailable in the Compustat Canadian industrial annual research file. After excluding 25 firm-years of nine firms with membership in the financial (SIC codes 6000-6099, 6200-6299) or utility (4900-4999) industries, the final sample includes 218 firm-years of 108 firms.

4.2 Descriptive statistic

Panel A of Table II presents descriptive statistics. The average audit fees paid by the sample firms are \$1.96 million[9]. The sample firms, on average, pay D&O insurance premiums of about \$0.81 million. The sample carries D&O insurance with coverage limits of about \$69 million, on average. The expensiveness of D&O liability insurance (as measured by premiums/coverage limits) indicates that the sample firms pay about 1 cent per dollar of coverage limit. Inventory and receivables that represent the inherent risk are about 22 percent of total assets. The average ROA is 1 percent and the average reporting lag of sample firm-years is about 49 days. The outside directors represent 82 percent of the board of directors, while the board meets nine times during the year, on average. Inside directors' ownership averages 5 percent, while outside blockholders' ownership is about 6 percent. Our sample includes only one firm-year with audit problems, 212 firm-years with Big 4 auditors, 40 firm-years involved in acquisitions, 13 firm-years involved in divestitures, and 46 firm-years in which the CEO serves as the chairman of the board of directors.

Panel B of Table II reports descriptive statistics of the cross-listed and local firms. We partition the sample into cross-listed and local samples to explore differences in firm characteristics in different reporting environment. The final sample includes 118 cross-listed firm-years and 100 local firm-years. Mean audit fees of the cross-listed sample are greater than those of the local sample (\$2.96 million vs \$0.78 million). The average D&O insurance premium of the cross-listed sample is \$1.25 million, whereas that of the local sample is \$0.29 million. The cross-listed sample carries D&O coverage limits of \$92.35 million, while the local sample carries about \$41.74 million coverage limits, on average. The average premium per coverage limit dollar is \$0.02 for the cross-listed and \$0.01 for the local sample, indicating that D&O insurance is more expensive for cross-listed firms than for local firms. The cross-listed sample firms tend to be larger than the local sample firms and have more business segments (3.51 vs 1.54). The local sample has a higher ratio of receivables and inventory to total assets (0.16 vs 0.29). The cross-listed sample has a lower percentage of outside block-holders than the local sample (0.05 vs 0.08). The boards of directors of cross-listed sample firms meet about 9.79 times a year, while those of the local sample firms meet 8.80 times. These differences are statistically significant at the 1, 5, or 10 percent levels (Panel D). Additionally, 26 percent of the cross-listed sample and 15 percent of the local sample have a CEO as chairman of the board. Data are winsorized at the top and bottom 5 percent to mitigate the influence of extreme outliers.

Panel A: descriptive statistics of full sample (n = 218)				
	Mean	Min.	Median	Max.
Audit fees (m\$)	1.96	0.08	0.78	59.88
D&O premiums (m\$)	0.81	0.00	0.30	18.01
D&O coverage limits (m\$)	69.14	0.00	40.00	446.00
Premiums/coverage limits	0.01	0.00	0.01	0.11
SIZE	7.23	3.25	7.02	10.90
NUMSEG	2.61	1.00	2.00	12.00
INHRISK	0.22	0.00	0.20	0.80
ROA	0.01	-0.92	0.05	0.30
LEVERAGE	1.56	0.02	0.97	11.86
Reporting lags (ALAG*100)	49.09	17.00	48.00	132.00
OUTSIDE	0.82	0.43	0.86	0.94
BODMTG	9.34	3.00	9.00	30.00
INSIDEOWN	0.05	0.00	0.004	1.00
OUTBLOCK	0.06	0.00	0.00	0.55
APROBLEM	217 (99 percent) unqualified vs 1 (0.5 percent) other than unqualified opinion ($\chi^2 = 214$)			
BIG4	212 (97 percent) Big 4 auditors vs 6 (3 percent) non-Big 4 auditors ($\chi^2 = 195$)			
ACQ	40 (18 percent) involved in acquisition vs 178 (82 percent) not involved ($\chi^2 = 87$)			
DIVESTOR	13 (6 percent) involved in divestiture vs 205 (94 percent) not involved ($\chi^2 = 169$)			
SPECIAL	136 (62 percent) with a special item(s) vs 82 (38 percent) without a special item(s) ($\chi^2 = 13$)			
GEOCHAIR	46 (21 percent) with CEO = chairman vs 79 (79 percent) CEO \neq chairman ($\chi^2 = 73$)			
Panel B: descriptive statistics of cross-listed sample (n = 118)				
	Mean	Min.	Median	Max.
Audit fees (m\$)	2.96	0.10	1.09	59.88
D&O premiums (m\$)	1.25	0.00	0.64	18.01
D&O coverage limits (m\$)	92.35	0.00	54.96	442.00
Premiums/coverage limits	0.02	0.001	0.01	0.11
SIZE	7.68	3.69	7.62	10.90
SD				
				6.97
				2.14
				93.26
				0.02
				1.72
(continued)				

Table II.
Descriptive statistics

Table II.

