Directors' and Officers' Liability Insurance and Aggressive Tax-Reporting Activities: Evidence from Canada*

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ABSTRACT

This paper examines the relationship between directors' and officers' liability insurance (D&O insurance) and firms' aggressive tax reporting. Using large Canadian public companies listed on the TSX300 and relying on several measures to capture aggressive tax-reporting activities, including GAAP effective tax rates, cash effective tax rates, and the total and residual book-tax differences, I find that D&O insurance exhibits a strong negative relationship with the GAAP effective tax rates and a strong positive relationship with both the total and residual book-tax differences. However, there is generally no evidence showing that D&O insurance is associated with the cash effective tax rates. I interpret these results as indicating that D&O insurance reduces the tax expenses reported in the financial statements but not the actual tax paid. In other words, D&O insurance contributes to financial tax management but not to cash tax savings. Further tests in this study reveal that firms with fluctuating D&O coverage limits engage in more aggressive tax reporting than other firms, suggesting that managers may consider the level of D&O insurance that they purchase when they make aggressive tax-reporting decisions.

Keywords D&O insurance; Aggressive tax reporting; GAAP and cash effective tax rates; Total book-tax difference; Residual book-tax difference

ASSURANCE RESPONSABILITÉ DES ADMINISTRATEURS ET DES DIRIGEANTS ET COMPORTEMENT AUDACIEUX EN MATIÈRE DE DÉCLARATIONS FISCALES

RÉSUMÉ

L'auteur étudie la relation entre l'assurance responsabilité des administrateurs et des dirigeants (ARAD dans la suite) et le comportement audacieux des entreprises en matière de déclarations fiscales. En examinant un échantillon de sociétés ouvertes canadiennes qui comptent au nombre des entreprises de l'indice TSX 300 et en s'appuyant sur plusieurs mesures qui permettent de saisir les comportements

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audacieux en matière de déclarations fiscales, notamment les taux d'imposition effectifs selon les PCGR, les taux d'imposition effectifs en trésorerie et les écarts totaux et résiduels entre valeurs comptables et valeurs fiscales, l'auteur constate que l'ARAD affiche une forte relation négative avec les taux d'imposition effectifs selon les PCGR et une forte relation positive avec les écarts aussi bien totaux que résiduels entre valeurs comptables et valeurs fiscales. De façon générale, rien ne démontre toutefois que l'ARAD soit associée aux taux d'imposition effectifs en trésorerie. Selon l'interprétation qu'en fait l'auteur, ces résultats indiquent que l'ARAD réduit les charges fiscales apparaissant dans les états financiers mais non le montant réel des impôts payés. En d'autres termes, l'ARAD contribue à l'aspect financier de la gestion fiscale mais non au montant réel des économies d'impôt. L'auteur pousse plus loin les tests pour constater que les sociétés dont les plafonds de protection d'assurance fluctuent font preuve de plus d'audace que les autres sociétés dans leur comportement en matière de déclarations fiscales, ce qui semble indiquer que les gestionnaires tiendraient compte du niveau d'ARAD dont l'entreprise se dote lorsqu'ils prennent des décisions audacieuses en matière de déclarations fiscales.

Mots clés : Assurance responsabilite des administrateurs et des dirigeants, Ecart residuel entre valeurs comptables et valeurs fiscales, Ecart total entre valeurs comptables et valeurs fiscales, Comportement audacieux en matiere de declarations fiscales, Taux d'imposition effectifs selon les PCGR et en tresorerie

INTRODUCTION

Studies of corporate tax-reporting practices have been popular in accounting research in taxation, and more tax studies have examined what affects corporate tax-reporting activities. To date, the literature has shown that corporate tax-reporting activities are associated with corporate ownership such as family-owned firms, inside ownership concentration, state ownership, private versus public firms, financial reporting aggressiveness, a CEO's educational background, political connections, along with a number of firms' certain attributes, to name a few (see Hanlon and Heitzman, 2010 for a review). Dyreng, Hanlon, and Maydew (2010) conclude that CEOs, CFOs, and other key managers influence their firms' reporting tax activities. Executive incentive plans, broadly including compensations and other benefits for managers and directors, can be related to earnings management (e.g., increasing reported earnings), aggressive tax activities (e.g., reducing taxes), or both (e.g., increasing reported earnings by reducing income tax expenses reported in the financial statement). However, there are few studies exploring the relationship between executive incentive plans and firms' tax-reporting practices, and these limited studies focus solely on salary, bonus, and equity-based compensation (Phillips, 2003; Hanlon, Mills, and Slemrod, 2005; Desai and Dharmapala, 2006; Rego and Wilson, 2012; Armstrong, Blouin, and Larcker, 2012).

D&O insurance is purchased by a company to cover its directors' and officers' personal liability arising from their professional activities on behalf of the company in the event of litigation brought by outsiders such as shareholders, creditors,

governments, and other stakeholders. With the increase in litigation risks against directors and officers in recent years, D&O insurance has become a very important component of corporate incentive plans, and many public companies in Canada and the United States purchase this insurance. Egri, Gordon, and Shapiro (2006), in a survey study, document that more than 90 percent of Canadian public companies carry D&O insurance. The same results are also found for the U.S. listed firms (Baker and Griffith, 2010). Another survey study by Lin, Officer, Wang, and Zou (2013) shows that 87 percent of directors consider the availability of D&O insurance to be important when they decide to join a board. Existing studies have examined the relationship between D&O insurance and firm risk, corporate governance, post-IPO stock price, earning quality and earnings managements, financing, and cost of capital (Core, 2000; Chalmers, Dann, and Harford, 2002; Boubakri, Boyer, and Challeb, 2008; Zou, Wong, Shum, Xiong, and Yan, 2008; Kang, 2011; Lin et al., 2013; Cao and Narayanamoorthy, 2014; Weng, Tseng, Chen, and Hsu, 2014). However, there is no study thus far linking D&O insurance to tax-reporting practices. Because D&O insurance typically shields directors and officers from potential litigation risks, there is reason to believe that managers who are generously covered by this insurance are more willing to engage in risk-taking behaviors such as aggressive tax-planning activities.[1]

Existing studies on the impact of managers' and directors' compensations on firms' tax-reporting activities focus solely on salary, bonus, and equity-based compensation (Phillips, 2003; Hanlon et al., 2005; Desai and Dharmapala, 2006; Rego and Wilson, 2012; Armstrong et al., 2012). For example, Phillips (2003) examines whether CEO bonus and stock-based compensation as well as business unit-manager performance measures are associated with lower effective tax rates. Desai and Dharmapala (2006) investigate the relationship between tax sheltering, higher-powered incentives, and corporate governance and find that higher-power incentives reduce tax sheltering in poorly governed firms. Rego and Wilson (2012) argue that tax avoidance is risky and managers must be incentivized to engage in it. They analyze the relationship between a CEO's equity risk incentive and tax-reporting practices and document a negative relationship between a CEO's option portfolio and high tax risk. Finally, Armstrong et al. (2012) explore the relationship between executive compensation, including salary, bonus, stocks and options, and tax planning. They find that the compensation of tax directors is strongly related to GAAP effective tax rates but not to book-tax gap or cash effective tax rates. They argue that the results imply that tax directors are motivated to reduce tax expenses reported in the financial statements.

