Directors and Officers Liability Insurance Coverage, Tax Avoidance and Financial Crisis

by

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Abstract

With firms facing an increasing range of exposures and the resultant surging risks, directors and officers (D&O) liability insurance are available for corporations in order to mitigate or avoid potential litigation risks. However, this behaviour may cause a "moral hazard" problem in return, because insuring D&O "misbehaviours" mitigates the supervision effect of stakeholder litigation and encourages corporate risk-taking behaviours. Based on fixed effect models, this study investigates the effect of purchasing D&O liability insurance coverage on corporate tax avoidance behaviours. We find that higher insurance coverage encourages tax avoidance behaviours in non-crisis periods, instead of crisis periods. In addition, our findings document that this negative relation becomes inapparent in companies with higher profitability and lower default risk.

Key Words:

D&O Liability Insurance; Tax Avoidance; Financial Crisis

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Contents

1. Introduction

Boards of directors and executive officers are responsible for overseeing corporate operations and governance. Due to public exposure, corporate directors and officers (D&O) face various risks that often results in lawsuits, some of which may lead to personal financial losses for them. In practice, D&O liability insurance policies are therefore designed to cover liabilities for managers in order to protect them from financial losses in the cases that they are sued for 'wrongful acts' and the following slump of stock price (Ryan 2009), where the specific 'wrongful acts' are stipulated under D&O policy agreements. Typically, according to Allianz insurance (2020), some allegations are included under the policy such as breach of fiduciary duties, employment issues and insolvencies. Some other allegations are excluded such as fraud, crime, acts for private benefits, or claims alleged not during the coverage period. For example, Wynn Resorts reached a $41 million settlement in a shareholder lawsuit accusing that Steve Wynn, the former CEO of Wynn Resorts, was engaged in sexual misconducts with company employees. The securities class action lawsuit was filed on February 20, 2020 in New York. In this settlement, as allegation is claimed during the D&O policy period, Allianz, the insurer, would pay $21 million for indemnification, and Steve Wynn agreed to pay the rest $20 million (Kevin 2020). Similarly, Signet Jewelers was sued for $240 million due to the misrepresentations of the health of a credit portfolio and a scandal allegation in 2016 (Kevin 2020). On one hand, Signet was accused of the misrepresentations of an in-house lending program, which were "high-risk subprime loans" and caused huge losses. On the other hand, Sterling Jewelers, the subsidiary of Signet, was engaged in a misleading public statement about sexual harassment allegation. According to the securities, "Jock Litigation", which was an employment arbitration of Sterling Jewelers, was misleadingly minimized by defendants claiming that the litigation was just at "a few stores", while the truth was that it involved "most senior executives". According to the 10-K filing, the insurer agreed to pay $205 of $240 million, and the company would pay the remained (Lenore 2020).

In short, as Embroker insurance (2020) defined, D&O insurance is a claim-based coverage, which reimburses financial losses and defence costs for both individuals and companies. According to Kevin LaCroix (2017), the number of U.S. securities class action

litigation surged in 2016, in which year became the top annual number of securities class action lawsuit filings since 2001. Financial Times (2019) reported that, the number of federal securities actions in US in 2017&2018 exceeds 400, more than double the average number before. The defence cost for securities class actions range from $10 to $100 million. Similarly, as reported by NERA Economic Consulting, the number of class action lawsuits in Canada doubled in 2016 (Kevin 2017).

According to Allianz, the estimated worldwide D&O insurance premium accounts for nearly $10 billion (Introduction to DO insurance). Total corporate D&O liability insurance premiums are about $2.91 billion dollars per year in America (SNL Financial, 2014). Insuring D&O against allegations of "misbehaviours" is controversial due to its potential effect on accountability. In other words, such insurance may cause unintended moral hazard problems because it mitigates the supervision role of stockholder lawsuits (Baker and Griffith 2010; Gillan and Panasian 2015). It also decreases corporate reporting transparency (Wynn 2008; Chung and Wynn 2008), which encourages corporate risk-taking behaviours in turn (Boyer and Tennyson 2015; Kalelkar and Nwaeze 2015).

The literature on corporate D&O liability insurance is underdeveloped, partly because it is not mandatory for U.S. listed companies to disclose such information (Chalmers, Dan, and Harford 2002; Kalelkar and Nwaeze 2015). In Canada, however, such disclosures are mandatory, so scholars have focused on Canadian publicly listed firms. The literature documents various negative consequences of insuring D&O against potential liability, such as higher cost of equity and debt, lower abnormal return from mergers and acquisitions, lower analysts forecast optimism, and higher stock-price-crash risk (Boubakri and Bouslimi 2016; Chen, Li and Zou 2016; Lin et al. 2013, 2011; Yuan, Sun and Cao 2016). Since capital markets in the U.S. and Canada are similar, these findings could be generalizable to the U.S. as well as other jurisdictions.

To date, how D&O insurance coverage impacts corporate tax-avoidance[1] behaviours is not pinpointed in most studies (Zeng 2017). Tax avoidance are generally defined as any tax reporting practices which mitigates the companies' cash effective tax rates for a long time (Dyreng, Hanlon and Maydew 2008). It is documented that over a

[1] "Tax avoidance" is used instead of "tax evasion" or more aggressive expressions as we do not refer to any illegal conducts in this circumstance. According to Hanlon and Heitzman (2010, 127-178), the cutoff of adopting tax practices legally or not is ambiguous.

quarter of sample companies could keep the cash effective tax rate under 20% over ten-year periods (Dyreng, Hanlon and Maydew 2008), while the sample average cash effective tax rate and statutory tax rate are about 30% and 35% respectively. The finding indicates that tax avoidance activities are widely practised among listed companies as they try to reduce their tax burdens.

While reducing taxes clearly benefits companies that adopt tax avoidance strategies, this type of tax reporting activity significantly reduces government tax revenues, which potentially prevents economic prosperity and cuts down public welfare (Biswas, Chakraborty and Hai 2017). The tax avoidance literature identifies various determinants and consequences of aggressive tax practices; these include the cost of equity and debt, financial reporting quality, stockholder activism, internal control weakness, executive compensation, and stock liquidity and crash risk (Badertscher, Katz and Rego 2013; Bauer 2016; Chen et al. 2019; Gaertner 2014; Graham et al. 2014; Huseynov and Klamm 2012; Frank, Lynch and Rego 2009; Goh et al. 2016; Hasan et al. 2014; Kim, Li and Zhang 2011; Rego and Wilson 2012). Dyreng, Hanlon and Maydew (2010) suggest that corporate executives, such as CEOs and CFOs, influence corporate tax practices. We argue that insuring D&O against allegations of "misbehaviours" alters executives risk tolerance and motivates aggressive risk-taking behaviours (Boyer and Tennyson 2015; Kalelkar and Nwaeze 2015).

By analyzing samples of Canadian listed companies from S&P/TSX Composite Index during 2002 to 2018, the results indicate that adopting D&O insurance policy has a positive relation with tax avoidance practices captured by effective tax rate. This finding satisfies our prediction that managers could generate an unexpected moral hazard problem and make aggressive risk-taking behaviours if they purchase D&O liability insurance coverage. Furthermore, additional test findings suggest that such association is only significant during non-crisis periods. It can be interpreted that, during crisis periods, companies face high pressure of survival, and thus executives are highly motivated to adopt aggressive tax strategies no matter how the insurance policy is executed.

Additionally, this paper explores the moderating roles of profitability and financial distress on the main effect of D&O coverage on aggressive tax behaviours. We find that the association is weakened in better performing firms and those with lower default risk.

Such empirical evidence proves the argument that firms with relatively poor performance or higher default risk are motivated to adopt aggressive tax practice (Bauer 2016; Chen et al. 2019). Heckman two-stage method is adopted, controlling for potential selection bias of purchasing the D&O liability insurance coverage. Besides, additional analyses confirm the robustness of empirical results by adding an instrumental variable, concerning potential endogeneity issues.

The research contributes to the existing literature as follows. At first, according to the agency theory, executives probably do not serve the most interests of investors considering their personal inconsistent interest (Jensen and Meckling 1976). This study enhances our understanding of agency theory by documenting that insuring D&O "misbehaviours" can lead to inappropriate managerial risk-taking behaviours, since purchasing liability insurance reduces D&O's accountability and increases the potential of a moral hazard problem. Second, it extends the D&O liability insurance and corporate tax practice literature through examining the relationship between this insurance and corporate tax reporting activities (Gaertner 2014; Lin et al. 2013; Zeng 2017). In particular, we find that this association is conditional on several factors such as financial crises, profitability, and financial distress. Although Zeng (2017) has investigated how purchasing D&O liability insurance affects the companies' tax reporting practices, this paper is among the first to explore the conditions under which insuring D&O against allegations of "misbehaviours" could have a differential impact on corporate tax reporting strategies.[2] Third, our study conduces to financial crisis literature as it proves that managerial behaviours can be driven by a financial crisis, during which firms face economic uncertainty and financial challenges. Specifically, we find that during financial crisis periods, managers are motivated to adopt aggressive tax strategies (captured as D&O liability insurance coverage) disregarding their incentives for risk-taking behaviours. The result shows consistency with the evidence that firms prefer to use aggressive decision-making strategies during financial crisis periods (Guo, Jalal, and Khaksari 2015; Palvia, Vahamaa, and Vahamaa 2015; Richard, Taylor, and Lanis 2015).

The rest of the paper is arranged as follows. First, relevant literature is reviewed so

[2] In contrast to Zeng (2017), we use a refined measure, excess coverage, to capture insurance more precisely (Core 1997; 2000; Lin et al. 2013).

that we could propose significant research questions. Next, we describe our methodology, data collection methods, measurement of key variables, and regression models we used. We then present our empirical results and discuss their significance. Finally, we conclude the study with summary of the findings and discussion of practical implications.

2. Literature Reviews and Research Questions

As rational economic agents, directors and officers are considered risk-averse since their reputation, human capital, and personal wealth are strongly associated with the company they work for (Amihud and Lev 1981; Smith and Stulz 1985). They are even more risk-averse because they have to bear legal liabilities to related parties and stakeholders (e.g., investors, creditors, environmentalists, tax authorities). Since their managerial decisions may lead to unfavourable consequences (Core 1997). In general, corporate D&O could be litigated either for violation of fiduciary responsibilities under corporate regulations or other securities laws (Donley and Kent, 2008; Pritchard and Sarra 2010).