NUMSEG	3.51	1.00	2.00	12.00	2.36
INHRISK	0.16	0.00	0.14	0.41	0.11
ROA	0.02	-0.79	0.05	0.19	0.15
LEVERAGE	1.69	0.23	0.96	11.86	1.87
Reporting lags (ALAG*100)	47.68	21.00	44.00	122.00	17.48
OUTSIDE	0.83	0.43	0.87	0.94	0.11
BODMTG	9.79	3.00	9.00	30.00	4.59
INSIDEOWN	0.06	0.00	0.00	1.00	0.16
OUTBLOCK	0.05	0.00	0.00	0.32	0.09
APROBLEM	118 (100 percent) unqualified vs 0 (0 percent) other than unqualified opinion ($\chi^2 = 21$)				
BIG4	112 (95 percent) Big 4 auditors vs 6 (5 percent) non-Big 4 auditors ($\chi^2 = 95$)				
ACQ	22 (19 percent) involved in acquisition vs 96 (81 percent) not involved ($\chi^2 = 46$)				
DIVESTOR	8 (7 percent) involved in divestiture vs 110 (93 percent) not involved ($\chi^2 = 88$)				
SPECIAL	78 (66 percent) with a special item(s) vs 40 (34 percent) without a special item(s) ($\chi^2 = 12$)				
CEOCHAIR	31 (26 percent) with CEO = chairman vs 87 (74 percent) CEO \neq chairman ($\chi^2 = 27$)				
<i>Panel C: descriptive statistics of local sample (n = 100)</i>					
	<i>Mean</i>	<i>Min.</i>	<i>Median</i>	<i>Max.</i>	<i>SD</i>
Audit fees (m\$)	0.78	0.08	0.52	7.81	1.02
D&O premiums (m\$)	0.29	0.00	0.12	6.21	0.82
D&O coverage limits (m\$)	41.74	0.00	25.00	446.00	60.04
Premiums/coverage limits	0.01	0.00	0.01	0.06	0.01
SIZE	6.69	3.25	6.62	9.90	1.36
NUMSEG	1.54	1.00	1.00	11.00	1.76
INHRISK	0.29	0.02	0.27	0.80	0.17
ROA	0.01	-0.92	0.05	0.30	0.19
LEVERAGE	1.42	0.02	0.98	9.47	1.63
Reporting lags (ALAG*100)	50.75	17.00	50.00	132.00	18.20
OUTSIDE	0.81	0.50	0.84	0.93	0.11
BODMTG	8.80	4.00	8.00	23.00	3.90
INSIDEOWN	0.04	0.00	0.00	0.62	0.12
OUTBLOCK	0.08	0.00	0.00	0.55	0.11
APROBLEM	99 (97 percent) unqualified vs 1 (1 percent) other than unqualified opinion ($\chi^2 = 96$)				
BIG4	100 (100 percent) Big 4 auditors vs 0 (0 percent) non-Big 4 auditors ($\chi^2 = 0$)				
ACQ	18 (18 percent) involved in acquisition vs 82 (82 percent) not involved ($\chi^2 = 41$)				

(continued)

DIVESTOR 5 (5 percent) involved in divestiture vs 95 (95 percent) not involved ($\chi^2 = 81$)
 SPECIAL 58 (58 percent) with a special item(s) vs 42 (42 percent) without a special item(s) ($\chi^2 = 3$)
 CEOCHAIR 15 (15 percent) with CEO = chairman vs 85 (85 percent) CEO \neq chairman ($\chi^2 = 49$)
Panel D: t-tests and Wilcoxon tests (cross-listed vs local sample)

	t-value	p-value	z-value	p-value
Audit fees	3.11	<0.01 ***	5.10	<0.01 ***
D&O premiums	4.22	<0.01 ***	8.31	<0.01 ***
D&O coverage limits	4.67	<0.01 ***	5.14	<0.01 ***
Premiums/coverage limits	4.68	<0.01 ***	6.31	<0.01 ***
SIZE	4.66	<0.01 ***	3.86	<0.01 ***
NUMSEG	6.88	<0.01 ***	9.38	<0.01 ***
INHRISK	-7.15	<0.01 ***	-6.17	<0.01 ***
ROA	0.28	0.78	0.07	0.95
LEVERAGE	1.12	0.26	0.86	0.39
Reporting lags (ALAG*100)	-1.27	0.21	-1.33	0.19
OUTSIDE	1.39	0.17	2.01	0.05 **
BODMTG	1.70	0.09 *	1.86	0.06 *
INSIDEOWN	0.85	0.39	-0.42	0.68
OUTBLOCK	-2.66	<0.01 ***	-2.72	<0.01 ***

Notes: Significant at: *10, **5, and ***1 percent levels, respectively, based on two-tailed tests; dollar amounts are stated in million Canadian dollars; the full, the cross-listed, and the local sample include 185, 108, and 77 observations that carry D&O insurance, respectively; variable definitions are as follows: SIZE – the natural log of lagged total assets; NUMSEG – the number of business segments; INHRISK – the sum of inventory and receivables, divided by total assets; ROA – the net income over total assets; LEVERAGE – the ratio of equity to liabilities; ALAG – the number of calendar days between the fiscal year-end date to the filing date of the audit report, divided by 100; OUTSIDE – the percentage of outside directors on the board; BODMTG – the number of meetings held by board of directors; INSIDEOWN – the percentage of shares held by inside directors; OUTBLOCK – the percentage of ownership held by outside shareholders who individually own over 10 percent of the firm's stock; APRBLEM – 1 if an audit opinion other than unqualified is issued and 0 otherwise; BIG4 – 1 if an auditor is one of the Big 4 audit firms and 0 otherwise; ACQ – 1 if the book value of total assets at the end of the fiscal year increases by more than 25 percent from the beginning of the fiscal year and 0 otherwise; DIVESTOR – 1 if the book value of total assets at the end of the fiscal year decreases by more than 25 percent from the beginning of the fiscal year and 0 otherwise; SPECIAL – 1 if a firm reports a special item in its annual reports and 0 otherwise; and CEOCHAIR – 1 if the CEO is also the chair of the board of directors and 0 otherwise

Table II.

Table III reports correlations among the variables. Both Pearson and Spearman correlations show that D&O premium is significantly correlated with audit fees. Consistent with extant evidence, client size, a cross-listed status, the number of business segments, audit problems, and the existence of special items are significantly correlated with audit fees. The analysis also shows that D&O premium is significantly correlated with the number of outside directors and the number of board meetings.