There are no existing studies that link D&O insurance, an important component of a corporate compensation and incentive plan, to tax-reporting

1. In defining aggressive tax-planning activities, I follow Hanlon and Heitzman (2010) and broadly include any transactions or activities that reduce tax expenses or liabilities. I do not distinguish between legitimate tax-planning activities or abusive/questionable avoidances that are likely to be challenged by tax authorities.

practices. This paper seeks to fill this gap by exploring the relationship between D&O liability insurance and firms' tax-reporting practices, measured by a few proxies. I hypothesize and find evidence that D&O insurance is associated with aggressive tax-reporting activities—a finding not previously documented in the literature. Using large Canadian public companies for the time period 2003–2012, this study documents that high levels of D&O insurance coverage are associated with aggressive tax reporting, measured as the annual GAAP effective tax rate, the total book-tax gap, and the residual book-tax gap. However, there is generally no evidence showing that D&O insurance is associated with the cash effective tax rates. I interpret these results as indicating that D&O liability insurance reduces the tax expenses reported in the financial statements but not the actual tax paid. In other words, the D&O liability insurance contributes to financial tax management but not to cash tax savings. Further tests in this study reveal that firms with fluctuating D&O coverage limits engage in more aggressive tax reporting than other firms, suggesting that managers may consider the level of D&O insurance policy they purchase when they make aggressive tax-reporting decisions.

To the best of my knowledge, this paper is the first study that investigates the effect of a D&O insurance policy on aggressive tax planning and tax avoidance. It contributes to a better understanding of the impact of corporate incentive plans on firms' aggressive tax practices. It also extends the D&O insurance literature by documenting a relationship between corporate D&O insurance and aggressive tax reporting.

The balance of this paper is organized as follows. Literature Review and Hypothesis Development reviews current literature on D&O insurance and develops the hypothesis. Empirical Design designs the empirical models and describes sample selections and variables. Empirical Analysis presents the testing results. Finally, a conclusion and summary is presented in Conclusion and Summary.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

The 1985 federal corporate law (the Canada Business Corporations Act), allows a company to indemnify its directors and officers for legal costs as long as they have performed their duties honestly, in good faith, and in the best interest of the company. A typical D&O insurance policy provides the following coverage (Donley and Kent, 2008; Lin et al., 2013; Cao and Narayanamoorthy, 2014). First, it provides personal coverage (Side A coverage), which covers the amounts that the directors and officers are legally obligated to pay for claims made for wrongful acts when the company is unable or unwilling to pay. Second, it provides corporate reimbursement coverage (Side B coverage), which reimburses the company when it has indemnified its directors and officers in respect of losses incurred by their wrongful acts.

Side A coverage will be triggered when the company is unable or unwilling to indemnify its directors and officers. For example, an insolvent company would be unable to provide such indemnity. Side B coverage can be triggered only when the company is legally permitted to pay for the losses. If the company is not permitted to indemnify (for example, the directors and officers are sued by the company), Side A coverage will be triggered.

D&O insurance is generally written on an annual basis and responds to all claims made during the one-year period. It specifies the maximum amount for which the insurer is liable to pay for claims made during the period (Donley and Kent, 2008).

D&O insurance becomes an important component of a company's incentive plan and is an integral part of corporate governance because it changes the liability risk profile of a company's directors and officers and therefore affects their decisions in business activities. With the increase in litigation risks against directors and officers in recent years, D&O insurance has attracted attention from both academics and businesses. There are a handful of studies investigating the relationship between D&O insurance and firm risk, corporate governance, post-IPO stock prices, cost of capital, and the impact of D&O insurance on earnings management (Core, 2000; Chalmers et al., 2002; Boubakri et al., 2008; Chung and Wynn, 2008; Zou et al., 2008; Kang, 2011; Lin et al., 2013; Cao and Narayanamoorthy, 2014; Weng et al., 2014). For instance, Core (2000) argues that a firm's D&O insurance coverage will reveal valuable information regarding its corporate governance status. Poor governance increases litigation risk and thus the insurers will charge a high insurance premium. The study finds that a D&O premium is negatively associated with the quality of corporate governance for Canadian firms.

Chalmers et al. (2002) examine the U.S. firms that went public between 1992 and 1996 and find that the three-year post-IPO stock prices are negatively associated with the D&O policies purchased at the time of the IPO. They argue that managers behave opportunistically and incorporate their inside information regarding the overvaluation at the IPO in D&O insurance decisions.

Lin et al. (2013) argue that since D&O insurance can protect directors and officers against claims brought by outsiders, thereby lowering the deterrent effect of litigation, it is logical to expect that D&O insurance could encourage directors and officers to engage in more risk-taking behaviors. On knowing this, lenders would charge higher prices to protect against high default by demanding a large loan spread. Their study finds that a high level of D&O insurance coverage is associated with large loan spreads.

A few existing studies examine the association between D&O insurance and earnings management (Boubakri et al., 2008; Chung and Wynn, 2008; Cao and Narayanamoorthy, 2014; Weng et al., 2014). The basic idea is that managerial opportunism embedded in earnings management is costly to the management due to the potential litigation risks arising from the outside stakeholders, such as the

shareholders. Since D&O insurance can protect the legal liability of the management against such risks, the management will be more likely to manage earnings if they are protected by D&O insurance. Boubakri et al. (2008) find that better insured managers are engaging in more accrual-based earnings manipulation around seasoned equity offerings in Canada, and they conclude that D&O insurance encourages managerial opportunistic behavior and reduces earnings quality. Chung and Wynn (2008) find that Canadian firms with high D&O insurance coverage generally recognize bad news in a less timely manner and have less earnings conservatism. Using the sample of Taiwanese firms, Weng et al. (2014) also find that excess D&O insurance coverage is the primary factor behind management's accrual-based earnings manipulation behavior; Cao and Narayanamoorthy (2014) document that the U.S. firms with financial restatements or with lower earnings quality pay higher D&O insurance premiums.

This paper examines tax reporting (tax accounts) and distinguishes it from the above earnings management studies, which examine accrual-based earnings management or which examine accounts other than tax accounts. Tax accounts, as discussed by Graham, Raedy and Shackelford (2012), have unique features compared with other accounts. For example, tax accounts are based on both accounting principles and tax codes, and tax information can be used by stakeholders, including tax authorities. To the best of my knowledge, this paper is the first study that examines the effect of D&O liability insurance on firms' tax-reporting activities.