In practice, D&O liability insurance coverage, which is also named as D&O liability insurance policy, is purchased by most public firms, with compensation clauses attached to recruit and retain high quality managerial talent, and to protect D&O from personal liability that might result from their business decisions (Donley and Kent, 2008). A survey by *Boardroom Briefing* found that 87% of the participating corporate directors were reluctant to take office unless a detailed D&O coverage policy is well-prepared, in spite of the allowable company indemnification. According to Allianz (2020), D&O liability insurance is considered as claim-based insurance, which is made up of personal coverage (Side A) and corporate insurance (Side B and C). Side A pays indemnification to managers themselves in circumstances where the company is unable to indemnify them (normally because of financial reasons or legal restrictions). Side B coverage covers corporate assets and reimburses public and private companies for defence costs and indemnification on behalf of directors and officers. Side C is purely a corporation insurance which covers corporation itself for security claims only. In general, D&O liability insurance protects managers against allegations of "misbehaviours."[3] Therefore, companies frequently include D&O insurance policy as a necessary component of their

[3] The typical D&O liability insurance policy covers damages, judgments, litigation, and settlements expenses.

risk control systems.

Because D&O know that they are sheltered by the insurance policy, they are likely to make more aggressive business decisions. We presume that D&O liability insurance promotes corporate risk-taking behaviours via three important channels. First, the disciplining effect of investors will be reduced as the insurance decreases managers' personal legal liabilities. As the insurance policy restricts managers' responsibilities that considerable losses caused by business decisions may therefore be covered up, D&O are highly encouraged to invest in risky projects (Baker and Griffith 2010; Lin et al. 2013). Second, it is documented that D&O liability insurance coverage motivates aggressive reporting and discourages voluntary disclosure, which reduces financial reporting quality and transparency (Chung and Wynn 2008; Wynn 2008). Third, the protecting role of DO insurance limits financial reporting quality and transparency and increases information asymmetry, which is expected to generate unintended moral hazard problems.

Consistent with the above-mentioned arguments of increased corporate risk-taking behaviours, the existing empirical evidence suggests various negative consequences of purchasing the insurance for managers (Chen, Li and Zou 2016; Chung, Hillegeist, and Wynn 2015; Chung and Wynn 2008; Kalelkar and Nwaeze 2015; Lin et al. 2011, 2013; Wynn 2008; Yuan, Sun and Cao 2016; Zeng 2017). Chen, Li and Zou (2016) think a larger amount of D&O liability insurance coverage implies higher cost of equity. This result approves the argument that the insurance could mitigate the monitoring function of investors lawsuits on managers. Lin et al. (2011) document that for merger and acquisition acquirers, the D&O insurance coverage is negatively related to abnormal stock return during the announcement-period. Lin et al. (2013) propose that D&O liability insurance are considered, in investors' eyes, as a rising credit risk and that the purchase of this insurance is closely related with higher bank loan spreads. Similarly, Chung, Hillegeist, and Wynn (2015) find that auditors charge higher auditing fees for firms with higher D&O liability insurance coverage. It is also argued that this insurance motivates managers' risk-taking behaviours and is positively related with stock crash risk (Yuan, Sun and Cao 2016). Consistent with the argument of a disciplining effect, Kalelkar and Nwaeze (2015) and Zeng (2017) document that insuring D&O against allegations of "misbehaviours" results in aggressive corporate investment and tax strategies. Overall, these studies suggest that D&O

liability insurance coverage encourages managerial aggressive decisions, increases information asymmetry, and creates an unintended moral hazard problem, which can result in negative economic consequences.

First research question. Our first research question investigates the association between D&O liability insurance coverage and tax avoidance behaviours, which can be broadly defined as any tax-related activities that consistently reduce a company's effective tax rate (Dyreng, Hanlon and Maydew 2008, 2010). One view of tax avoidance is corporate value maximizing strategies that retain more wealth in the firm instead of transferring it from the firm to the government. While tax avoidance strategies benefit firms, this type of aggressive tax reporting considerably reduces government tax revenues and thus indirectly impedes domestic economic development and public welfare (Biswas, Chakraborty and Hai 2017). According to 2018 Canada Revenue Agency report, the Federal Government of Canada is losing approximately $22 billion dollars every year to corporate tax dodgers. Goh et al. (2016) find that shareholders do not ask for a higher return rate for companies with larger amount of tax avoidance due to the positive cash flow effects. However, Goh et al. (2016) ignores the potential negative impact of tax avoidance and fails to consider other stakeholders' reactions to corporate tax avoidance.

The majority of the tax avoidance-related studies suggest that aggressive tax reporting activities are positively associated with various information risks (Bonsall, Koharki, and Waston 2017; Desai and Dharmapala 2006; Hanlon 2005; Hasan et al. 2014; Hope, Ma and Tomas 2013; Kim, Li and Zhang 2011). Bonsall, Koharki, and Waston (2017) report that a higher level of tax avoidance behaviour is related with more frequent and pronounced credit rating agency disagreements. Tax avoidance increases information asymmetry because tax avoidance activities are intricate and underground as they are conducted to dodge the detection of revenue agencies (Desai and Dharmapala 2006). Hanlon (2005) shows that corporations with more tax avoidance activities display less earnings persistence. The aggressive tax practices are also considered as huge risks by banks so that companies with greater tax avoidance incur more stringent non-pricing loan terms and higher loan spread at issuance (Hasan et al. 2014).

Hope, Ma and Tomas (2013) propose that companies conducting tax avoidance activities may discontinue disclosure of geographic earnings, and impedes information

sharing and transparency. Kim, Li and Zhang (2011) find that tax avoidance activities are positively associated with crash risk, thus predicting executive rents and bad-news are more likely to be exacted and withheld due to tax avoidance activities. Combined with the above-discussed unintended moral hazard problem stemmed from D&O insurance policy, it is predicted that protected executives have the incentive to adopt aggressive strategies such as tax avoidance. This occurs because D&O insurance coverage can significantly reduce financial damages and managers' personal liability to stakeholders. This prediction is consistent with Dyreng, Hanlon and Maydew (2010), who argue that executives such as CEOs and CFOs influence corporate tax practices, and with other evidence that managers with military experience are more risk-averse and tend to adopt less aggressive tax reporting strategies (Law and Mills 2017).

Second research question. Our second research question explores that under which condition does the main effect between D&O liability insurance coverage and corporate tax avoidance is evident. Two different moderators are taken into consideration: firm performance and financial distress. Previous studies have recognized the heterogeneity among firms with regard to their risk-taking behaviours (Chrisman, Chua and Kellermanns 2009; Chrisman and Patel 2012). Mahto and Khanin (2015) explore how firm performance affects a firm's goal setting and future performance expectations. Their results show that satisfaction with firm performance is associated with lower risk-taking behaviours. Healy et al. (2014) find that firms whose ROAs exceed expectations engage in lower levels of accrual earnings management. This is consistent with agency theory predictions that as corporates' ownership and execution rights are separated, inducing information asymmetry issues, a compensation mechanism is required to link managerial compensation with firm performance (Jensen and Meckling 1976). Both Tosi and Gomez-Mejia (1994), and Lobo, Neel and Rhodes (2018) find firm performance positively related with executive compensation. We predict that when a firm's performance is below what is expected, executives will face greater pressures from capital providers, and their compensation will be negatively affected. This motivates executives to adopt aggressive tax reporting practices to cover up the relatively poor performance.

Though financial distress may not cause such bad results as bankruptcy, it always brings about a great number of economic loss. In this situation, D&O may be blamed by

the public and have a consequent award deduction (Gilson 1989). Jensen and Meckling (1976) document that information asymmetry causes severe agency issues among executives, creditors and investors for corporates under financial distress. The existing studies prove that corporates under financial distress have an incentive to avoid financial risks by earnings management or predictive tools. For example, firms may reveal optimistic forward-looking information (Rogers and Stocken 2005), disclose good news in time (Charitou, Lambertides and Trigeorgis 2011), and overstate operating cash flow (Lee 2012). We argue that, to overcome financial difficulties, companies under financial distress intend to take tax avoidance activities to conserve cash.

3. Methodology

3.1 Sample

Because it is mandatory for publicly listed companies in Canada to disclose D&O liability insurance information, Canadian stock markets are reliable data sources for a natural experiment to answer the two research questions asked in this study (Chung and Wynn 2008; Wynn 2008; Lin et al. 2011; 2013; Chen, Li and Zou 2016; Zeng 2017).[4] D&O liability insurance of Canadian sample firms are manually collected from the publicly available database, System for Electronic Document Analysis and Retrieval (SEDAR). To calculate corporate tax avoidance and control variables, the data were extracted from COMPUSTAT North America. The Canadian Financial Markets Research Centre (CFMRC) provides information for calculating firm stock return.

The initial sample included 10,897 firm-year observations from 641 Canadian companies in the S&P/TSX Composite Index during 2002 to 2018.[5] We first eliminated 4,222 firm-year observations with firms that did not disclose a proxy circular. Next, we dropped 3,234 firm-year observations for companies not adopting D&O insurance policies. Finally, we deleted 3,441 firm-year observations with missing information that is needed to calculate tax avoidance and control variables. Our final sample contains 1,860 firm-year

[4] D&O liability insurance coverage is not required to disclose for U.S. listed companies. In comparison, Canadian publicly listed firms are mandatorily required to disclose their D&O liability information, thus more preferrable for researchers.

[5] The S&P/TSX Composite Index replaced TSE 300 since May 2002 and became the standard Canadian Index till now. It represents nearly 70% of the entire market capitalization on TSX, with 250-300 firms involved, though the index list varies by year. During the sample period 2002-2018, 641 firms are included in the S&P/TSX Composite Index.

observations for regression analysis (Table 1 is enclosed as a detailed sample selection process).