4.3 Estimation results

Panel A of Table IV presents regression results of audit fees on determinants using the full sample. Based on Petersen (2009) and Gow *et al.* (2010), we report standard errors clustered by two dimensions of firm and time. In Column (1), we estimate regression of audit fees on determinants other than the D&O insurance premium. The number of board meetings (BODMTG) and the ownership of inside directors (INSIDEOWN) are positively significant at the 1 percent level, supporting the demand-based audit pricing. Column (2) shows that the D&O insurance premium is positively significant at the 1 percent level, and adjusted R^2 increases by 0.02, suggesting that non-structural features of governance are incrementally associated with auditors' private information about audit risk and litigation risk. In Column (3), the inclusion of D&O insurance premiums in addition to other governance variables increases adjusted R^2 by 0.03. The coefficient of DOPREM is still significantly positive at the 1 percent level, even after controlling for the quality of structural governance. This result indicates that auditors charge higher fees to firms with a heightened audit risk from a non-structural governance risk, thus supporting the risk-based audit pricing. High audit fees due to the demand for a high-quality audit service by strong governance may be dominated by high fees due to a heightened audit risk from a non-structural governance risk. This result suggests that the quality of non-structural governance features such as internal culture and management character play an important role in auditors' assessment and pricing decisions.

To ensure that our main results are not driven by firms cross-listed in the USA facing higher litigation risk than in Canada, we separately run our audit fee model for cross-listed and local subsamples. Panel B of Table IV presents regression results similar to those using the full sample.

5. Robustness checks

5.1 Selection bias and endogeneity

Differences between non-purchasers and purchasers of D&O insurance could drive variations in audit fees. For instance, if firms decide to purchase D&O insurance to the extent that it would impact auditors' pricing decisions, a firm's choice of D&O insurance purchase would be endogenous. On the other hand, because auditing is one of governance mechanisms, governance quality enhanced by high-quality audit services could affect the choice of whether to purchase D&O insurance or coverage limits. To control for the potential selection bias and endogeneity, we estimate the Heckman (1979) model.

We run the logistic regression model (2) to obtain the inverse Mills ratio in the first stage, and then include the ratio in the second-stage estimation of the model (1). Equation (3) is estimated to obtain the predicted amount of premium as shown below:

Table III.
Correlations among
variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
(1) lnAF																			
(2) DOPREM	0.52																		
(3) SIZE	0.79	0.41																	
(4) CROSS	0.35	0.56	0.26																
(5) NUMSEG	0.33	0.42	0.21	0.64															
(6) INHRISK	-0.04	-0.18	-0.09	-0.42	-0.21														
(7) ROA	-0.03	0.06	0.11	0.00	-0.05	0.12													
(8) LEVERAGE	-0.46	-0.17	-0.52	0.06	0.02	-0.24	0.09												
(9) APROBLEM	0.28	0.33	0.17	0.38	0.21	-0.01	-0.01	-0.01											
(10) ALAG	-0.23	-0.06	-0.35	-0.09	-0.02	0.21	-0.15	0.11	0.10										
(11) BIG4	0.04	-0.01	0.08	-0.15	-0.09	-0.06	-0.09	-0.08	0.07	-0.06									
(12) ACQ	-0.14	-0.11	-0.24	0.01	-0.03	-0.03	0.05	-0.06	-0.01	0.06	-0.28								
(13) DIVESTOR	0.10	0.11	-0.01	0.04	0.09	-0.10	-0.24	-0.03	0.10	-0.07	0.04	-0.12							
(14) SPECIAL	0.24	0.24	0.19	0.08	0.18	-0.06	-0.27	-0.13	0.13	0.01	0.16	-0.29	0.20						
(15) CEOCHAIR	-0.05	-0.03	-0.11	0.14	0.03	0.02	-0.02	-0.07	0.02	0.14	0.02	0.07	0.01	-0.06					
(16) OUTSIDE	0.25	0.21	0.38	0.14	-0.02	-0.15	-0.07	-0.19	0.06	-0.21	0.21	-0.14	0.03	0.07	-0.22				
(17) BODMTG	0.10	0.15	0.01	0.13	0.15	-0.20	-0.17	0.15	0.12	-0.03	0.07	-0.05	0.16	0.25	-0.02	0.05			
(18) INSIDEOWN	-0.17	-0.10	-0.35	-0.03	0.02	0.21	-0.12	0.02	-0.10	0.31	-0.16	0.19	-0.02	-0.14	0.37	-0.25	-0.14		
(19) OUTBLOCK	0.01	-0.03	0.03	-0.18	-0.21	0.17	0.05	-0.18	0.02	-0.14	0.12	0.05	-0.08	-0.06	0.03	0.15	-0.09	0.09	

Notes: Pearson correlations are shown above the diagonal and Spearman correlations below the diagonal; italic figures indicate significant at the 5 percent level; variable definitions are as follows: lnAF – the natural log of audit fees; DOPREM – the natural log of the D&O insurance premium; SIZE – the natural log of lagged total assets; CROSS – 1 if a firm is cross-listed in the USA and 0 otherwise; NUMSEG – the number of business segments; INHRISK – the sum of inventory and receivables, divided by total assets; ROA – the net income over total assets; LEVERAGE – the ratio of equity to liabilities; APROBLEM – 1 if an audit opinion other than unqualified is issued and 0 otherwise; ALAG – the number of calendar days between the fiscal year-end date to the filing date of the audit report, divided by 100; BIG4 – 1 if an auditor is one of the Big 4 audit firms and 0 otherwise; ACQ – 1 if the book value of total assets at the end of the fiscal year increases by more than 25 percent from the beginning of the fiscal year and 0 otherwise; DIVESTOR – 1 if the book value of total assets at the end of the fiscal year decreases by more than 25 percent from the beginning of the fiscal year and 0 otherwise; SPECIAL – 1 if a firm reports a special item in its annual reports and 0 otherwise; CEOCHAIR – 1 if the CEO is also the chair of the board of directors and 0 otherwise; OUTSIDE – the percentage of outside directors on the board; BODMTG – the number of meetings held by board of directors; INSIDEOWN – the percentage of shares held by inside directors; and OUTBLOCK – the percentage of shares held by outside shareholders who individually own over 10 percent of a firm's stock