Tax expenses represent the largest cost for firms. Engaging in aggressive tax activities will reduce their tax expenses and increase their net income and cash flow. However, as argued by Rego and Wilson (2012) and Badertscher, Katz and Rego (2010), tax aggressive practices are one of the riskier activities as they impose huge costs on firms and managers, and risk-averse managers should be motivated to invest in such activities. Since D&O insurance can reduce risk for the managers to the extent that it is used to protect directors and officers against claims brought by outsiders, I expect that D&O insurance could encourage directors and officers to engage in more risk-taking behaviors including aggressive tax-reporting practices.

D&O insurance is purchased by the company to shield directors and officers from lawsuits brought by stakeholders. The potential lawsuits can be brought from shareholders, employees, and customers. Aggressive tax-reporting activities can be very costly to the managers, owing to the above litigation risks.[2]

2. Tax avoidance can trigger lawsuits. For example, in 2016, a shareholder of Caterpillar Inc. filed a lawsuit against Caterpillar's board of directors and auditor, claiming that they breached the fiduciary duties by approving a plan to use a foreign subsidiary to avoid U.S. taxes. In March 2014, a report by the U.S. Senate Permanent Subcommittee on Investigations said that the company set up a subsidiary in Switzerland in 1999. Subsequently, for 10 years, the company managed to redirect a total amount of $8 billion in profits to the subsidiary, thus evading $2.4 billion in U.S. taxes. (Source: C. Germaine. "Caterpillar Hit with Derivative Suit over $2.4B Tax Evasion". Feb 26, 2016, available at www.law360.com/articles/764629/caterpillar-hit-with-derivative-suit-over-2-4b-tax-evasion).

Furthermore, aggressive tax schemes can be designed to be fairly complicated and managers are reluctant to disclose the details of such schemes to avoid scrutiny by outsiders. That is, these aggressive tax schemes may not have adequate disclosures. Indeed, Kubick, Lynch, Mayberry, and Omer (2014) find that firms with a high level of tax avoidance are likely to receive a tax-related SEC comment letter requiring an increase in disclosure quality. Therefore, tax aggressiveness can lead to inadequate disclosure.

Meanwhile, tax aggressiveness can also lead to financial restatement. Magro and Nutter (2012) argue that tax functions, such as tax judgments and tax decision-making settings, are a leading cause of internal control weakness and financial restatements. Graham, Hanlon, Shevlin, and Shroff (2014) find that financial restatement is ranked among the top five factors that explain why firms do not engage in tax planning and avoidance. Inadequate disclosures and financial restatements arising from aggressive tax transactions can trigger lawsuits. As documented by Egri et al. (2006) in a survey for Canadian listed firms, the greatest potential sources of claims related to D&O liability are inadequate disclosures or inaccurate disclosures. Donley and Kent (2008) report that shareholder litigation for misrepresentation in documents and statements and for failure to disclose material changes is the major source of D&O liability for listed firms in the United States. Finally, Cao and Narayanamoorthy (2014) indicate that, according to the Tillinghast survey (Tillinghast-Towers Perrin, 2013), inadequate and inaccurate disclosures were responsible for over 40 percent of D&O claims in the United States in 2002. Therefore, directors and officers incline to protect themselves against litigation and personal financial liability that result from engaging in tax aggressiveness. This is where D&O insurance becomes valuable to directors and officers.

This study examines whether D&O insurance is associated with aggressive tax activities. Because D&O insurance typically covers managers' liabilities and mitigates litigation risk, managers who are generously covered by this insurance will be motivated to engage in more risk-taking behaviors, such as adopting aggressive tax-planning strategies. I thereby specify the following hypothesis:

HYPOTHESIS 1. *There is a positive relationship between D&O insurance and aggressive tax-reporting activities, ceteris paribus.*

In the next section, I develop the regression model to test the hypothesis.

EMPIRICAL DESIGN

Sample and Data Collection

This study uses Canadian data since Canadian public companies are required to disclose information related to their D&O insurance policies. I collect data for large Canadian public companies listed on the TSX300 between 2003 and 2012. I

select firms listed on the TXS300 because large firms generally disclose complete and detailed information about their D&O insurance policies. Financial data have been collected from the COMPUSTAT database, accompanied by the System for Electronic Document Analysis and Retrieval (SEDAR) online database. Information on D&O insurance policies, including D&O coverage limits purchased by the firms and annual premiums paid, has been hand-collected from management information circulars on the SEDAR online database. Information on board directors, board structures, and executive compensation plans has also been hand-collected from management information circulars on the SEDAR online database.

The firms used for this study have to meet the following three conditions: (i) financial statements are available on COMPUSTAT/SEDAR between 2003 and 2012; (ii) information about D&O insurance policy coverage limits and premiums paid is disclosed in the management information circulars between 2003 and 2012; and (iii) they are not financial institutions, partnerships, income trusts, or income funds because they are subject to specific regulations or taxes.[3] My final sample consists of 62 firms with 620 firm-year observations. Table 1 reports the sample selection. For this sample, the untabulated results show that 59 firm-year observations (10 percent) have zero D&O insurance.[4] Among these observations, three firms (5 percent) did not carry D&O insurance for the 10-year sample time periods. The other firms generally did not purchase D&O insurance in the earlier years but purchased it later.[5] I further check the firms that are not carrying D&O insurance and find that almost all of these firms are audited by the Big4.

Regression Model

To determine the relationship between D&O insurance and tax-reporting activities and to test the hypothesis, I design the following cross-sectional regression model:

3. For example, before 2007, distributions made by the income trusts or income funds to unit holders were tax deductible for the trusts and taxed at the unitholders' level, which is different from the tax treatment on distributions made by corporations to shareholders (i.e., dividends).
4. Insurance carried by auditors and lawyers generally cannot substitute for D&O insurance since shareholders sometimes file lawsuits against both auditors and the managers. There are few alternatives to D&O insurance and this is why most publicly traded firms in Canada and the United States purchase D&O insurance.
5. Firms could purchase incomplete D&O insurance. For example, some firms in the United States purchase incomplete D&O, which is called a limited form of D&O, that is, they purchase a part of the D&O insurance. Motivations for purchasing incomplete insurance could differ from those for purchasing complete insurance. Unfortunately, firms only disclose the coverage limit, premium paid, and/or deductible amount. They do not disclose details about the coverage and what categories of the insurance they purchase. Hence I cannot separate firms with incomplete D&O insurance from those with complete insurance.