[Insert Table 1 about here]

3.2 Models and Variables

Consistent with prior research (Bauer 2016; Chen et al. 2019; Cheng et al. 2012; Gaertner 2014; Huseynov and Klamm 2012; Law and Mills 2017; Rego and Wilson 2012), we use the following regression models to examine our research questions. The main effect of D&O liability insurance on tax avoidance is tested using equation (1), and the moderating roles of firm performance and financial distress in financial crisis sub-samples are tested using equation (2). As there may be biased standard errors in OLS regressions of panel data because of residual correlations, the standard errors of coefficients for firm-level clustering and heteroscedasticity are corrected (Petersen 2009).

$$\boldsymbol{ETR}_{t+1} = \beta_0 + \beta_1\boldsymbol{ExCOVER}_t + \beta_2 Size_t + \beta_3 Leverage_t + \beta_4 ROA_t + \beta_5 NOL_t + \beta_6 ForeignTax_t + \beta_7 CapitalInt_t + \beta_8 CashHold_t + \beta_9 StockReturn_t + \beta_{10} Growth_t + \beta_{11} Big4_t + \beta_{12} CrossList_t + \beta_{13} Dividend_t + Industry\ Dummies + Year\ Dummies \quad (1)$$

$$\boldsymbol{ETR}_{t+1} = \beta_0 + \beta_1\boldsymbol{ExCOVER}_t + \beta_2\boldsymbol{Moderator}_t + \beta_3\boldsymbol{ExCOVER}\times\boldsymbol{Moderator}_t + \beta_4 Size_t + \beta_5 Leverage_t + \beta_6 ROA_t + \beta_7 NOL_t + \beta_8 ForeignTax_t + \beta_9 CapitalInt_t + \beta_{10} CashHold_t + \beta_{11} StockReturn_t + \beta_{12} Growth_t + \beta_{13} Big4_t + \beta_{14} CrossList_t + \beta_{15} Dividend_t + Industry\ Dummies + Year\ Dummies \quad (2)$$

Dependent variable: Following previous studies, the effective tax rate (*ETR*) is used as a proxy for tax avoidance (Bonsall, Koharki, and Waston 2017; Chen et al. 2019; Gaertner 2014; Hasan et al. 2014; Huseynov and Klamm 2012). *ETR* is measured as tax expenses (COMPUSTAT TXT) over pre-tax income (COMPUSTAT PI).

Independent variable: As a refined measure to calculate D&O's liability insurance coverage, excess D&O's liability insurance coverage (*ExCOVER*) is used as the proxy for *D&O Insurance,* and has been widely mentioned in previous studies (Chung, Hillegeist, and Wynn 2015; Core 1997; 2000; Gillan and Panasian 2015; Kalelkar and Nwaeze 2015;

Lin et al. 2013; Wynn 2008). Specifically, *ExCOVER* is calculated as the residuals of the following equation (3).[6]

$$COVER_{t+1} = \beta_0 + \beta_1 Size_t + \beta_2 Leverage_t + \beta_3 ROA_t + \beta_4 Growth_t + \beta_5 StockReturn_t + \beta_6 CashHold_t + \beta_7 CrossList_t + \beta_8 Technology_t + \beta_9 Regulated_t + \beta_{10} Litigation_t + \beta_{11} Big4_t + \beta_{12} Environmental_t + Industry\ Dummies + Year\ Dummies \quad (3)$$

COVER is the D&O liability insurance coverage limit divided by the market value of equity. *Size* is the natural log of total assets (COMPUSTAT AT). *Leverage* is measured as total liabilities (COMPUSTAT LT) scaled by total assets. *ROA* is measured as net income (COMPUSTAT NI) over lagged total assets. *Growth* refers to growth opportunity and is calculated as the sum of market value of equity and book value of total liabilities, scaled by total assets. *StockReturn* denotes the standard deviation of monthly stock return for the previous year. *CashHold* is measured as cash and short-term investments (COMPUSTAT CHE) divided by lagged total assets. *CrossList* is a dummy variable equalling one if the Canadian publicly listed company is cross-listed in the U.S., and zero otherwise. *Big4* indicates whether this firm invites a big-4 auditor to audit its financial statements.

We also include several industry indicators to control for the variation of litigation risk across industries (Aerts, Cormier and Magnan 2006; Cho and Patten 2007; Core 1997). *Technology* is an indicator which equals one if the company is in the technology sector, and zero otherwise. *Regulated* is an indicator which equals one if the firm operates in a regulated industry, and zero otherwise. *Litigation* is an indicator which equals one if the firm is a member of the industry with high litigation risks, and zero otherwise. *Environmental* is an indicator which equals one if the company is a member of the environmentally sensitive industry, and zero otherwise. A summary definition of variables mentioned above is enclosed in the Appendix.

Moderators: We use two different moderators to explore the effect of D&O liability insurance coverage on tax avoidance: (1) *ROA* captures firm performance and is measured as industry mean-adjusted ROA (Lobo, Neel and Rhodes 2018). ROA is measured as net income (COMPUSTAT NI) over lagged total assets. (2) We use *Z-Score* as a proxy for financial distress. It is calculated based on following equation (4) (Altman 1968; 1993).

[6] The residual coverage amount is estimated following Core's (1997) insurance model, in which the dependent variable is the logged D&O insurance coverage,and the determinants include logged market value of equity, ROA, leverage, cash holdings, cross listing, governance quality, and industry and year indicators.

$Z\text{-}Score$ = 1.2×WCAP/AT+1.4×RE/AT+3.3×EBIT/AT+0.6×MVE/LT+SALE/AT (4)

WCAP is working capital (COMPUSTAT WCAP). AT is total assets. RE is retained earnings (COMPUSTAT RE). EBIT refers to earnings before interest and taxes (COMPUSTAT EBIT). MVE stands for market value of equity. LT refers to total liability and SALE is net sales (COMPUSTAT SALE).

Control variables: Following previous studies, a group of control variables are included in the empirical models (Bauer 2016; Chen et al. 2019; Cheng et al. 2012; Gaertner 2014; Huseynov and Klamm 2012; Rego and Wilson 2012; Barnea and Rubin 2010; Law and Mills 2017). Control variables that have been discussed under equation (3) are not repeated here. NOL stands for net operating loss. It is an indicator variable which equals one if tax loss carry forward (COMPUSTAT TLCF) exceeds 0, and zero otherwise. *ForeignTax* is an indicator equalling one if the firm has positive foreign income tax, and zero otherwise. *CapitalInt* captures capital intensity and is calculated as capital expenditures (COMPUSTAT CAPX) divided by lagged total assets. *Dividend* is a dummy variable which equals one if a company declares dividends (COMPUSTAT DVC), and zero otherwise.

Control for Self-Selection: Our hypotheses focus on firms adopting D&O insurance policies. However, it is possible that whether the firm follows such D&O policy or not could directly reflects firms' different tax reporting strategies. To address the selection bias problem regarding the purchase choice of D&O's liability insurance coverage, we apply the Heckman two-stage linear squares regressions (Chung and Wynn 2008; Chung, Hillegeist, and Wynn 2015; Heckman 1979; Gillan and Panasian 2015; Yuan, Sun and Cao 2016). In the first stage, a probit model is operated (see equation 5 below), where the dependent variable, *PurchaseD*, is a dummy variable equalling one if the firm purchases D&O insurance for its executives, and zero otherwise. Independent variables are a set of factors that determine the purchasing decision.

$$PurchaseD_{t+1} = \beta_0 + \beta_1 Size_t + \beta_2 Leverage_t + \beta_3 ROA_t + \beta_4 Growth_t + \beta_5 CashHold_t + \beta_6 CrossList_t + \beta_7 Technology_t + \beta_8 Regulated_t + \beta_9 Litigation_t + \beta_{10} Big4_t + \beta_{11} Environmental_t + Industry\ Dummies + Year\ Dummies \quad (5)$$

In the second stage, we include the inverse Mills ratio (*IMR*), which is calculated from the first stage in equations (1) and (2) to test our hypotheses.

4. Empirical Results

4.1 Descriptive Statistics and Correlations

Table 2 illustrates the descriptive statistics of both full sample and sub-samples categorized by crisis period (2007-2010) and non-crisis periods (2002-2006 and 2011-2018). The average amount of *PurchaseD* in the full sample is 0.594, indicating that 59.4% of firm-year observations purchased D&O liability insurance. It also shows that the average effective tax rate (*ETR*) in the full sample is 17.8%. Compare mean t-test suggests that there are significantly more firms that purchased D&O's liability insurance during the financial crisis period, and that the insurance coverage (*COVER*) was significantly higher during the crisis period. It indicates that the uncertainty during the financial crisis increases the demand for insuring managers' "misbehaviours" and the limit of the insurance coverage. The sub-sample comparison also indicates that the effective tax rate was significantly lower during the financial crisis period, which means that firms were likely to adopt more aggressive tax reporting strategies during the crisis period instead of non-crisis periods. The possibility of hiring auditors from Big 4 accountancy firms declined slightly, and firms had higher stock returns in the crisis period. In addition, a control variables' mean comparison t-test shows that firms also differ significantly in capital intensity between crisis and non-crisis periods.

[Insert Tables 2 and 3 here]

Table 3 shows the Pearson's correlation matrix of variables that are included in the main regression. It shows that the effective tax rate (ETR) is significantly and negatively correlated with excess insurance coverage (*ExCOVER*), which suggests that firms that purchase excess liability insurance for their D&O have a lower effective tax rate. This is consistent with our expectation that purchasing such liability insurance would motivate corporate risk-taking behaviours. In addition, the correlation matrix indicates that some control variables (e.g., *Size, Leverage, CashHold, StockReturn, Growth, Big4*, and *Dividend*) are significantly correlated with the dependent variable (ETR).

4.2 Main Results

Table 4 presents the results from the first state of the Heckman two-stage process, as well as the results from the excess coverage regression. Following Petersen (2009), the standard errors of the OLS regression coefficients for firm-level clustering and

heteroscedasticity are corrected. The first column (DV: *PurchaseD*) summarizes the probit results based on equation (5). The results indicate that it is more possible for firms with larger size, more cash holdings, audited by big4 auditors, and operating in an environmental industry to engage in the liability insurance policy. By contrast, companies that operate in a regulated industry and have lower growth opportunities are less likely to purchase the insurance. The second column (DV: *Coverage*) summarizes the results based on equation (3). They suggest that firms with a higher level of leverage, more cash holdings, cross-listed in the U.S. market, and audited by big4 auditors tend to purchase a larger amount of D&O's liability insurance coverage. By contrast, companies with larger size, better performance, and more growth opportunities tend to buy such insurance with lower coverage.