Table IV.
OLS regression
of audit fees

Panel A: OLS regression using the full sample									
Variable	Predicted sign	(1)			(2)			(3)	
		Coef.	t-value		Coef.	t-value		Coef.	t-value
DOPREM	?	—			0.61	5.85***		0.62	5.92***
SIZE	+	0.58	21.18***		0.52	20.41***		0.53	20.46***
CROSS	+	0.27	2.65**		0.08	0.84		0.11	1.21
NUMSEG	+	0.21	2.79***		0.21	3.25***		0.17	2.98**
INHRISK	+	0.23	0.36		0.52	0.80		0.39	0.69
ROA	—	−0.46	−1.15		−0.91	−2.92***		−0.83	−2.68***
LEVERAGE	+	−0.02	−0.38		−0.02	−0.41		−0.01	−0.27
APROBLEM	+	0.18	8.11***		0.88	5.33***		1.00	6.13**
ALAG	+	0.46	1.36*		0.32	1.35*		0.20	0.89
BIG4	+	0.51	2.46***		0.16	0.45		0.47	2.07**
ACQ	+	0.22	6.85***		0.22	5.13***		0.26	7.81***
DIVESTOR	+	0.29	1.41*		0.23	6.87***		0.20	5.74***
SPECIAL	+	1.02	0.83		1.74	2.78**		1.97	3.08***
CEOCHAIR	+	−0.14	−1.31*			—		−0.17	−1.70**
OUTSIDE	+	−0.35	−0.68			—		−0.46	−1.33*
BODMTG	+	0.03	4.21***			—		0.02	3.10***
INSIDEOWN	?	1.11	2.71***			—		1.28	3.50***
OUTBLOCK	—	0.18	0.46			—		−0.06	−0.15
<i>n</i>		218			218			218	
Adjusted <i>R</i> ²		0.79			0.81			0.82	
Panel B: OLS regression using the cross-listed and the local sample									
Variable	Predicted sign	Cross-listed sample		Local sample					
		Coef.	t-value	Coef.	t-value				
DOPREM	?	0.67	5.74***	0.49	8.10***				
SIZE	+	0.65	12.86***	0.58	18.54***				

(continued)

NUMSEG	+	0.17	2.52***	0.26	3.95***
INHRISK	+	1.87	2.24**	-0.44	-1.32*
ROA	-	-0.84	-1.32*	-1.17	-1.81**
LEVERAGE	+	1.45	4.54***	-0.03	-0.67
APROBLEM	+		-	1.48	25.67***
ALAG	+	0.54	1.48*	0.33	1.35*
BIG4	+	0.53	4.96***		-
ACQ	+	0.34	2.85***	0.26	2.07**
DIVESTOR	+	0.69	3.45***		-
SPECIAL	+	2.25	3.16***	0.70	0.30
CEOCHAIR	+	-0.05	-0.45	-0.37	-1.60*
OUTSIDE	+	-0.23	-0.42	-0.40	-1.25
BODMTG	+	-0.00	-0.15	0.02	7.63***
INSIDEOWN	?	1.44	2.28**	1.06	2.95***
OUTBLOCK	-	-0.80	-1.39*	0.44	0.86
<i>n</i>		118		100	
Adjusted R^2 =		0.84		0.84	

Notes: Significant at: *10, **, and ***1 percent levels, respectively, based on one-tailed tests; the *t*-statistics are based on standard errors clustered by both firm and time; variable definitions are as follows: lnAF – the natural log of audit fees; DOPREM – the natural log of the D&O insurance premium; SIZE – the natural log of lagged total assets; CROSS – 1 if a firm is cross-listed in the USA and 0 otherwise; NUMSEG – the number of business segments; INHRISK – the sum of inventory and receivables, divided by total assets; ROA – the net income over total assets; LEVERAGE – the ratio of equity to liabilities; APROBLEM – 1 if an audit opinion other than unqualified is issued and 0 otherwise; ALAG – the number of calendar days between the fiscal year-end date to the filing date of the audit report, divided by 100; BIG4 – 1 if an auditor is one of the Big 4 audit firms and 0 otherwise; ACQ – 1 if the book value of total assets at the end of the fiscal year increases by more than 25 percent from the beginning of the fiscal year and 0 otherwise; DIVESTOR – 1 if the book value of total assets at the end of the fiscal year decreases by more than 25 percent from the beginning of the fiscal year and 0 otherwise; SPECIAL – 1 if a firm reports a special item in its annual reports and 0 otherwise; CEOCHAIR – 1 if the CEO is also the chair of the board of directors and 0 otherwise; OUTSIDE – the percentage of outside directors on the board; BODMTG – the number of meetings held by board of directors; INSIDEOWN – the percentage of shares held by inside directors; and OUTBLOCK – the percentage of shares held by outside shareholders who individually own over 10 percent of a firm's stock

Table IV.