TABLE 1
Sample selection

Firm-year observations listed on TSX300	3,000
Less: Observations for partnerships, income trusts/funds, or financial institutions	(540)
Less: Observations for firms with no audited financial statements or management information circulars in any years between 2003 and 2012	(1,650)
Less: Observations for firms with missing information about D&O insurance policy in the management information circulars in any years between 2003 and 2012	(190)
Final sample	620

$$TAX_{it} = \alpha_0 + \alpha_1 D\&O_{it} + \sum\nolimits_k \pi_k CONTROL_{it} + Industry\ \&\ Year\ dummies + \varepsilon_{it}, \quad (1)$$

where *TAX* represents tax-reporting activities, measured by several proxies discussed below; *D&O* represents D&O insurance policy, measured as coverage limit or premium paid over total assets; and *CONTROL* represents a set of control variables.

D&O insurance can be measured in two ways, based on the prior D&O insurance literature (Core, 2000; Kang, 2011; Lin et al., 2013; Cao and Narayanamoorthy, 2014; Weng et al., 2014). They are: (i) D&O insurance coverage limits purchased by the firm, and (ii) annual premiums paid by the firm, scaled by total assets. I use both measures and present the results for both measures.

I control for other firm characteristics that could potentially affect a firm's tax-reporting activities as documented in previous studies. Specifically, I include the following control variables: firm size (*SIZE*), measured as the log of total assets, based on the findings in Zimmerman (1983), Ronen and Aharoni (1989), Omer, Molloy, and Ziebart (1993), and Zeng (2010); return-on-assets (*ROA*), measured as net earnings over total assets (Dyreng, Hanlon, and Maydew, 2008; Chen, Chen, Cheng, and Shevlin, 2010; Lennox, Lisowsky, and Pittman, 2013; Kim and Zhang, 2016); leverage (*LEV*), measured as the sum of short-term and long-term debts over total assets (Stickney and McGee, 1982; Porcano, 1986; Chen et al., 2010); inventory intensity (*INV*), the ratio of inventory to total assets (Gupta and Newberry, 1997; Adhikari, Derashid, and Zhang, 2006; Zeng, 2010); capital intensity (*FIX*), the ratio of gross property, plant, and equipment to total assets (Wu, Wang, Lin, and Li, 2007; Wu, Wang, Gillis, and Wei, 2012); loss carry-forward (*LOSS*), measured as net loss carry-forward over total assets (Chen et al., 2010; Kim and Zhang, 2016); and foreign operation (*FOR*), measured as pre-tax foreign income over total assets (Rego, 2003; Higgins, Omer, and Phillips, 2015). In addition, industry and year dummies are included in the models to control for potential industry and year-fixed effects, for example, potential variation in tax policies across industries and across years (Rego, 2003; Higgins et al., 2015).

Measures of Tax-Reporting Activities

Since there is no universally accepted measurement for tax-reporting activities in the literature, I measure a firm's tax-reporting practices in four ways based on prior tax research (e.g., Adhikari et al., 2006; Desai and Dharmapala, 2006; Chen et al., 2010; Robinson, Sikes, and Weaver, 2010; Lim, 2011; Armstrong et al., 2012; Lennox et al., 2013; Graham et al., 2014; Waegenaere, Sansing, and Wielhouwer, 2015). They are: (i) the GAAP effective tax rate, (ii) cash effective tax rate, (iii) total book-tax gap, and (iv) residual book-tax gap.

The GAAP effective tax rate (*GAAP ETR*) is defined as total income tax divided by pre-tax income. Total income tax includes all income tax imposed by domestic and foreign governments and is the sum of current income tax and deferred income tax. It is presented on the income statement. I use total income tax to calculate *GAAP ETR* since Canadian firms do not disclose current income tax and deferred income tax separately. Note that the pre-tax income cannot be negative. In addition, I exclude the firm-year observations with the GAAP effective tax rate less than zero or greater than one. The effective tax rate may differ from the statutory tax rate for several reasons: (i) tax rules generally specify tax reductions and/or tax credits for certain business activities or transactions; (ii) pre-tax accounting income rather than taxable income is used as the denominator of *GAAP ETR*; (iii) firms can reduce tax liability by engaging in tax-planning activities; and (iv) firms may avoid or evade taxes.

The cash effective tax rate (*CASH ETR*) is defined as actual cash tax paid divided by pre-tax income. Similar to *GAAP ETR*, I exclude observations with negative pre-tax income or with the cash effective tax rate less than zero or greater than one. Cash tax paid represents cash payments for income taxes applicable to both current and prior years. It is presented on the statement of cash flow. Unlike the *GAAP ETR*, *CASH ETR* shows the deferral of cash tax payments. A caution for using *CASH ETR* is that it contains mismatched measurement errors since the numerator includes not only current tax payments but also tax refunds or settlements with a tax agency for previous years, as well as estimated tax payments for future years.

Lower (higher) GAAP and cash ETRs indicate more (less) tax aggressiveness.

The total book-tax gap (*BTD*) is defined as pre-tax earnings less taxable income, deflated by total assets at the beginning of the year. Pre-tax earnings represent operating and non-operating income before provisions for income taxes and minority interest. This item is reported in the company's income statement. Taxable income is calculated as total income tax over statutory tax rate (I exclude observations with a net loss and/or negative total income tax since the tax rate used to compute taxable income is unclear). The statutory tax rate is the sum of the federal and provincial tax component after general rate reductions but before specific tax credits (e.g., credit for R&D).[6] Since the total income tax is the sum of

6. Source: KPMG corporate tax rates tables, https://home.kpmg.com/xx/en/home/services/tax/tax-tools-and-resources/tax-rates-online/corporate-tax-rates-table.html.

the current income tax and deferred income tax, where deferred income tax indicates the temporary difference between accounting principle and tax rules, the total book-tax gap measures the permanent difference between accounting and tax treatments. The total book-tax gap is also called the permanent book-tax gap.

The fourth measurement of tax reporting is the so-called residual book-tax gap (*BTD-RES*), similar to that used by Desai and Dharmapala (2006), Frank, Lynch and Rego (2009), Chen et al. (2010), and Lim (2011). Since the total book-tax gap is measured as pre-tax accounting earnings less taxable income, it can be inflated by either increasing accounting income or decreasing taxable income, or both. In other words, it is possible that the book-tax gap captures not only tax aggressiveness but also earnings management.

Prior literature documents that managers covered by a high level of D&O insurance will engage in opportunistic behavior such as earnings management and earnings manipulation (Boubakri et al., 2008; Chung and Wynn, 2008; Weng et al., 2014; Cao and Narayanamoorthy, 2014). Therefore, the positive relation between D&O insurance and the total book-tax gap can be driven by earnings management.