[Insert Tables 4 and 5 about here]

Results from the second state of the Heckman process that are based on Equations (1) and (2) are tabulated in Table 5. In the main effect column, the coefficient on excess coverage (*ExCOVER*) (-0.208) is negative and significant at 1% level, which indicates that firms with excess D&O liability insurance coverage have a lower effective tax rate (*ETR*), which is a proxy for tax avoidance. To investigate the economic relation between tax avoidance and D&O insurance policy, we calculate the economic significance[7] and find that the coefficient of excess coverage is also economically significant. The result suggests that a one standard deviation increase in excess coverage will result in a 10.02% decrease of the effective tax rate relative to its mean. This finding is consistent with our prediction that purchasing D&O liability insurance coverage generates unintended moral hazard problems due to the decreased discipline effect of shareholder litigation and the increased level of information asymmetry. It also echoes the results documented in previous studies that insuring D&O "misbehaviours" encourages corporate risk-taking activities (Lin et al. 2013; Kalelkar and Nwaeze 2015; Yuan, Sun and Cao 2016; Zeng 2017).

The moderator columns of Table 5 summarize the moderating effects of firm performance and financial distress, respectively, on the main effect of D&O liability insurance coverage on tax avoidance. The coefficient on the interaction term between ROA and excess coverage (*ROA*×*ExCOVER*) is positive and significant at the 1% level. It

[7]The economic significance is calculated as the coefficient of ExCov times its mean, divided by the mean of ETR.

suggests that firm profitability weakens the effect of purchasing D&O liability insurance coverage on motivating the aggressive tax practices. This finding is consistent with the evidence that firms with better performance are less likely to conduct risk-taking behaviours (Healy et al. 2014); Mahto and Khanin; 2015). In addition, the coefficient on the interaction term between financial distress and excess coverage (*Z-Score*×*ExCOVER*) is positive and significant at the 1% level as well, which indicates that the association between excess liability insurance coverage and tax avoidance is weakened for firms with lower level of default risk. The results echoes the evidence in the literature that financially distressed firms are likely to take aggressive actions to inflate earnings and cash flows (Charitou, Lambertides and Trigeorgis 2011; Lee 2012; Rogers and Stocken 2005).

The 2008 financial crisis significantly changed corporate risk-taking appetites; the financial crisis literature shows that firms are more likely to adopt aggressive decision-making strategies during periods of financial crisis (Guo, Jalal, and Khaksari 2015; Palvia, Vahamaa, and Vahamaa 2015; Richard, Taylor, and Lanis 2015). According to Ferrero-Ferrero, Fernandez-Izquierdo, and Munoz-Torres (2012), corporate governance mechanisms may fail to safeguard stakeholders' interests during a financial crisis. Geiger, Raghunandan, and Riccardi (2014) found that the likelihood of auditors issuing a going-concern modified opinion increased significantly after the start of a financial crisis.

To examine this issue, we created financial crisis sub-samples to re-test the above-discussed main and moderating effects. The sub-samples are categorized by the crisis period (2007-2010) and non-crisis periods (2002-2006 and 2011-2018) (Guo, Jalal, and Khaksari 2015; Palvia, Vahamaa, and Vahamaa 2015). Findings are tabulated in Table 6. The coefficient on excess coverage (*ExCOVER*) is only negative and significant in the non-crisis sub-sample. In addition, the coefficients on the interaction terms between ROA and excess coverage (*ROA*×*ExCOVER*), and that between financial distress and excess coverage (*Z-Score*×*ExCOVER*) are positive and significant only in the non-crisis sub-sample. These empirical results indicate that, during a financial crisis period, firms are likely to adopt aggressive tax reporting practice regardless of their performance and default risk, and level of D&O liability insurance coverage. Our interpretation of these findings is that corporate governance mechanisms may fail to protect stakeholders during the financial crisis period (Ferrero-Ferrero, Fernandez-Izquierdo, and Munoz-Torres 2012).

[Insert Table 6 about here]

To further clarify the above-discussed moderating effects of *ROA* and *Z-Score*, we illustrate the two-way moderating effect in Figures 1, 2, and 3. The interaction terms that test the moderating roles of *ROA* and *Z-Score* in the full sample are depicted in Figure 1. It shows that the negative association between D&O liability insurance coverage and tax avoidance is alleviated for those firms with high profitability and low default risk. The same moderating effects by crisis and non-crisis sub-samples are illustrated in Figures 2 and 3. They indicate that the effects of profitability and default risk in weakening the association between D&O liability insurance coverage and tax avoidance are significant during non-crisis periods.

[Insert Figures 1, 2, and 3 about here]

4.3 Additional Analysis and Robustness Tests

The association between D&O liability insurance coverage and tax avoidance could be spurious, since they might both be driven by omitted variables, such as a firm's fundamental risk (Kim, Li and Zhang 2011; Lin et al. 2013). Thus, firms with a higher level of fundamental risk might purchase D&O liability insurance with a higher coverage limit, and these firms tend to adopt more aggressive tax reporting strategies. We use the 2SLS instrumental variable approach to address the potential concern about this endogeneity issue. Following prior studies, we use industry average insurance coverage as an instrumental variable (Chung and Wynn 2008; Chung, Hillegeist, and Wynn 2015; Kalelkar and Nwaeze 2015; Lin et al. 2011; 2013). According to Core (1997; 2000), firms operating in the same industry face similar business risks. Adams, Lin, and Zou (2011) find that a firm's executive compensation package could be affected by the compensation packages provided by other firms in the same industry. Accordingly, we argue that industry average insurance coverage correlates with a firm's D&O liability insurance coverage, but it is unlikely to affect a firm's tax reporting practice. The first-stage results are reported in Table 7 under "1st Stage" column and the coefficient on our instrument variable (industry average insurance coverage) is positive and significant at the 1% level. The second-stage results are summarized in Table 7 under "2nd stage" columns. Overall, the above-documented main effect and moderating effects, including both full sample and sub-samples, remain unchanged, which indicates that our primary findings are robust with

respect to the potential endogeneity issue, and are controlled by adopting the 2SLS instrumental variable approach.

[Insert Table 7 about here]

The reported annual coverage limit on the proxy statement is based on the fiscal year of the D&O's liability insurance contracts. For some firm-year observations, the contract's fiscal year could be different from the firm's financial reporting fiscal year. We therefore manually converted the contract's fiscal year annual coverage limit to firm fiscal year annual coverage limit. Next, we re-estimated the residual of Equation (3) using the newly converted coverage limit as the dependent variable. As a robustness check, we re-ran the primary regression models for both full sample and sub-samples with this alternative measure of excess D&O liability insurance coverage. Results are summarized in Table 8. Overall, our primary findings are not influenced by the fact that, for some firms, the liability insurance contract's fiscal year is different from the firm's annual reporting fiscal year.

[Insert Tables 8 and 9about here]

We included the regulated industry dummy as a control variable when estimating the excess insurance coverage in Equation (3) and controlled industry fixed effect in all our regression models (Core 1997; Wynn 2008; Chung, Hillegeist, and Wynn 2015). However, one could argue that firms in regulated and financial service industries face different reporting requirements and business environments. To address this possibility, we deleted the regulated and financial firms, and re-ran the regressions for both main and moderating effects. As presented in Table 9, the results remain qualitatively unchanged.

Berle and Means (1932) discuss the agency issues caused by the separation of ownership and executive rights. It is discussed that executives have an incentive to seek their personal profits instead of the interests of external investors. Based on the previous theories (Berle and Means 1932; Coase 1937), another agency theory is proposed by Jensen and Meckling (1976) that, due to information asymmetry and a misalignment of interests, managers (agents) would not act in the best interests of shareholders (principals). The disciplining effect of potential stakeholder litigation could be an effective mechanism to control for opportunistic managerial behaviours (Baker and Griffith 2010; Gillan and Panasian 2015). This study explores a situation under which the disciplining effect of

stakeholder litigation was mitigated. Practically, many listed companies purchase D&O liability insurance to prevent those individuals from personal liability and financial losses that result from bad business decision-making. However, insuring D&O against allegations of "misbehaviours" is controversial as it reduces managers' accountability in their business decision-making and creates an unintended moral hazard problem. We find that firms with higher excess insurance coverage tend to adopt aggressive tax practice, which is consistent with the argument that D&O liability insurance coverage motivates managerial risk-taking behaviours (Boyer and Tennyson 2015; Kalelkar and Nwaeze 2015; Zeng 2017).

5. Conclusions

This study builds on the literature that examines the relation between D&O liability insurance coverage and corporate tax avoidance (Badertscher, Katz and Rego 2013; Bauer 2016; Chen et al. 2019; Chung, Hillegeist, and Wynn 2015; Gaertner 2014; Huseynov and Klamm 2012; Law and Mills 2017; Lin et al. 2011; 2013; Wynn 2008; Zeng 2017). We extend this literature by shedding light on the motivations for aggressive tax reporting strategies. Specifically, we argue that insuring D&O "misbehaviours" mitigates the monitoring function of stakeholder lawsuits and motivates aggressive corporate decision-making. Consistent with that expectation, we document that firms that purchased a larger amount of D&O insurance coverage have a higher degree of tax avoidance.

We also conduct a sub-sample analysis to determine if the main effect of D&O liability insurance on tax avoidance differs between financial crisis and non-crisis periods. Our empirical findings suggest that this association is only significant during non-crisis periods. However, during a financial crisis period, purchasing the insurance is not significantly relevant to decision-making with regard to corporate tax reporting strategies. The result shows consistency with the argument that corporate governance mechanisms fail to protect the interests of stakeholders during financial crisis periods, and that firms tend to adopt aggressive strategies and behaviours during such periods (Ferrero-Ferrero, Fernandez-Izquierdo, and Munoz-Torres 2012; Guo, Jalal, and Khaksari 2015; Palvia, Vahamaa, and Vahamaa 2015).

In addition, we investigate the conditions under which the association between D&O liability insurance coverage and aggressive tax reporting strategies may differ. As expected, we find that the effect of insuring D&O "misbehaviours" on encouraging tax

avoidance weakens for profitable firms and for firms with a lower default risk. These findings echo the evidence documented in the literature that poorly performing and financially distressed firms are motivated to engage in risk-taking behaviours (Charitou, Lambertides and Trigeorgis 2011; Healy et al. 2014; Lee 2012; Mahto and Khanin 2015; Rogers and Stocken 2005). Our primary findings are quantitatively unchanged in multiple sets of robustness checks, such as adopting the 2SLS instrumental variable approach to control for endogeneity and using alternative measure of excess insurance coverage.