$$\begin{aligned}
P(\text{PURCHASE} = 1) = & \alpha_0 + \alpha_1 \text{SIZE} + \alpha_2 \text{CROSS} + \alpha_3 \text{MBRATIO} \\
& + \alpha_4 \text{HIGHTECH} + \alpha_5 \text{ROE} + \alpha_6 \text{RETURN} + \alpha_7 \text{STOCKVOL} \\
& + \alpha_8 \text{LEVERAGE} + \alpha_9 \text{ACQ} + \alpha_{10} \text{DIVESTOR} \\
& + \alpha_{11} \text{LITIGATION} + \alpha_{12} \text{CEOEXP} \\
& + \alpha_{13} \text{CEOCHAIR} + \alpha_{14} \text{OUTSIDE} \\
& + \alpha_{15} \text{INSIDEOWN} + \alpha_{16} \text{OUTBLOCK} + \varepsilon
\end{aligned} \tag{2}$$

$$\begin{aligned}
\text{DOPREM} = & \gamma_0 + \gamma_1 \text{SIZE} + \gamma_2 \text{CROSS} + \gamma_3 \text{MBRATIO} + \gamma_4 \text{HIGHTECH} \\
& + \gamma_5 \text{ROE} + \gamma_6 \text{RETURN} + \gamma_7 \text{STOCKVOL} + \gamma_8 \text{LEVERAGE} \\
& + \gamma_9 \text{ACQ} + \gamma_{10} \text{DIVESTOR} + \gamma_{11} \text{LITIGATION} + \gamma_{12} \text{CEOEXP} \\
& + \gamma_{13} \text{CEOCHAIR} + \gamma_{14} \text{OUTSIDE} + \gamma_{15} \text{INSIDEOWN} \\
& + \gamma_{16} \text{EXCOV} + \varepsilon
\end{aligned} \tag{3}$$

Variables are defined as follows: PURCHASE – 1 if a firm carries D&O liability insurance, and 0 otherwise; DOPREM – the natural log of D&O insurance premium; SIZE – the natural log of lagged total assets; CROSS – 1 if a firm is cross-listed in the USA, and 0 otherwise; MBRATIO – the ratio of market value to book value; HIGHTECH – 1 if a firm is a member of pharmaceutical (SIC codes 2833-2836), R&D services (8731-8734), programming (7371-7379), computers (3570-3577), or electronics (3600-3674) industries, and 0 otherwise; ROE – the net income over stockholders' equity; RETURN – the lagged stock return; STOCKVOL – the stock return volatility over the previous five years; LEVERAGE – the ratio of equity to liability; ACQ – 1 if the book value of total assets at the end of the fiscal year increases by more than 25 percent from the beginning of the fiscal year, and 0 otherwise; DIVESTOR – 1 if the book value of total assets at the end of the fiscal year decreases by more than 25 percent from the beginning of the fiscal year, and 0 otherwise; LITIGATION – 1 if the firm is involved in a lawsuit(s), and 0 otherwise; CEOEXP – the natural log of the number of years the CEO has served on a firm's board of directors; CEOCHAIR – 1 if the CEO is also the chairman of the board of directors, and 0 otherwise; OUTSIDE – the percentage of outside directors on a board of directors; INSIDEOWN – the percentage of shares held by inside directors; OUTBLOCK – the percentage of shares held by outside shareholders who individually own over 10 percent of the firm's stock; and EXCOV – excess D&O insurance coverage limits, as measured by the residuals from the regression of D&O insurance coverage limits on determinants included in equation (3).

Table V presents the estimation results for D&O insurance purchase decisions and premiums. Column (1) of Panel A shows that firm size, a cross-listing status, a membership in high-tech industry, profitability, being involved in acquisitions and divestitures, CEO domination, and the ownership of inside directors are statistically significant for firms' purchase decisions. Column (2) shows that firm size, a cross-listing status, financial distress, the number of years that the CEO has served on the board, the percentage of shares held by inside directors, outside block-holders, and excess coverage are significantly associated with D&O insurance premium. Panel B of the second-stage estimation results shows the positive association between D&O insurance premiums

Panel A: estimations for D&O insurance purchase decisions and premiums

Variable	Predicted sign	(1) <i>Dependent variable – PURCHASE</i>		(2) <i>Dependent variable – DOPREM</i>	
		Coef.	p-value	Coef.	t-value
SIZE	+	-0.33	0.03**	0.11	6.02***
CROSS	+	1.75	<0.01***	0.27	3.35***
MBRATIO	+	-0.15	0.54	0.01	0.37
HIGHTECH	+	3.34	<0.01***	0.37	6.96***
ROE	-	4.05	<0.01***	-0.03	-0.37
RETURN	-	0.29	0.40	0.09	11.21***
STOCKVOL	+	-0.07	0.88	0.05	0.68
DEBTS	+	7.95	<0.01***	0.66	3.15***
ACQ	+	-0.95	0.02**	-0.09	-1.66*
DIVESTOR	+	2.27	0.04**	0.09	1.27
LITIGATION	+	-0.42	0.25	0.04	0.90
CEOEXP	-	0.18	0.36	0.05	2.83***
CEOCHAIR	+	-1.26	<0.01***	0.03	0.60
OUTSIDE	-	-1.01	0.54	-0.06	-0.53
INSIDEOWN	-	-2.58	0.09*	-0.45	-1.95**
OUTBLOCK	-	1.21	0.56	0.27	2.25***
EXCOV	+		-	0.11	6.26***
<i>n</i>		218		218	
Model fit		$\chi^2 = 83.97$		Adjusted $R^2 = 0.63$	
Panel B: second-stage estimations for audit fees					
Variable	Predicted sign	(1) <i>Heckman</i>		(2) <i>Predicted premium</i>	
		Coef.	p-value	Coef.	t-value
DOPREM	?	0.59	5.79***		-
PREDPREM	?			0.76	4.95***
SIZE	+	0.54	17.57***	0.51	18.53***
CROSS	+	0.06	0.68	0.04	0.43
NUMSEG	+	0.18	3.16***	0.21	3.24***
INHRISK	+	0.42	0.72	0.44	0.80
ROA	-	-1.07	-3.01***	-0.54	-1.48*
LEVERAGE	+	-0.00	-0.01	-0.01	-0.15

Table V.
Robustness checks:
two-stage estimations

(continued)

Table V.