To exclude earnings management from the book-tax gap, I measure the so-called residual book-tax gap, used by Desai and Dharmapala (2006), Chen et al. (2010), and Lim (2011). That is, I calculate discretionary accruals as the proxy for earnings management (Dechow, Sloan, and Sweeney, 1995; Kothari, Leone, and Wasley, 2005). The discretionary accruals (DA) are calculated as the residuals from the regression:

$$\frac{TA_{it}}{ASSET_{it-1}} = \gamma_0 \frac{1}{ASSET_{it-1}} + \gamma_1 \frac{\Delta SALE_{it} - \Delta A/R_{it}}{ASSET_{it-1}} + \gamma_2 \frac{PPE_{it}}{ASSET_{it-1}} + \gamma_3 ROA_{it} + \varepsilon_{it}, \quad (2)$$

where TA equals total accruals, defined as earnings before extraordinary items net of cash flows from operation; $ASSET$ equals total assets; $\Delta SALE$ equals change in revenues; $\Delta A/R$ equals change in account receivables; and PPE equals gross property, plant, and equipment.

Next, I regress the total book-tax gap (BTD) on the discretionary accruals (DA) to identify the component of the total book-tax gap that cannot be explained by earnings management.

$$BTD_{it} = \delta_1 DA_{it} + u_i + \varepsilon_{it}, \quad (3)$$

where u_i is the average value of the residual for firm i from regressing $BTD_{it} = \delta_1 DA_{it} + \varepsilon_{it}$ over the sample time period of 2003 to 2012.

The residuals from model (3) are the component of the book-tax gap that cannot be explained by earnings management and so are identified as the

measurement for tax aggressiveness. This residual book-tax gap (*BTD-RES*) is therefore denoted as:

$$BTD - RES_{it} = u_i + \varepsilon_{it}. \quad (4)$$

Higher (lower) total book-tax gap (*BTD*) and residual book-tax gap (*BTD-RES*) indicate more (less) tax aggressiveness.

The Appendix summarizes the measures for aggressive tax reporting and other variables.

Endogeneity of D&O Insurance

As argued by the existing studies on the relationship of incentives and tax-reporting activities, the incentive plans can be endogenous since firms have already adjusted to the optimal incentive plans (Phillips, 2003; Rego and Wilson, 2012). To address this issue, I perform two-stage least squares, where I first use D&O insurance as the dependent variable.

D&O insurance can be a proxy for a number of other variables that could affect aggressive tax-reporting practices, including firm size, profitability, leverage, capital intensity, governance characteristics, and executive compensation, based on prior studies on D&O insurance (Core, 2000; Kaltchev, 2006; Chung and Wynn, 2008; Weng et al., 2014). In addition, lagged D&O insurance is also included in the model as an independent variable. In the first stage of least squares, D&O insurance is estimated as follows:

$$D\&O_{it} = \theta_0 + \theta_1 D\&O_{it-1} + \theta_2 SIZE_{it} + \theta_3 ROA_{it} + \theta_4 LEV_{it} + \theta_5 FIX_{it} + \theta_6 CG + \theta_7 EXEC + Industries\ \&\ Year\ dummies + \varepsilon_{it}. \quad (5)$$

CG represents a broad array of corporate governance variables, including (i) the percentage of independent directors; (ii) the percentage of female directors; (iii) an indicator variable, equal to one if the CEO is not the chair of the board, and zero otherwise; and (iv) the percentage of shares held by the CEO.

EXEC represents two measures of executive incentive compensation, including the percentage of salary over total compensation and the percentage of equity-based compensation (options, stocks, and other equity-related compensations) over total compensation. Total compensation is the sum of salary, equity-based compensation, and other compensation (i.e., bonus, pension value, non-equity compensation, etc.). Information on governance and executive compensation are collected from 2012 management information circulars on the SEDAR online database.

D&O insurance is estimated from the above regression. In the second stage of the least squares, I do the following regression to determine the relationship between D&O insurance and tax-reporting practices. It is similar to model (1) except that the estimated D&O insurance is used as an independent variable in the model.

$$TAX_{it} = \mu_0 + \mu_1 ED\&O_{it} + \sum\nolimits_k \eta_k CONTROL_{it} + Industry\ \&\ Year\ dummies + \varepsilon_{it}, \quad (6)$$

where *ED&O* is estimated from model (5) in the first stage of least squares.

EMPIRICAL ANALYSIS

Data Statistics and Primary Results

Table 2 presents the descriptive statistics of all major variables. It shows that, on average, *GAAP ETR* is 27.6 percent, which is similar to the Canadian statutory tax rates of 26 percent to 36.6 percent between 2003 and 2012. The *CASH ETR*, on average, is 22.3 percent, which is less than the statutory rates. The standard deviation for *CASH ETR* (0.165) is larger than that for *GAAP ETR* (0.12), suggesting that *CASH ETR* for my sample firms exhibits higher variation than *GAAP ETR*. This is consistent with Hanlon and Heitzman (2010). The total book-tax gap (*BTD*) and residual book-tax gap (*BTD-RES*), on average, are positive and are equal to 0.016 and 0.019, respectively, implying that firms, on average, report more accounting income than taxable income.

Table 2 also reveals that on average, D&O insurance coverage limit and premiums are $77.72 and $0.697 million, respectively. D&O insurance coverage limit and premiums, deflated by total assets, on average, are 0.022 and 0.0002, respectively.

In addition, Table 2 documents the descriptive statistics of firm characteristics. On average, profitability (*ROA*) is 0.04; leverage (*LEV*) is 0.216; firm size (*SIZE*) is 9.577; inventory intensity (*INV*) is 0.084; capital intensity (*FIX*) is 0.78; foreign income (*FOR*) is 0.006; and loss carry-forward (*LOSS*) is 0.058.

The Pearson correlation matrix reported in Table 3 shows the correlations between a firm's characteristics variables. The maximum absolute value of the correlation is 0.403, between *FIX* and *SIZE*. The minimum absolute value of the correlation is 0.01, between *FOR* and *LEV*.

Tables 4 and 5 present the main results from model (6).

Table 4 reports the results when D&O insurance is measured as the D&O coverage limit, estimated from model (5), the first stage of least squares. Column 2 shows the results where *GAAP ETR* is regressed on D&O insurance and other control variables; column 3 shows the results where *CASH ETR* is the dependent variable; column 4 shows the results where the total book-tax difference (*BTD*) is regressed on D&O insurance and other control variables; and column 5 shows the results where the residual book-tax difference (*BTD-RES*) is regressed on D&O insurance and other control variables.