Policymakers around the world have committed significant funding to deal with the phenomenon of corporate tax avoidance. For example, the Federal Government of Canada committed approximately $1 billion of budget funding in 2016 and 2017 to crack down on tax evasion and to combat tax avoidance at home and abroad. Effectively controlling corporate tax avoidance has become an incredibly significant economic issue because it also has social consequences. Thus, the results from this study have important practical implications for policymakers and tax-related practitioners. We previously noted that the Federal Government of Canada loses approximately $22 billion dollars every year to corporate tax dodgers. Our findings in this study will help the Canada Revenue Agency reduce the aggressive tax reporting practice by focusing their attention on firms with excessive D&O liability insurance coverage, since those firms have a stronger incentive to take risks. In addition, tax authorities should keep an eye on poorly performing firms and firms with higher levels of default risk because those companies tend to exhibit aggressive behaviours to avoid tax.

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Appendix Variable Definition

Variable	Definition	Source
PurchaseD	A dummy variable equalling one if the firm purchases D&O insurance for its executives, and zero otherwise	www.sedar.com
COVER	The D&O liability insurance coverage limit divided by the market value of equity.	www.sedar.com
ExCOVER	Excess coverage is calculated as the residuals of a regression model in which COVER is dependent variable and a set of determinants are independent variables. Refer to equation (3) for details.	www.sedar.com
ETR	Effective tax rate is measured as tax expenses (COMPUSTAT TXT) divided by pre-tax income (COMPUSTAT PI).	COMPUSTAT
Size	The natural log of total assets (COMPUSTAT AT).	COMPUSTAT
ROA	Net income (COMPUSTAT NI) scaled by lagged total assets.	COMPUSTAT
Leverage	Total liabilities (COMPUSTAT LT) divided by total assets.	COMPUSTAT
NOL	Net operating loss is an indicator variable which equals one if tax loss carry forward (COMPUSTAT TLCF) exceeds 0, and zero otherwise.	COMPUSTAT
ForeignTax	A dummy variable which equals one if the company has positive foreign income tax, and zero otherwise.	COMPUSTAT
CapitalInt	Capital intensity is calculated as capital expenditures (COMPUSTAT CAPX) scaled by lagged total assets.	COMPUSTAT
CashHold	Cash holding is measured as cash and short-term investments (COMPUSTAT CHE) over lagged total assets.	COMPUSTAT
StockReturn	The standard deviation of monthly stock return for the previous year.	CFMRC
Growth	Growth opportunity is calculated as the sum of market value of equity and book value of total liabilities, divided by total assets.	COMPUSTAT
Big4	An indicator which equals one if the firm invites a big-4 auditor to audit its financial statements, and zero otherwise.	COMPUSTAT
CrossList	An dummy variable equalling one if the Canadian publicly listed company is cross-listed in the U.S., and zero otherwise.	COMPUSTAT
Dividend	An indicator variable which equals one if a firm declares dividends (COMPUSTAT DVC), and zero otherwise.	COMPUSTAT
Environmental	An indicator which equals one if the firm operates in an environmentally-sensitive industry, and SIC is in the set of {[1300, 1399], [2600, 2699], [2800,	COMPUSTAT

	2899], [2900, 2999], [3300 , 3399], [1000, 1099], [4900, 4999]}, and zero otherwise.	
Litigation	An indicator which equals one if the firm operates in an industry with high litigation risk, where SIC are {[2832, 2837], [3569, 3578], [7369, 7375], [3599, 3675], [5199, 5962], [8730, 8735]}, and zero otherwise.	COMPUSTAT
Regulated	An indicator which equals one if the firm operates in a regulated industry, where SIC is in the set of {[4810, 4900), [4921, 4925], 4931, 4941, [6020, 6024], 6035, 6036, 6141, 6311, 6321, 6331}, and zero otherwise.	COMPUSTAT
Technology	An indicator which equals one if the company is in the technology sector, in which SIC belongs to [2833, 2836], [8731, 8734], [7371, 7379], [3570, 3577], and [3600, 3674], and zero otherwise.	COMPUSTAT
Z-Score	Altman Z-Score= 1.2×WCAP/AT + 1.4×RE/AT + 3.3×EBIT/AT + 0.6×MVE/LT + SALE/AT WCAP is working capital (COMPUSTAT WCAP). AT is total assets. RE refers to retained earnings (COMPUSTAT RE). EBIT is earnings before interest and taxes (COMPUSTAT EBIT). MVE stands for market value of equity. LT is total liability and SALE is net sales (COMPUSTAT SALE).	COMPUSTAT

List of Tables

Table 1 Sample Selection

Sample Selection Process	# Observations Removed	# Observations Remaining
Initial Sample (641 firms, 2002-2018)		10,897
Missing information of insurance coverage	4,222	6,675
Missing information of control variables for Heckman	944	5,731
Missing information of firms which did not purchase insurance	3,234	2,497
Missing information of stock return measure	420	2,077
Missing information of tax avoidance measure	197	1,880
Missing information of control variables for primary regression	20	1,860
Sample used for main regression		1,860

Table 2 Descriptive Statistics

	Full sample						Crisis Period [2007, 2010]						Non-Crisis Period [2002, 2006], [2011, 2018]						Compare Mean t-Test
	N	St.Dev	Mean	Median	p25	p75	N	St.Dev	Mean	Median	p25	p75	N	St.Dev	Mean	Median	p25	p75	
PurchaseD	5731	.491	.594	1	0	1	1313	.489	.607	1	0	1	4418	.493	.582	1	0	1	-0.052***
COVER	2077	.129	.076	.03	.013	.076	510	.158	.095	.03	.012	.086	1567	.118	.07	.029	.013	.072	-0.025***
ETR	1860	.318	.178	.211	.007	.296	483	.351	.142	.199	0	.287	1377	.305	.19	.215	.029	.301	0.048***
ExCOVER	1860	.081	-.002	-.008	-.046	.024	483	.096	-.003	-.016	-.062	.018	1377	.076	-.001	-.005	-.039	.026	0.002
Size	1860	2.028	7.745	7.645	6.428	8.967	483	2.008	7.679	7.569	6.285	8.96	1377	2.035	7.768	7.701	6.45	8.974	0.089
ROA	1860	.252	-.003	.026	-.003	.06	483	.179	.012	.026	-.001	.067	1377	.273	-.008	.026	-.003	.059	-0.021
Leverage	1860	.246	.526	.542	.345	.684	483	.255	.522	.544	.301	.693	1377	.242	.528	.541	.354	.68	0.007
NOL	1860	.381	.824	1	1	1	483	.385	.82	1	1	1	1377	.379	.826	1	1	1	0.006
ForeignTax	1860	.404	.795	1	1	1	483	.411	.785	1	1	1	1377	.401	.799	1	1	1	0.014
CapitalInt	1860	.068	.058	.036	.006	.081	483	.073	.063	.037	.007	.087	1377	.067	.056	.035	.006	.08	-0.007*
CashHold	1860	.169	.134	.066	.023	.172	483	.157	.134	.077	.023	.184	1377	.173	.134	.061	.022	.17	-0.000
StockReturn	1860	.022	.035	.029	.019	.044	483	.025	.043	.036	.024	.056	1377	.02	.032	.027	.018	.041	-0.011***
Growth	1860	1.011	1.601	1.235	1.025	1.75	483	1.037	1.622	1.251	1.023	1.752	1377	1.003	1.594	1.23	1.025	1.749	-0.028
Big4	1860	.251	.932	1	1	1	483	.357	.851	1	1	1	1377	.194	.961	1	1	1	0.110***
CrossList	1860	.465	.315	0	0	1	483	.466	.317	0	0	1	1377	.464	.314	0	0	1	-0.002
Dividend	1860	.479	.644	1	0	1	483	.487	.615	1	0	1	1377	.476	.654	1	0	1	0.039
IMR	1860	.279	.482	.475	.267	.649	483	.269	.455	.435	.255	.613	1377	.282	.492	.488	.274	.671	0.037**

This table reports descriptive statistics of the full sample, as well as those of sub-samples categorized by the crisis period (2007-2010) and non-crisis periods (2002-2006 and 2011-2018). *PurchaseD* equals one if the firm purchases the insurance for its D&O, and zero otherwise. *COVER* is D&O liability insurance coverage limit scaled by the market value of equity. *ETR* is tax expenses divided by pre-tax income. *ExCOVER* is the residual in equation (3). *Size* is the natural log of total assets. *ROA* is net income scaled by lagged total assets. *Leverage* is total liabilities divided by total assets. *NOL* is net operating loss, an indicator which equals one if tax loss carry forward is larger than 0, and zero otherwise. *ForeignTax* equals one if foreign income tax is larger than 0, and zero otherwise. *CapitalInt* is capital intensity, an indicator which equals one if foreign income tax is larger than 0, and zero otherwise. *CashHold* is cash and short-term investments over lagged total assets. *StockReturn* is the standard deviation of monthly stock return for the previous year. *Growth* is the sum of market value of equity and book value of total liabilities, divided by total assets. *Big 4* equals one if the firm's financial statements are audited by a big-4 auditor, and zero otherwise. *CrossList* equals one if the Canadian public firm is cross-listed in the U.S., and zero otherwise. *Dividend* equals one if a firm declares dividends, and zero otherwise. *IMR* is the inverse Mills ratio calculated from equation (1) and (2). *, **, and *** represents significance at 10%, 5%, and 1% levels, respectively.