APROBLEM	+	0.97	6.82***	1.20	7.11***
ALAG	+	0.16	0.70	0.35	1.35*
BIG4	+	0.48	2.12**	0.51	2.45***
ACQ	+	0.26	9.78***	0.24	5.54***
DIVESTOR	+	0.20	6.04***	0.22	2.39***
SPECIAL	+	1.95	2.95***	1.45	1.71**
CEOCHAIR	+	-0.11	-0.95	-0.18	-1.82***
OUTSIDE	+	-0.45	-1.30*	-0.41	-1.09
BODMTG	+	0.02	3.40***	0.02	4.12***
INSIDEOWN	?	1.36	3.47***	1.36	4.29***
OUTBLOCK	-	-0.10	-0.24	-0.07	-0.17
MILLS	?	-0.13	-2.46***	-	-
<i>n</i>		218		218	
Adjusted R^2		0.82		0.81	

Notes: Significant at: *, **, and ***1 percent levels, respectively, on one-tailed tests for OLS estimations; the *t*-statistics are based on standard errors clustered by both firm and time; PURCHASE – 1 if a firm carries D&O liability insurance and 0 otherwise; DOPREM – the natural log of the D&O insurance premium; PREDPREM – the natural log of a predicted D&O insurance premium; SIZE – the natural log of lagged total assets; CROSS – 1 if a firm is cross-listed in the USA and 0 otherwise; MBRATIO – the ratio of market value to book value; HIGHTECH – 1 if a firm is a member of pharmaceuticals (SIC codes 2833-2836), R&D services (8731-8734), programming (7371-7379), computers (3570-3577), or electronics (3600-3674) industries and 0 otherwise; NUMSEG – the number of business segments; INHRISK – the sum of inventory and receivables, divided by total assets; ROE – the net income over stockholders' equity; ROA – the net income over total assets; RETURN – the lagged stock return; STOCKVOL – the stock return volatility over the previous five years; DEBTS – the ratio of debts to total assets; LEVERAGE – the ratio of equity to liabilities; APROBLEM – 1 if an audit opinion other than unqualified is issued and 0 otherwise; ALAG – the number of calendar days between the fiscal year-end date to the filing date of the audit report, divided by 100; BIG4 – 1 if an auditor is one of the Big 4 audit firms and 0 otherwise; ACQ – 1 if the book value of total assets at the end of the fiscal year increases by more than 25 percent from the beginning of the fiscal year and 0 otherwise; DIVESTOR – 1 if the book value of total assets at the end of the fiscal year decreases by more than 25 percent from the beginning of the fiscal year and 0 otherwise; SPECIAL – 1 if a firm reports a special item in its annual reports and 0 otherwise; LITIGATION – 1 if the firm is involved in a lawsuit(s) and 0 otherwise; CEOEXP – the natural log of the number of years the CEO has served on a firm's board of directors; CEOCHAIR – 1 if the CEO is also the chairman of the board of directors and 0 otherwise; OUTSIDE – the percentage of outside directors on the board; BODMTG – the number of meetings held by board of directors; INSIDEOWN – the percentage of shares held by inside directors; OUTBLOCK – the percentage of shares held by outside shareholders who individually own over 10 percent of the firm's stock; EXCOV – excess D&O insurance coverage limits, as measured by the residuals from regression of D&O insurance coverage limits on determinants included in equation (3); and MILLS – the inverse Mill's ratio obtained from estimation of equation (2)

and audit fees in Column (1). The regression using the predicted amounts of premiums in Column (2) also provides consistent results. These results support that our main findings are robust to the selection bias and endogeneity.

5.2 Alternative measures of D&O insurance premiums

We conduct tests using either the excess premium beyond the expected amount given the firm size and other determinants or the expensiveness of D&O liability insurance. We measure the excess premium by the residuals from the estimation of equation (3). The expensiveness of D&O insurance is measured by the premium over D&O insurance coverage limits, which represents the dollar amount of premiums paid to purchase a dollar of coverage limits. The coefficients of the variables are positively significant at the 1 percent level (not tabulated). Test results are consistent with the main findings that firms with weak governance pay higher audit fees.

6. Conclusion

This paper examines the association between governance quality and audit fees using D&O premium as a proxy for overall governance quality that captures both structural and non-structural governance features. Prior studies using measures of structural governance document mixed evidence on the association, supporting risk-based or demand-based audit pricing. We argue that using D&O premium as a proxy for overall governance quality has advantages over the measures commonly used in the literature, because it is an external assessment of governance quality that considers both the structural and non-structural features of governance. Using D&O premiums of Canadian firms, we find a positive association between D&O premiums and audit fees, indicating that auditors charge higher fees to firms with low governance quality. Moreover, the positive association between D&O premiums and audit fees hold even after controlling for the quality of structural governance, suggesting that non-structural features of governance are incrementally associated with auditors' private information about audit risk and litigation risk. Our results are robust to the selection bias and endogeneity.

This study adds to our understanding of the role of governance quality in audit pricing. Our findings suggest that structural features of governance may be insufficient to fully explain the impact of corporate governance on audit fees. Thus, researchers should carefully consider both structural and non-structural features of governance in their assessment of governance quality. This study makes an attempt to understand the role of non-structural aspects of corporate governance that have been overlooked in the literature despite their importance.