Table 4 shows that, consistent with the hypothesis, the coefficient on D&O insurance is negative and statistically significant for three measures of aggressive tax-

TABLE 2
Descriptive statistics

Variables	Mean	Median	SD	1st quartile	3rd quartile
GAAP ETR	0.276	0.276	0.120	0.215	0.330
CASH ETR	0.223	0.211	0.165	0.102	0.300
BTD	0.016	0.012	0.048	0.000	0.026
BTD-RES	0.019	0.014	0.048	0.002	0.028
D&O1 (Million $)	77.72	50	65.31	30	100
D&O2 (Million $)	0.697	0.438	0.791	0.188	0.939
D&O1	0.022	0.016	0.032	0.008	0.028
D&O2	0.0002	0.0001	0.0003	0.00005	0.0002
SIZE	9.577	9.482	0.638	9.157	10.126
LEV	0.216	0.214	0.142	0.109	0.321
INV	0.084	0.050	0.095	0.013	0.121
FIX	0.780	0.771	0.383	0.507	1.072
ROA	0.040	0.044	0.101	0.021	0.073
FOR	0.006	0	0.024	0	0
LOSS	0.058	0	0.129	0	0.053

Notes:

D&O1 (Million $): D&O coverage limit (million $)
D&O2 (Million $): D&O insurance premium (million $)
D&O1: D&O coverage limit over total assets
D&O2: D&O insurance premium over total assets

TABLE 3
Pearson correlation matrix

Variables	*SIZE*	*LEV*	*INV*	*FIX*	*FOR*	*ROA*	*LOSS*
SIZE	1						
LEV	0.201	1					
INV	−0.189	−0.142	1				
FIX	0.403	0.269	−0.360	1			
FOR	0.075	−0.010	−0.030	−0.084	1		
ROA	0.267	−0.092	0.047	0.111	0.216	1	
LOSS	−0.260	−0.091	−0.010	−0.152	−0.015	−0.298	1

reporting activities—*GAAP ETR*, *BTD* and *BTD-RES*, suggesting that firms engage in more aggressive tax-reporting activities if they have higher D&O insurance coverage.

TABLE 4
Primary testing results where D&O is coverage limit over total assets

Model: $TAX_{it} = \mu_0 + \mu_1 ED\&O_{it} + \sum_k \eta_k CONTROL_{it} + Industry\ \&\ Year\ dummies + \varepsilon_{it}$ (6)

Variable	(1) Predicted sign	(2) *GAAP ETR*	(3) *CASH ETR*	(4) *BTD*	(5) *BTD-RES*
Intercept		0.223	0.271	−0.029	−0.015
		(1.57)	(1.40)	(−0.60)	(−0.33)
ED&O	−, −, +, +	−0.863**	−0.712	0.351***	0.292**
		(−2.20)	(−1.34)	(2.60)	(2.20)
SIZE	?, ?, ?, ?	0.008	0.007	0.001	−0.000
		(0.59)	(0.36)	(0.15)	(−0.06)
LEV	?, ?, ?, ?	−0.060	−0.051	0.008	0.007
		(−1.07)	(−0.68)	(0.43)	(0.39)
INV	?, ?, ?, ?	0.007	0.063	−0.064**	−0.073**
		(0.08)	(0.54)	(−2.18)	(−2.51)
FIX	?, ?, ?, ?	0.011	−0.013	−0.011	−0.010
		(0.54)	(−0.47)	(−1.58)	(−1.43)
ROA	−, −, +, +	−0.427***	−0.76***	0.504***	0.498***
		(−3.66)	(−5.20)	(12.95)	(12.99)
FOR	−, −, +, +	−0.039	0.296	−0.022	−0.016
		(−0.15)	(0.83)	(−0.24)	(−0.18)
LOSS	?, ?, ?, ?	−0.014	−0.147*	−0.000	−0.001
		(−0.25)	(−1.88)	(−0.01)	(−0.04)
Industry		Yes	Yes	Yes	Yes
Year		Yes	Yes	Yes	Yes
Adj. R^2		0.07	0.1	0.32	0.32
Obs		502	489	517	517

Notes:

***, **, and * represent significance levels of 0.01, 0.05, and 0.10, respectively based on two-tailed *t*-test.

However, column 3 in Table 4 shows that *ED&O* is negatively associated with *CASH ETR*, but not statistically significant. In other words, there is no significant relationship between D&O insurance coverage and *CASH ETR*.

A couple of control variables are also significant. For example, *ROA* is negatively (positively) associated with *GAAP ETR* and *CASH ETR* (*BTD* and *BTD-RES*), which is consistent with Dyreng et al. (2008) and Lennox et al. (2013), indicating that more profitable firms have more aggressive tax reporting.

TABLE 5

Primary testing results where D&O is insurance premium over total assets

Model: $TAX_{it} = \mu_0 + \mu_1 ED\&O_{it} + \sum_k \eta_k CONTROL_{it} + Industry\ \&\ Year\ dummies + \varepsilon_{it}$ (6)

Variable	(1) Predicted sign	(2) *GAAP ETR*	(3) *CASH ETR*	(4) *BTD*	(5) *BTD-RES*
Intercept		0.158	0.175	−0.018	−0.015
		(1.24)	(0.54)	(−0.42)	(−0.36)
ED&O	−, −, +, +	−88.69**	6.827	45.89***	43.93***
		(−2.05)	(0.12)	(3.09)	(3.01)
SIZE	?, ?, ?, ?	0.016	0.024	−0.001	−0.001
		(1.27)	(1.37)	(−0.25)	(−0.24)
LEV	?, ?, ?, ?	−0.096*	−0.061	0.025	0.022
		(−1.70)	(−0.81)	(1.29)	(1.18)
INV	?, ?, ?, ?	−0.032	0.036	−0.048*	−0.059**
		(−0.37)	(0.31)	(−1.66)	(−2.08)
FIX	?, ?, ?, ?	0.009	−0.013	−0.01	−0.009
		(0.46)	(−0.74)	(−1.44)	(−1.28)
ROA	−, −, +, +	−0.448***	−0.748***	0.517***	0.511***
		(−3.81)	(−5.06)	(13.19)	(13.26)
FOR	−, −, +, +	0.091	0.257	−0.093	−0.086
		(0.33)	(0.69)	(−0.99)	(−0.93)
LOSS	?, ?, ?, ?	0.021	−0.145*	−0.018	−0.016
		(0.36)	(−1.79)	(−0.92)	(−0.83)
Industry		Yes	Yes	Yes	Yes
Year		Yes	Yes	Yes	Yes
Adj. R^2		0.07	0.1	0.32	0.33
Obs		502	489	517	517

Notes:

***, **, and * represent significance levels of 0.01, 0.05, and 0.10, respectively, based on two-tailed *t*-test.

Consistent with Gupta and Newberry (1997), Adhikari et al. (2006), and Zeng (2010), the coefficients on *INV* are negative and significant for *BTD* and *BTD-RES*, suggesting that inventory-intensive firms face higher tax liability.

Table 4 also shows that *LOSS* is negatively associated with *CASH ETR* as predicted since losses carried from other years reduce current-year tax liability (Chen et al., 2010).