Table 3 Correlation Matrix

Variables	ETR	ExCOV	Size	ROA	Leverage	NOL	ForeignTax	CapInt	CashHold	StockReturn	Growth	Big4	CrossList	Dividend
ETR	1.000													
ExCOV	-0.051**	1.000												
Size	0.095***	-0.027	1.000											
ROA	0.108***	-0.173***	0.128***	1.000										
Leverage	0.084***	0.039*	0.481***	-0.191***	1.000									
NOL	-0.039*	-0.003	-0.115***	-0.095***	-0.164***	1.000								
ForeignTax	-0.004	0.016	-0.301***	-0.061***	-0.090***	-0.122***	1.000							
CapInt	-0.004	-0.100***	-0.098***	0.094***	-0.298***	0.097***	-0.004	1.000						
CashHold	-0.109***	0.031	-0.521***	-0.171***	-0.307***	0.128***	0.097***	-0.075***	1.000					
StockReturn	-0.120***	-0.012	-0.420***	-0.175***	-0.274***	0.215***	0.041*	0.150***	0.355***	1.000				
Growth	-0.052**	0.027	-0.390***	0.019	-0.258***	0.064***	0.035	0.206***	0.469***	0.127***	1.000			
Big4	0.084***	0.020	0.068***	-0.001	0.114***	-0.102***	0.054**	-0.104***	-0.040*	-0.143***	-0.067***	1.000		
CrossList	0.008	0.022	0.543***	0.063***	0.141***	0.103***	-0.447***	0.072***	-0.155***	-0.134***	-0.023	-0.061***	1.000	
Dividend	0.112***	-0.023	0.568***	0.178***	0.362***	-0.241***	-0.061***	-0.151***	-0.367***	-0.512***	-0.220***	0.121***	0.210***	1.000

This table illustrates the Pearson's correlation matrix of variables in the main regression. PurchaseD equals one if the company purchases liability insurance for its managers, and zero otherwise. COVER is D&O liability insurance coverage limit scaled by the market value of equity. ETR is tax expenses divided by pre-tax income. ExCOVER is the residual in equation (3). Size is the natural log of total assets. ROA is net income scaled by lagged total assets. Leverage is total liabilities divided by total assets. NOL is net operating loss, an indicator which equals one if tax loss carry forward is larger than 0, and zero otherwise. ForeignTax equals one if foreign income tax is larger than 0, and zero otherwise. CapitalInt is capital intensity, an indicator which equals one if foreign income tax is larger than 0, and zero otherwise. CashHold is cash and short-term investments over lagged total assets. StockReturn is the standard deviation of monthly stock return for the previous year. Growth is the sum of market value of equity and book value of total liabilities, divided by total assets. Big 4 equals one if the firm's financial statements are audited by a big-4 auditor, and zero otherwise. CrossList equals one if the Canadian public firm is cross-listed in the U.S., and zero otherwise. Dividend equals one if a firm declares dividends, and zero otherwise.

*, **, and *** represents significance at 10%, 5%, and 1% levels, respectively.

Table 4 Heckman Test and Excess Coverage Regression Results

Independent Variables	DV: PurchaseD		DV: COVER	
	Coefficient	t-value	Coefficient	t-value
Size	0.147***	6.86	-0.035***	-9.99
ROA	0.215	1.27	-0.146***	-4.12
Leverage	0.242**	2.13	0.065***	3.04
Growth	-0.039*	-1.82	-0.022***	-5.45
CashHold	0.528***	2.92	1.057***	4.54
CrossList	0.097*	1.70	0.063***	2.75
Technology	-0.108	-0.66	0.016*	1.80
Regulated	-0.619***	-3.41	-0.064***	-3.52
Litigation	0.072	0.45	0.058***	4.94
Big4	0.184**	2.40	0.046**	2.27
Environmental	0.281*	1.83	0.006	0.51
Constant	-1.119***	-4.91	0.007	0.59
Industry Fixed Effect	Yes		Yes	
Year Fixed Effect	Yes		Yes	
Observations	5731		2077	
(Pseudo) R-squared	0.190		0.443	
Chi-square	2716.589		/	

This table reports results from the first state of the Heckman process, and from the excess coverage regression. The first stage regression is a probit regression, which regresses PurchaseD on a set of purchase determinants. PurchaseD equals one if the company purchases liability insurance for its managers, and zero otherwise. COVER is D&O liability insurance coverage limit scaled by the market value of equity. Size is the natural log of total assets. ROA is net income scaled by lagged total assets. Leverage is total liabilities divided by total assets. Growth is the sum of market value of equity and book value of total liabilities, divided by total assets. CashHold is cash and short-term investments over lagged total assets. CrossList equals one if the Canadian public firm is cross-listed in the U.S., and zero otherwise. Big 4 equals one if the firm's financial statements are audited by a big-4 auditor, and zero otherwise. Technology equals to one if the firm is a member of a high-tech industry. Regulated equals to one if the firm is a member of a regulated industry. Litigation equals to one if the firm operates in an industry with high litigation risk. Environmental equals to one if the firm operates in an environmentally-sensitive industry.

*, **, and *** represents significance at 10%, 5%, and 1% levels, respectively.

Table 5 Main Effect and Moderating Effects in Full Sample

DV: Effective Tax Rate						
	Main Effect		Moderator: ROA		Moderator: Z-Score	
	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
ExCOVER	-0.208***	-2.65	-0.228***	-2.93	-0.189**	-2.11
ROA	-0.001	-0.80	-0.001	-1.07	-0.001	-0.71
ROA*ExCOVER			0.012***	2.73		
Z-Score					-0.001	-1.53
Z-Score*ExCOVER					0.008***	3.19
Size	0.004	0.40	0.003	0.38	0.010	0.86
Leverage	0.007	0.11	0.011	0.18	-0.005	-0.08
NOL	-0.025	-1.12	-0.024	-1.08	-0.048	-1.58
ForeignTax	0.016	0.70	0.016	0.68	0.017	0.61
CapitalInt	-0.140	-0.77	-0.151	-0.83	-0.134	-0.73
CashHold	-0.072	-1.01	-0.062	-0.88	-0.036	-0.46
StockReturn	-0.466	-0.92	-0.481	-0.94	-0.394	-0.75
Growth	0.014	1.53	0.014	1.50	0.017*	1.71
Big4	0.069	1.57	0.071	1.63	0.091*	1.96
CrossList	-0.018	-0.79	-0.017	-0.77	-0.014	-0.54
Dividend	0.036	1.33	0.037	1.34	0.037	1.29
IMR	-0.029	-0.29	-0.028	-0.28	0.025	0.22
Constant	0.090	0.72	0.088	0.70	-0.014	-0.09
Industry FE	Yes		Yes		Yes	
Year FE	Yes		Yes		Yes	
Observations	1860		1860			1,556
R-squared	0.080		0.083		0.086	0.086
Prob > F	0.000		0.000		0.000	0.000

This table reports results from the second state of the Heckman process. ETR are regressed on ExCOVER, moderators, and control variables. ETR is tax expenses divided by pre-tax income. ExCOVER is the residual in equation (3). ROA is net income scaled by lagged total assets. Z-Score is Altman Z-Score. Size is the natural log of total assets. Leverage is total liabilities divided by total assets. NOL is net operating loss, an indicator which equals one if tax loss carry forward is larger than 0, and zero otherwise. ForeignTax equals one if foreign income tax is larger than 0, and zero otherwise. CapitalInt is capital intensity, an indicator which equals one if foreign income tax is larger than 0, and zero otherwise. CashHold is cash and short-term investments over lagged total assets. StockReturn is the standard deviation of monthly stock return for the previous year. Growth is the sum of market value of equity and book value of total liabilities, divided by total assets. Big 4 equals one if the firm's financial statements are audited by a big-4 auditor, and zero otherwise. CrossList equals one if the Canadian public firm is cross-listed in the U.S., and zero otherwise. Dividend equals one if a firm declares dividends, and zero otherwise.

*, **, and *** represents significance at 10%, 5%, and 1% levels, respectively.

Table 6 Main Effect and Moderating Effects with Sub-sample Analysis

	DV: Effective Tax Rate											
	Main Effect				Moderator: ROA				Moderator: Z-Score			
	Crisis Period		Non-crisis Period		Crisis Period		Non-crisis Period		Crisis Period		Non-crisis Period	
	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
ExCOVER	0.102	0.58	-0.281***	-3.09	0.068	0.43	-0.290***	-3.16	0.082	0.42	-0.224*	-1.96
ROA	-0.001	-1.11	-0.000	-0.13	-0.002	-1.40	-0.000	-0.14	-0.001	-0.86	-0.000	-0.08
ROA*ExCOVER					0.013	1.14	0.014***	2.99				
Z-Score									-0.001	-0.42	-0.001	-1.01
Z-Score*ExCOV									0.003	0.49	0.009***	2.73
Size	0.006	0.34	-0.001	-0.13	0.005	0.30	-0.002	-0.14	0.009	0.37	0.003	0.26
Leverage	0.023	0.12	0.039	0.68	0.025	0.13	0.041	0.71	0.041	0.16	0.021	0.33
NOL	-0.046	-0.79	-0.020	-0.80	-0.040	-0.72	-0.019	-0.78	-0.094	-1.23	-0.040	-1.19
ForeignTax	0.030	0.53	0.007	0.28	0.028	0.49	0.006	0.26	0.026	0.36	0.011	0.37
CapitalInt	-0.347	-1.41	-0.121	-0.53	-0.349	-1.41	-0.130	-0.57	-0.358	-1.43	-0.115	-0.5
CashHold	0.227	1.60	-0.181**	-2.17	0.236	1.65	-0.172**	-2.07	0.254	1.53	-0.156*	-1.69
StockReturn	0.290	0.28	-0.633	-1.06	0.263	0.25	-0.617	-1.02	0.401	0.39	-0.655	-1.05
Growth	0.039*	1.85	0.004	0.40	0.039*	1.88	0.003	0.30	0.036	1.55	0.007	0.62
Big4	0.056	0.93	0.071	1.08	0.058	0.95	0.078	1.22	0.085	1.39	0.081	1.11
CrossList	-0.055	-1.19	-0.003	-0.13	-0.052	-1.13	-0.004	-0.14	-0.032	-0.64	0.002	0.07
Dividend	0.094	1.52	0.023	0.79	0.097	1.53	0.021	0.74	0.096	1.53	0.020	0.65
IMR	-0.388*	-1.79	0.103	0.86	-0.383*	-1.78	0.101	0.85	-0.323	-1.1	0.167	1.25
Constant	0.216	0.91	0.055	0.35	0.210	0.87	0.051	0.32	0.178	0.58	-0.026	-0.14
Industry FE	Yes				Yes				Yes			
Year FE	Yes				Yes				Yes			
Observations	483		1377		483		1377		400		1,156	
R-squared	0.143		0.094		0.146		0.098		0.167		0.100	
Prob > F	0.000		0.000		0.000		0.000		0.000		0.000	

This table reports results from the second state of the Heckman process based on equation (1) and (2) in financial crisis sub-samples. ETR are regressed on ExCOVER, moderators, and control variables. ETR is tax expenses divided by pre-tax income. ExCOVER is the residual in equation (3). ROA is net income scaled by lagged total assets. Z-Score is Altman Z-Score. Size is the natural log of total assets. Leverage is total liabilities divided by total assets. NOL is net operating loss, an indicator which equals one if tax loss carry forward is larger than 0, and zero otherwise. ForeignTax equals one if foreign income tax is larger than 0, and zero otherwise. CapitalInt is capital intensity, an indicator which equals one if foreign income tax is larger than 0, and zero otherwise. CashHold is cash and short-term investments over lagged total assets. StockReturn is the standard deviation of monthly stock return for the previous year. Growth is the sum of market value of equity and book value of total liabilities, divided by total assets. Big 4 equals one if the firm's financial statements are audited by a big-4 auditor, and zero otherwise. CrossList equals one if the Canadian public firm is cross-listed in the U.S., and zero otherwise. Dividend equals one if a firm declares dividends, and zero otherwise. *, **, and *** represents significance at 10%, 5%, and 1% levels, respectively.