Our findings also suggest that the policy-makers should consider mandating firms to disclose D&O insurance policies. D&O premium details can be used as a proxy for non-public information on non-structural features of governance, facilitating market participants' understanding of a firm's governance quality. In addition, as Griffith (2006) points out, a public disclosure of D&O insurance premium could have a signaling effect that motivates firms to improve their governance quality.

This study, however, has some caveats. The extent to which high D&O insurance premiums result from managers' risk management diminishes the strength of D&O premium as a proxy for governance quality. For example, it is plausible that risk-averse managers would protect themselves from personal legal liability by purchasing high D&O insurance coverage limits, thus paying high premiums. A significant positive

association between D&O premiums and audit fees can result if the amount of premium signals the expected litigation risk of the firm regardless of its governance quality. Although we include in our estimation model the control variables identified in the literature, we cannot completely rule out the possibility of omitted variables. This study uses a relatively small sample of Canadian firms with the sample period from 2002 to 2004. The limited sample period helps us to circumvent the potential confounding effects of new rules and standards regarding internal control over financial reporting that came into effect subsequent to our sample period[10]. Future research using an extended sample period can be beneficial for understanding the effects of strengthened internal control on the association between governance and audit fees.

Notes

1. The structural features are formal control mechanisms of the firm, such as board independence and committee composition, whereas the non-structural features include internal culture and management character that influence the effectiveness of the control mechanisms. Baker and Griffith (2007) define culture as a system of incentives and constraints operating within a firm, based upon formal rules, informal norms, or some combination of the two, that provides a sense of how strong the norm of either compliance or defection is within the organization. They also define management character as follow: [...] the management's "ability to rationalize its way around rules and whether it is likely to be made up of risk-takers above the norm" [...].
2. Although the definition of a wrongful act could include a number of activities by D&O, it usually refers to any error, misstatement, misleading statement, omission, or neglect.
3. For example, Griffith (2006) asks the following questions to understand the company practices and culture: [...] how does "bad news" flow upward within the organization? Does the corporate culture encourage such news to be brought to the attention of senior management? How does the company select a new member of the Board? How does the search process take place? [...].
4. They also report evidence consistent with a demand-based perspective.
5. The earlier study by Goddard and Masters (2000) find no evidence that audit committees have any effect on audit fees.
6. Canadian firms are required to disclose block shareholders who own over 10 percent of a firm's stock.
7. The Multilateral Instrument 52-110 that contains rules for disclosures of external auditor service fees became effective on March 31, 2004. The 2002 fees are available in proxy circulars that provide comparative information revealing a firm's fees billed during the last two fiscal years. We limit the sample period to have manageable hand-collection when this study was launched.
8. Some firms state in their proxy circulars that they carry D&O insurance but do not reveal the amount. When a proxy circular lacks information, we assume that the firm does not carry D&O insurance.
9. The currency in this paper is Canadian dollars, unless otherwise stated. For firms reporting D&O insurance coverage in US dollars, the average exchange rate over the fiscal year is used to convert US dollars into Canadian dollars. The average exchange rate during the sample period from 2002 to 2004 was 0.68 US cents for one Canadian dollar.
10. The Sarbanes-Oxley Act (SOX) Section 404, Management Assessment of Internal Controls, became effective for the US domestic accelerated filers beginning in fiscal years ending on or after November 15, 2004. The Auditing Standard No. 5 (PCAOB, 2007) superseded Auditing Standard No. 2 (PCAOB, 2004), providing guidance for auditors when they audit internal control over financial reporting.

References

- Abbott, L., Parker, S., Peters, G. and Raghunandan, K. (2003), "The association between audit committee characteristics and audit fees", *Auditing: A Journal of Practice & Theory*, Vol. 22 No. 2, pp. 17-32.
- Ashbaugh, H., LaFond, R. and Mayhew, B. (2003), "Do nonaudit services compromise auditor independence? Further evidence", *The Accounting Review*, Vol. 78 No. 3, pp. 611-639.
- Baker, T. and Griffith, S. (2007), "Predicting corporate governance risk: evidence from the directors' and officers' liability insurance market", *Chicago Law Review*, Vol. 74 No. 2, pp. 487-544.
- Bedard, J. and Johnstone, K. (2004), "Earnings manipulation risk, corporate governance risk, and auditors' planning and pricing decision", *The Accounting Review*, Vol. 79 No. 2, pp. 277-304.
- Boo, E. and Sharma, D. (2008), "Effect of regulatory oversight on the association between internal governance characteristics and audit fees", *Accounting and Finance*, Vol. 48 No. 1, pp. 51-71.
- Carcello, J., Hermanson, D., Neal, T. and Riley, R. (2002), "Board characteristics and audit fees", *Contemporary Accounting Research*, Vol. 19 No. 3, pp. 365-384.
- Choi, J., Kim, J., Liu, X. and Simunic, D. (2009), "Cross-listing audit fee premiums: theory and evidence", *The Accounting Review*, Vol. 84 No. 5, pp. 1429-1463.
- Cohen, J., Krishnamoorthy, G. and Wright, A. (2002), "Corporate governance and the audit process", *Contemporary Accounting Research*, Vol. 19 No. 4, pp. 573-593.
- Collier, P. and Gregory, A. (1996), "Audit committee effectiveness and the audit fee", *European Accounting Review*, Vol. 5 No. 2, pp. 177-198.
- Core, J. (1997), "On the corporate demand for directors' and officers' insurance", *The Journal of Risk and Insurance*, Vol. 64 No. 1, pp. 63-87.
- Core, J. (2000), "The directors' and officers' insurance premium: an outside assessment of the quality of corporate governance", *The Journal of Law, Economics, & Organization*, Vol. 16 No. 2, pp. 449-477.
- DeFond, M., Raghunandan, K. and Subramanyam, K. (2002), "Do non-audit service fees impair auditor independence? Evidence from going concern audit opinions", *Journal of Accounting Research*, Vol. 40 No. 4, pp. 1247-1274.
- Goddard, A. and Masters, C. (2000), "Audit committees, Cadbury code and audit fees: an empirical analysis of UK companies", *Managerial Auditing Journal*, Vol. 15 No. 7, pp. 358-371.
- Gompers, P., Ishii, J. and Metrick, A. (2003), "Corporate governance and equity prices", *The Quarterly Journal of Economics*, Vol. 118 No. 1, pp. 107-155.
- Goodwin-Stewart, J. and Kent, P. (2006), "Relation between external audit fees, audit committee characteristics and internal audit", *Accounting and Finance*, Vol. 46 No. 3, pp. 387-404.
- Gow, I., Ormazabal, G. and Taylor, D. (2010), "Correcting for cross-sectional and time-series dependence in accounting research", *The Accounting Review*, Vol. 85 No. 2, pp. 483-512.
- Griffin, P., Lont, D. and Sun, Y. (2008), "Corporate governance and audit fees: evidence of countervailing relations", *Journal of Contemporary Accounting and Economics*, Vol. 4 No. 1, pp. 18-49.