Table 5 reports the results from model (6), where D&O insurance is measured as the estimated D&O insurance premiums deflated by total assets. Column 2 shows the results where *GAAP ETR* is regressed on D&O insurance and other control variables; column 3 shows the results where *CASH ETR* is the dependent variable; column 4 shows the results where the total book-tax difference (*BTD*) is regressed on D&O insurance and other control variables; and column 5 shows the results where the residual book-tax difference (*BTD-RES*) is regressed on the estimated D&O premiums and other control variables.

The results are similar to those presented in Table 4. For example, column 2 shows that the coefficient on *ED&O* is negative and statistically significant at the 0.05 level. Similarly, columns 4 and 5 show that the coefficient on *ED&O* is positive and statistically significant at the 0.01 level, indicating that firms engage in more aggressive tax-reporting practices if they pay higher D&O insurance premiums. Again, I find no relationship between *ED&O* and *CASH ETR*.

In summary, in Tables 4 and 5, in sharp contrast to the strong relationship between D&O insurance and *GAAP ETR*, *BTD*, and *RES-BTD*, I fail to find the relationship for *CASH ETR*. Putting these results together suggests that purchasing D&O insurance motivates directors and managers to reduce tax expenses reported in the financial statements but not the actual cash tax paid. In other words, the D&O insurance contributes to financial tax management but not to cash tax savings. These findings are consistent with the study by Armstrong et al. (2012), which examines the relationship between executive compensations and tax planning. They find that executive compensations reduce *GAAP ETR* but not *CASH ETR*. They argue that *GAAP ETR* is a more reliable signal of performance while *CASH ETR* is much noisier and so executives put more weight on *GAAP ETR*.

These findings are also consistent with the results from Graham et al. (2014) to the extent that managers, when they engage in tax planning or avoidance activities, care more about the effect of these activities on the financial statement outcome rather than on the actual cash tax paid.

These findings may also suggest that managers would forgo the cash tax savings from certain aggressive tax activities if these activities reduced financial income and so incurred financial reporting costs.

Additional Analyses—Change in D&O Coverage Limits over Time

A further analysis of the D&O insurance policies across the sample firms shows that the insurance premiums paid by almost all firms were fluctuating for the sample time period 2003 to 2012 and thus show no obvious trends. Nevertheless, the coverage limits change in a different way across firms. For example, a majority of firms (76 percent) have increased (or the same) coverage limits for the sample time periods. This is reasonable given the fact that litigation risk against directors and officers has increased in recent years. However, about 8 percent of

firms have decreased insurance limits for the sample time periods. The remaining firms have a coverage limit that fluctuated over the sample time periods. To investigate if the firms with decreased or fluctuating insurance coverage limits behave differently in tax-reporting practices from other firms, I add two indicator variables to model (6): *DEC-FIRM* and *FLU-FIRM,* where *DEC-FIRM* is an indicator variable, equal to one for firms with decreasing coverage limits and zero otherwise, and *FLU-FIRM* is the other indicator variable, equal to one for firms with fluctuating coverage limits and zero otherwise. Tables 6 and 7 present the regression results.

Table 6 reports the results when the *ED&O* is the estimated D&O coverage limit over total assets. As expected, the coefficient on D&O insurance coverage is negative (positive) and significant for *GAAP ETR* (*BTD* and *BTD-RES*), consistent with the hypothesis. The coefficient on *FLU-FIRM* is significantly negative in the *GAAP ETR* and positive in the total book-tax gap and residual book-tax gap, suggesting that firms with fluctuating coverage limits are more tax aggressive. The coefficient on *DEC-FIRM* is, however, not significant.

Table 7 reports the results when the *ED&O* is the estimated D&O premiums paid over total assets. The results are similar to those presented in Table 6. For example, the coefficient on *FLU-FIRM* is significantly negative in the *GAAP ETR* and positive in the total book-tax gap and residual book-tax gap. The coefficient on *DEC-FIRM* is, however, not significant.

Overall, the results shown in Tables 6 and 7 suggest that managers may strategically consider the level of D&O insurance policy they purchase when they make aggressive tax-reporting decisions.

CONCLUSION AND SUMMARY

This paper examines the relationship between D&O liability insurance and firms' aggressive tax-reporting activities. Using large Canadian public companies listed on the TSX300 and relying on several proxies for aggressive tax reporting, including *GAAP ETR*, *CASH ETR*, and the total and residual book-tax differences, I find that, consistent with the hypothesis, D&O insurance exhibits a strong negative relationship with the GAAP effective tax rates and a strong positive relationship with both the total and residual book-tax differences. However, there is no strong evidence showing that D&O insurance is associated with the cash effective tax rates. Further tests reveal that firms with fluctuating D&O coverage limits engage in more aggressive tax reporting, suggesting that managers strategically incorporate the level of D&O insurance policy they purchase when they make aggressive tax-reporting decisions.

This paper has some limitations. First, since I cannot directly observe firms' aggressive tax practices, my measures would carry measurement errors, though I use multiple measures to capture corporate aggressive tax-reporting activities. Second, the *GAAP ETR* and *BTD* are affected by accounting rules. For example,

TABLE 6
Additional testing results on the different changes in D&O coverage limits across firms

Model: $TAX_{it} = \alpha_0 + \alpha_1 ED\&O_{it} + \alpha_2 DEC\text{-}FIRM_1 + \alpha_3 FLU\text{-}FIRM_i + \sum_k \pi_k CONTROL_{it} + Industry\ \&\ Year\ dummies + \varepsilon_{it}$

Variable	(1) Predicted sign	(2) *GAAP ETR*	(3) *CASH ETR*	(4) *BTD*	(5) *BTD-RES*
Intercept		0.141	0.200	0.003	0.015
		(0.98)	(1.01)	(0.06)	(0.32)
ED&O	−, −, +, +	−0.838**	−0.695	0.334**	0.276**
		(−2.14)	(−1.30)	(2.47)	(2.08)
DEC-FIRM	?, ?, ?, ?	0.025	0.029	−0.004	−0.004
		(1.18)	(0.98)	(−0.56)	(−0.58)
FLU-FIRM	?, ?, ?, ?	−0.042**	−0.037	0.015**	0.014**
		(−2.41)	(−1.54)	(2.53)	(2.49)
SIZE	?, ?, ?, ?	0.018	0.015	−0.003	−0.004
		(1.23)	(0.76)	(−0.60)	(−0.78)
LEV	?, ?, ?, ?	−0.083	−0.074	0.013	0.012
		(−1.44)	(−0.96)	(0.65)	(0.61)
INV	?, ?, ?, ?	0.109	0.163	−0.094***	−0.102***
		(1.13)	(1.25)	(−2.86)	(−3.15)
FIX	?, ?, ?, ?	0.010	−0.013	−0.010	−0.008
		(0.48)	(−0.45)	(−1.37)	(−1.23)
ROA	−, −, +, +	−0.468***	−0.79***	0.518***	0.512***
		(−3.98)	(−5.34)	(13.18)	(13.22)
FOR	−, −, +, +	−0.006	0.334	−0.026	−0.021
		(−0.02)	(0.93)	(−0.29)	(−0.23)
LOSS	?, ?, ?, ?	−0.014	−0.147*	−0.002	−0.007
		(−0.25)	(−1.88)	(−0.09)	(−0.04)
Industry		Yes	Yes	Yes	Yes
Year		Yes	Yes	Yes	Yes
Adj. R^2		0.08	0.11	0.33	0.33
Obs		502	489	517	517

Notes:

***, **, and * represent significance levels of 0.01, 0.05, and 0.10, respectively, based on two-tailed *t*-test.

valuation allowance affects total income tax. Even though I attempt to exclude earnings management from the book-tax difference (*BTD-RES*), these measures may not capture tax aggressiveness solely.