Table 7 Main Effect and Moderating Effect with IV Approach

	1st Stage	2nd Stage DV: Effective Tax Rate								
	DV: Coverage	Main Effect			Moderator: ROA			Moderator: Z-Score		
		Main	Crisis	Non-Crisis	Main	Crisis	Non-Crisis	Main	Crisis	Non-Crisis
ExCOVER		-0.260***	0.134	-0.377***	-0.276***	0.107	-0.388***	-0.237**	0.106	-0.313**
		(-2.96)	(0.71)	(-3.72)	(-3.14)	(0.62)	(-3.77)	(-2.33)	(0.51)	(-2.36)
ROA	-0.122***	-0.001	-0.001	0.000	-0.001	-0.002	0.000	-0.001	-0.001	0.000
	(-3.53)	(-0.71)	(-0.97)	(0.03)	(-0.88)	(-1.26)	(0.07)	(-0.69)	(-0.78)	(0.03)
ROA*ExCOVER					0.010*	0.015	0.012**			
					(1.84)	(1.09)	(2.07)			
Z-Score								-0.001	-0.001	-0.001
								(-1.55)	(-0.34)	(-1.26)
Z-Score*ExCOV								0.009***	0.003	0.009**
								(3.10)	(0.45)	(2.57)
Size	-0.037***	0.004	0.013	-0.004	0.003	0.012	-0.004	0.011	0.015	0.002
	(-10.30)	(0.39)	(0.67)	(-0.35)	(0.36)	(0.62)	(-0.35)	(0.88)	(0.62)	(0.11)
Leverage	0.073***	-0.012	0.019	0.018	-0.010	0.025	0.016	-0.032	0.041	-0.016
	(3.23)	(-0.18)	(0.10)	(0.29)	(-0.16)	(0.13)	(0.26)	(-0.42)	(0.16)	(-0.23)
NOL		-0.027	-0.052	-0.018	-0.026	-0.047	-0.018	-0.051	-0.102	-0.039
		(-1.10)	(-0.86)	(-0.66)	(-1.08)	(-0.82)	(-0.67)	(-1.51)	(-1.22)	(-1.02)
ForeignTax		0.013	0.022	0.003	0.013	0.020	0.003	0.012	0.017	0.007
		(0.51)	(0.38)	(0.10)	(0.51)	(0.35)	(0.11)	(0.42)	(0.23)	(0.22)
CapitalInt		-0.161	-0.348	-0.141	-0.167	-0.353	-0.145	-0.146	-0.365	-0.119
		(-0.84)	(-1.41)	(-0.58)	(-0.87)	(-1.42)	(-0.60)	(-0.75)	(-1.46)	(-0.48)
CashHold	0.061***	-0.065	0.254*	-0.187**	-0.060	0.262*	-0.182**	-0.024	0.280	-0.159
	(2.61)	(-0.86)	(1.67)	(-2.08)	(-0.80)	(1.72)	(-2.04)	(-0.29)	(1.57)	(-1.58)
StockReturn	1.087***	-0.356	0.295	-0.387	-0.330	0.324	-0.328	-0.294	0.378	-0.420
	(4.56)	(-0.64)	(0.28)	(-0.58)	(-0.60)	(0.31)	(-0.49)	(-0.51)	(0.36)	(-0.61)
Growth	-0.022***	0.014	0.038*	0.003	0.013	0.038*	0.001	0.018*	0.035	0.007
	(-5.13)	(1.53)	(1.78)	(0.25)	(1.44)	(1.79)	(0.07)	(1.8)	(1.49)	(0.62)
Big4	0.007	0.083*	0.050	0.100	0.085*	0.050	0.106	0.110**	0.080	0.115

	(0.50)	(1.82)	(0.83)	(1.45)	(1.86)	(0.81)	(1.57)	(2.26)	(1.31)	(1.50)
CrossList	0.024***	-0.013	-0.067	0.003	-0.013	-0.064	0.004	-0.011	-0.046	0.006
	(2.75)	(-0.56)	(-1.35)	(0.10)	(-0.52)	(-1.31)	(0.13)	(-0.40)	(-0.86)	(0.18)
Dividend		0.040	0.092	0.025	0.042	0.097	0.025	0.041	0.094	0.022
		(1.38)	(1.40)	(0.82)	(1.42)	(1.45)	(0.81)	(1.33)	(1.40)	(0.66)
IMR		-0.017	-0.329	0.093	-0.015	-0.326	0.092	0.039	-0.269	0.149
		(-0.16)	(-1.40)	(0.75)	(-0.15)	(-1.40)	(0.75)	(0.33)	(-0.87)	(1.08)
Industry Average Coverage	0.000***									
	(3.07)									
Technology	-0.067***									
	(-3.50)									
Regulated	0.050***									
	(5.40)									
Litigation	0.045**									
	(2.07)									
Environmental	0.004									
	(0.40)									
Constant	0.210***	0.078	0.154	0.063	0.080	0.152	0.060	-0.044	0.124	-0.036
	(6.85)	(0.57)	(0.61)	(0.37)	(0.58)	(0.60)	(0.35)	(-0.29)	(0.38)	(-0.19)
Industry FE	Yes		Yes			Yes			Yes	
Year FE	Yes		Yes			Yes			Yes	
Observations	1925	1719	469	1250	1719	469	1250	1430	386	1044
R-squared	0.455	0.079	0.139	0.092	0.080	0.142	0.094	0.086	0.163	0.099
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

This table reports the results of main and moderating effects under 2SLS instrumental variable approach. ETR are regressed on ExCOVER, moderators, and control variables. ETR is tax expenses divided by pre-tax income. ExCOVER is the residual in equation (3). ROA is net income scaled by lagged total assets. Z-Score is Altman Z-Score. Size is the natural log of total assets. Leverage is total liabilities divided by total assets. NOL is net operating loss, an indicator which equals one if tax loss carry forward is larger than 0, and zero otherwise. ForeignTax equals one if foreign income tax is larger than 0, and zero otherwise. CapitalInt is capital intensity, an indicator which equals one if foreign income tax is larger than 0, and zero otherwise. CashHold is cash and short-term investments over lagged total assets. StockReturn is the standard deviation of monthly stock return for the previous year. Growth is the sum of market value of equity and book value of total liabilities, divided by total assets. Big 4 equals one if the firm's financial statements are audited by a big-4 auditor, and zero otherwise. CrossList equals one if the Canadian public firm is cross-listed in the U.S., and zero otherwise. Dividend equals one if a firm declares dividends, and zero otherwise.

*, **, and *** represents significance at 10%, 5%, and 1% levels, respectively.

Table 8 Main Effect and Moderating Effects with Alternative Coverage Measure

DV: Effective Tax Rate																		
	Main Effect						Moderator: ROA						Moderator: Z-Score					
	Main		Crisis		Non-Crisis		Main		Crisis		Non-Crisis		Main		Crisis		Non-Crisis	
	Coef.	t-value	Coef.	t-value	Coef.	t-value	Coef.	t-value	Coef.	t-value	Coef.	t-value	Coef.	t-value	Coef.	t-value	Coef.	t-value
ExCOVER	-0.218***	-2.75	0.102	0.57	-0.295***	-3.24	-0.239***	-3.02	0.067	0.41	-0.306***	-3.30	-0.199**	-2.20	0.083	0.41	-0.240**	-2.10
ROA	-0.000	-0.66	-0.001	-1.11	0.000	0.04	-0.001	-0.96	-0.002	-1.40	0.000	0.02	-0.000	-0.57	-0.001	-0.86	0.000	0.09
ROA*ExCOVER							0.012***	2.73	0.013	1.12	0.015***	3.02						
Z-Score													-0.001	-1.62	-0.001	-0.42	-0.001	-1.15
Z-Score*ExCOV													0.009***	3.26	0.003	0.51	0.009***	2.79
Size	0.004	0.45	0.006	0.34	-0.001	-0.05	0.004	0.43	0.005	0.30	-0.001	-0.06	0.011	0.93	0.009	0.37	0.005	0.36
Leverage	0.005	0.09	0.023	0.12	0.037	0.65	0.010	0.16	0.025	0.13	0.039	0.68	-0.009	-0.13	0.041	0.16	0.015	0.23
NOL	-0.027	-1.18	-0.046	-0.79	-0.022	-0.88	-0.026	-1.14	-0.040	-0.71	-0.021	-0.86	-0.050*	-1.65	-0.094	-1.23	-0.043	-1.27
ForeignTax	0.015	0.65	0.030	0.53	0.006	0.22	0.015	0.63	0.028	0.49	0.005	0.21	0.016	0.58	0.026	0.36	0.010	0.33
CapitalInt	-0.148	-0.82	-0.347	-1.41	-0.135	-0.59	-0.159	-0.88	-0.349	-1.41	-0.145	-0.64	-0.142	-0.77	-0.358	-1.43	-0.127	-0.56
CashHold	-0.066	-0.91	0.227	1.60	-0.173**	-2.04	-0.056	-0.78	0.235	1.64	-0.164*	-1.93	-0.028	-0.35	0.254	1.53	-0.146	-1.55
StockReturn	-0.457	-0.90	0.287	0.28	-0.611	-1.03	-0.472	-0.93	0.260	0.25	-0.595	-0.99	-0.379	-0.72	0.401	0.39	-0.628	-1.02
Growth	0.015	1.59	0.039*	1.86	0.005	0.45	0.014	1.56	0.039*	1.88	0.004	0.34	0.018*	1.80	0.036	1.55	0.008	0.71
Big4	0.068	1.56	0.056	0.93	0.071	1.07	0.071	1.63	0.058	0.95	0.078	1.20	0.091*	1.95	0.085	1.39	0.081	1.09
CrossList	-0.017	-0.77	-0.055	-1.18	-0.003	-0.11	-0.017	-0.74	-0.052	-1.13	-0.003	-0.12	-0.014	-0.52	-0.032	-0.64	0.003	0.08
Dividend	0.037	1.35	0.094	1.51	0.023	0.81	0.037	1.35	0.097	1.53	0.022	0.75	0.038	1.31	0.096	1.53	0.021	0.66
IMR	-0.029	-0.28	-0.388*	-1.80	0.105	0.88	-0.027	-0.27	-0.383*	-1.78	0.103	0.87	0.029	0.25	-0.323	-1.10	0.172	1.29
Constant	0.085	0.67	0.217	0.91	0.047	0.29	0.082	0.65	0.210	0.87	0.043	0.27	-0.025	-0.17	0.177	0.57	-0.042	-0.23
Industry FE			Yes						Yes						Yes			
Year FE			Yes						Yes						Yes			
Observations	1854		483		1371		1854		483		1371		1551		400		1151	
R-squared	0.080		0.143		0.093		0.083		0.146		0.097		0.086		0.167		0.100	
Prob > F	0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	