- Griffith, S. (2006), "Uncovering a gatekeeper: why the SEC should mandate disclosure of details concerning directors' & officers' liability insurance policies", *University of Pennsylvania Law Review*, Vol. 154 No. 5, pp. 1147-1208.
- Hay, D., Knechel, W. and Wong, N. (2006), "Audit fees: a meta-analysis of the effect of supply and demand attributes", *Contemporary Accounting Research*, Vol. 23 No. 1, pp. 141-191.
- Heckman, J. (1979), "Sample selection bias as a specification error", *Econometrica*, Vol. 47 No. 1, pp. 153-161.
- Holderness, C. (1990), "Liability insurers as corporate monitors", *International Review of Law and Economics*, Vol. 10 No. 2, pp. 115-129.
- Knechel, W. and Payne, J. (2001), "Additional evidence on audit report lag", *Auditing: A Journal of Practice & Theory*, Vol. 20 No. 1, pp. 137-146.
- Knepper, W. and Bailey, D. (1993), *Liability of Corporate Officers and Directors*, Michie Company, Charlottesville, VA.
- Mitra, S., Hossian, M. and Deis, D. (2007), "The empirical relation between ownership characteristics and audit fees", *Review of Quantitative Finance and Accounting*, Vol. 28 No. 3, pp. 257-285.
- PCAOB (2004), "An audit of internal control over financial reporting performed in conjunction with an audit of financial statements", Standard No. 2, Public Company Accounting Oversight Board, Washington, DC.
- PCAOB (2007), "An audit of internal control over financial reporting that is integrated with an audit of financial statements", Standard No. 5, Public Company Accounting Oversight Board, Washington, DC.
- Petersen, M. (2009), "Estimating standard errors in finance panel data sets: comparing approaches", *Review of Financial Studies*, Vol. 22 No. 1, pp. 435-480.
- Pratt, J. and Stice, J. (1994), "The effects of client characteristics on auditor litigation risk judgments, required audit evidence, and recommended audit fees", *The Accounting Review*, Vol. 69 No. 4, pp. 639-656.
- Redington, W. (2005), "D&O underwriting implications of Sarbanes-Oxley", *International Journal of Disclosure and Governance*, Vol. 2 No. 2, pp. 151-158.
- Seetharaman, A., Gul, F. and Lynn, S. (2002), "Litigation risk and audit fees: evidence from UK firms cross-listed on US markets", *Journal of Accounting and Economics*, Vol. 33 No. 1, pp. 91-115.
- Simunic, D. (1980), "The pricing of audit services: theory and evidence", *Journal of Accounting Research*, Vol. 18 No. 1, pp. 161-190.
- Stice, J. (1991), "Using financial and market information to identify pre-engagement factors associated with lawsuits against auditors", *The Accounting Review*, Vol. 66 No. 3, pp. 516-533.
- St Pierre, K. and Anderson, J. (1984), "An analysis of the factors associated with lawsuits against public accountants", *The Accounting Review*, Vol. 59 No. 2, pp. 242-263.
- Towers Perrin (2002), *2002 Directors and Officers Liability Survey: Executive Summary of US and Canadian Results*, available at: www.towersperrin.com/tp/getwebcachedoc?webc=TILL/USA/2003/200304/DO_summary2002a.pdf (accessed 12 May 2008).
- Towers Perrin (2003), *2003 Directors and Officers Liability Survey: Executive Summary of US and Canadian Results*, available at: www.towersperrin.com/tillinghast/publications/reports/Directors_and_Officers_2003/D_O_2003_Exec_Summary.pdf (accessed 12 May 2008).

Towers Perrin (2004), *Directors and Officers Liability Survey: Executive Summary of US and Canadian Results*, available at: www.towersperrin.com/tp/getwebcachedoc?webc=TILL/USA/2004/200412/2004_DO_Exec_Sum.pdf (accessed 12 May 2008).

Tsui, J., Jaggi, B. and Gul, F. (2001), "CEO domination, growth opportunities, and their impact on audit fees", *Journal of Accounting, Auditing & Finance*, Vol. 16 No. 3, pp. 189-208.

About the authors

Hyeesoo H. Chung is an Assistant Professor of accounting at Arizona State University. She received her PhD in accounting from Purdue University in 2004. Her research areas are audit, financial reporting, and disclosure quality.

Jinyoung P. Wynn is an Associate Professor of accounting at Louisiana Tech University. She received her PhD in accounting from Purdue University in 2005. Her research interests include financial reporting, corporate governance, and disclosures. Jinyoung P. Wynn is the corresponding author and can be contacted at: jwynn@latech.edu