TABLE 7

Additional testing results on the different changes in D&O coverage limits across firms

Model: $TAX_{it} = \alpha_0 + \alpha_1 ED\&O_{it} + \alpha_2 DEC\text{-}FIRM_1 + \alpha_3 FLU\text{-}FIRM_i + \sum_k \pi_k CONTROL_{it} + Industry\ \&\ Year\ dummies + \varepsilon_{it}$

Variable	(1) Predicted sign	(2) *GAAP ETR*	(3) *CASH ETR*	(4) *BTD*	(5) *BTD-RES*
Intercept		0.093	0.035	0.009	0.011
		(0.71)	(0.20)	(0.21)	(0.25)
ED&O	−, −, +, +	−97.55**	0.440	47.49***	45.58***
		(−2.24)	(0.01)	(3.19)	(3.11)
DEC-FIRM	?, ?, ?, ?	0.029	0.025	−0.006	−0.006
		(1.35)	(0.85)	(−0.83)	(−0.87)
FLU-FIRM	?, ?, ?, ?	−0.044**	−0.04*	0.016***	0.015***
		(−2.53)	(−1.65)	(2.67)	(2.60)
SIZE	?, ?, ?, ?	0.024*	0.031*	−0.004	−0.004
		(1.88)	(1.74)	(−0.99)	(−0.97)
LEV	?, ?, ?, ?	−0.123**	−0.084	0.03	0.028
		(−2.11)	(−1.07)	(1.55)	(1.45)
INV	?, ?, ?, ?	0.08	0.134	−0.083**	−0.093***
		(0.84)	(1.04)	(−2.57)	(−2.94)
FIX	?, ?, ?, ?	0.008	−0.014	−0.009	−0.008
		(0.39)	(−0.48)	(−1.26)	(−1.12)
ROA	−, −, +, +	−0.494***	−0.783***	0.531***	0.525***
		(−4.17)	(−5.24)	(13.48)	(13.53)
FOR	−, −, +, +	0.146	0.304	−0.104	−0.097
		(0.53)	(0.81)	(−1.09)	(−1.04)
LOSS	?, ?, ?, ?	0.024	−0.143*	−0.02	−0.018
		(0.42)	(−1.76)	(−1.02)	(−0.93)
Industry		Yes	Yes	Yes	Yes
Year		Yes	Yes	Yes	Yes
Adj. R^2		0.08	0.1	0.33	0.34
Obs		502	489	517	517

Notes:

***, **, and * represent significance levels of 0.01, 0.05, and 0.10, respectively, based on two-tailed *t*-test.

To the extent that the *GAAP ETR* and *BTD* are calculated based on the total income tax expenses reported in the income statement, this study sheds some light on the relationship between D&O liability insurance and earnings management.

Nevertheless, the findings in this paper suggest that D&O insurance could motivate managers to reduce tax expenses reported in the financial statement and hence increase reported after-tax earnings.

In addition, my sample firms are from TSX300. I choose TSX300 firms because these firms disclose proxy statements or management information circulars on the SEDAR online database, which generally delivers complete and detailed information about firms' D&O insurance policies, corporate governance, and executive compensations. TSX300 firms are relatively large and hence the results found in this study might not be generalized to small listed firms.

In spite of the above limitations, this study has significant implications for policy makers, corporate managers, and academics. It contributes to a better understanding of the impact of corporate incentive plans such as a D&O insurance policy on firms' aggressive tax-reporting practices. It also extends the D&O insurance literature by documenting a relationship between D&O insurance and multiple measures of aggressive tax-reporting activities. Future research could be pursued by extending the study discussed in this paper to include firms in other countries, where disclosing D&O insurance has become mandatory and litigation environments differ from that in Canada. Future studies could explore whether incomplete D&O insurance provides managers and directors with different motivations for tax reporting when firms disclose details about their D&O insurance, for example, if they purchase full insurance or less than full insurance.

APPENDIX: VARIABLE DEFINITIONS

TAX	Tax reporting activities, measured by several proxies discussed
GAAP ETR	GAAP effective tax rate, measured as total tax payable/expense on the income statement divided by pre-tax income
CASH ETR	Cash effective tax rate, measured as cash tax paid on the cash flow statement divided by pre-tax income
BTD	Total book-tax gap, measured as pre-tax earnings minus taxable income (= tax expense over statutory tax rate), deflated by total assets at the beginning of the year
BTD-RES	Residual book-tax gap, measured as the total *BTD* excluding that explained by earnings management
D&O	D&O coverage limit/premium over total assets
ED&O	Estimated *D&O* from model (5)
SIZE	Firm size, measured as the log of total assets
ROA	Profitability, measured as net earnings (losses) over total assets

(The Appendix is continued on the next page.)

APPENDIX (continued)

LEV	Leverage, measured as the sum of short-term debts and long-term borrowings, over total assets
FIX	Capital intensity, the ratio of gross property, plant, and equipment to total assets
LOSS	Loss carry-over over total assets
FOR	Pre-tax income – foreign, over total assets
SALE	Firm sales, measured as revenue over total assets
TA	Total accruals, defined as earnings before extraordinary items net of cash flows from operation
ASSET	Total assets
$\Delta SALE$	Change in revenues
$\Delta A/R$	Change in account receivables
PPE	Gross property, plant, and equipment
CG	A broad array of corporate governance variables, including (i) the percentage of independent directors; (ii) the percentage of female directors; (iii) an indicator variable, equal to one if the CEO is not the chair of the board, and zero otherwise; and (iv) the percentage of shares held by the CEO
EXEC	Measures of executive incentive compensation, including (i) the percentage of salary over total compensation and (ii) the percentage of equity-based compensation (options, stocks, and other equity-related compensation) over total compensation.
DEC-FIRM	Indicator variable, equal to one for firms with decreasing D&O coverage limits over 2003–2012, and zero otherwise
FLU-FIRM	Indicator variable, equal to one for firms with fluctuating D&O coverage limits over 2003–2012, and zero otherwise

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