This table reports the results of main and moderating effects with an alternative coverage as robustness checks. The residual of equation (3) is re-estimated by using an alternative measure of coverage limit as the dependent variable. ETR are regressed on ExCOVER, moderators, and control variables. ETR is tax expenses divided by pre-tax income. ExCOVER is the residual in equation (3). ROA is net income scaled by lagged total assets. Z-Score is Altman Z-Score. Size is the natural log of total assets. Leverage is total liabilities divided by total assets. NOL is net operating loss, an indicator which equals one if tax loss carry forward is larger than 0, and zero otherwise. ForeignTax equals one if foreign income tax is larger than 0, and zero otherwise. CapitalInt is capital intensity, an indicator which equals one if foreign income tax is larger than 0, and zero otherwise. CashHold is cash and short-term investments over lagged total assets. StockReturn is the standard deviation of monthly stock return for the previous year. Growth is the sum of market value of equity and book value of total liabilities, divided by total assets. Big 4 equals one if the firm's financial statements are audited by a big-4 auditor, and zero otherwise. CrossList equals one if the Canadian public firm is cross-listed in the U.S., and zero otherwise. Dividend equals one if a firm declares dividends, and zero otherwise. *, **, and *** represents significance at 10%, 5%, and 1% levels, respectively.

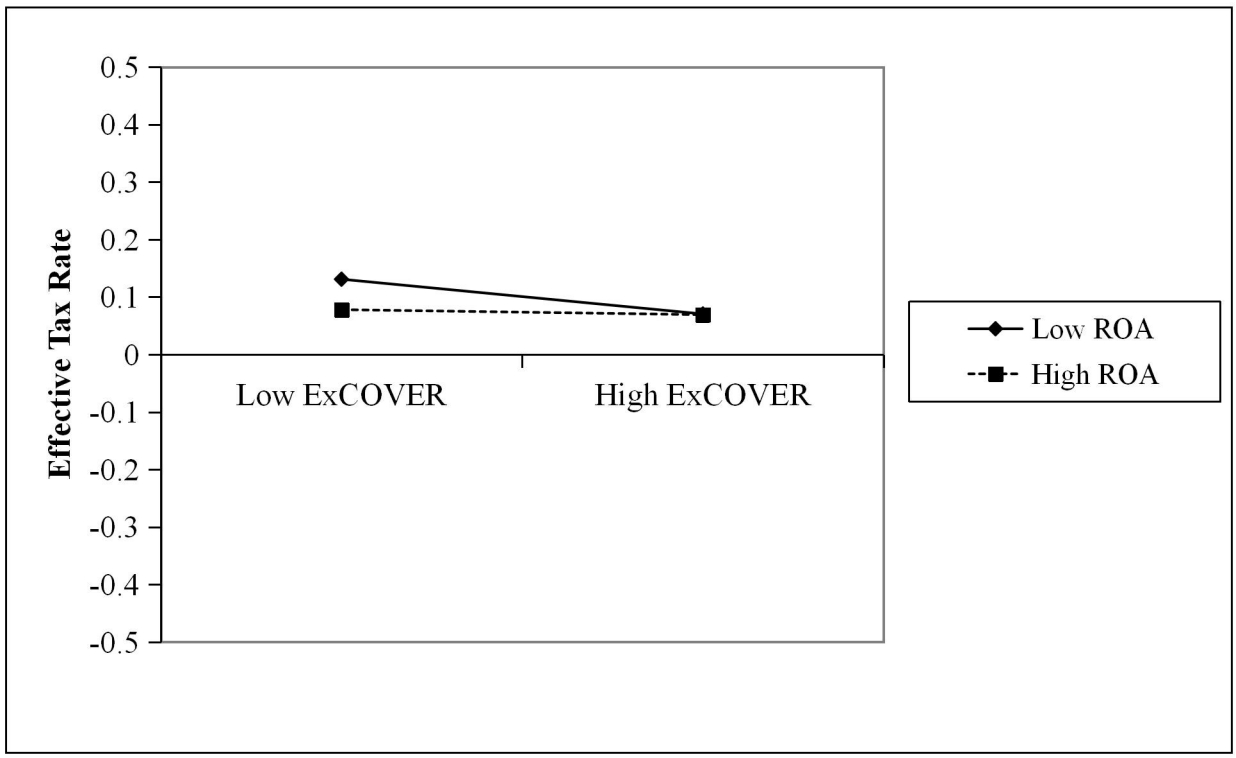
Table 9 Main Effect and Moderating Effects with Regulated and Financial Firms Excluded

	DV: Effective Tax Rate																	
	Main Effect						Moderator: ROA						Moderator: Z-Score					
	Main		Crisis		Non-Crisis		Main		Crisis		Non-Crisis		Main		Crisis		Non-Crisis	
	Coef.	t-value	Coef.	t-value	Coef.	t-value	Coef.	t-value	Coef.	t-value	Coef.	t-value	Coef.	t-value	Coef.	t-value	Coef.	t-value
ExCOVER	-0.251***	-3.12	0.080	0.43	-0.327***	-3.25	-0.277***	-3.47	0.036	0.21	-0.339***	-3.35	-0.193**	-2.19	0.087	0.44	-0.255**	-2.23
ROA	-0.000	-0.61	-0.001	-0.63	-0.000	-0.08	-0.001	-0.93	-0.002	-1.19	-0.000	-0.16	-0.000	-0.62	-0.001	-0.64	-0.000	-0.07
ROA*ExCOVER							0.012***	2.70	0.014	1.37	0.014***	2.88						
Z-Score													-0.001***	-2.99	-0.001	-1.08	-0.001**	-2.53
Z-Score*ExCOVER													0.008***	3.28	0.003	0.52	0.009***	2.78
Size	0.003	0.23	-0.006	-0.20	-0.000	-0.02	0.003	0.24	-0.007	-0.24	0.000	0.02	0.013	1.01	0.004	0.15	0.010	0.66
Leverage	0.019	0.28	-0.001	-0.00	0.072	1.20	0.025	0.37	0.000	0.00	0.077	1.25	-0.029	-0.40	-0.062	-0.23	0.031	0.48
NOL	-0.064**	-2.00	-0.076	-0.91	-0.077**	-2.30	-0.062**	-1.97	-0.065	-0.83	-0.076**	-2.28	-0.068**	-2.12	-0.081	-0.98	-0.080**	-2.31
ForeignTax	0.034	1.14	0.075	1.07	0.018	0.53	0.032	1.07	0.070	1.00	0.017	0.49	0.035	1.17	0.075	1.07	0.020	0.58
CapitalInt	-0.266	-1.43	-0.422	-1.66	-0.279	-1.19	-0.284	-1.53	-0.427*	-1.67	-0.296	-1.26	-0.228	-1.22	-0.380	-1.49	-0.247	-1.06
CashHold	-0.117	-1.45	0.194	1.42	-0.246**	-2.50	-0.105	-1.29	0.208	1.51	-0.234**	-2.39	-0.084	-1.05	0.217	1.42	-0.205**	-2.11
StockReturn	-0.264	-0.51	0.565	0.56	-0.465	-0.71	-0.292	-0.55	0.511	0.50	-0.457	-0.69	-0.301	-0.57	0.598	0.57	-0.555	-0.86
Growth	0.011	1.12	0.019	0.86	0.005	0.46	0.011	1.11	0.020	0.90	0.004	0.37	0.015	1.46	0.020	0.89	0.010	0.82
Big4	0.062	1.42	0.037	0.80	0.096	1.37	0.066	1.52	0.040	0.85	0.105	1.54	0.063	1.39	0.030	0.66	0.100	1.37
CrossList	-0.022	-0.80	0.026	0.52	-0.029	-0.89	-0.023	-0.85	0.028	0.58	-0.031	-0.95	-0.020	-0.73	0.025	0.50	-0.027	-0.83
Dividend	0.052*	1.81	0.171***	3.18	0.012	0.38	0.053*	1.83	0.175***	3.17	0.011	0.34	0.057**	2.01	0.174***	3.23	0.016	0.51
IMR	-0.037	-0.32	-0.164	-0.70	0.023	0.17	-0.034	-0.29	-0.164	-0.70	0.026	0.19	0.076	0.68	-0.041	-0.17	0.137	1.03
Constant	0.135	0.88	0.204	0.64	0.138	0.72	0.129	0.85	0.197	0.61	0.126	0.67	-0.021	-0.14	0.055	0.18	-0.028	-0.15
Industry FE			Yes						Yes						Yes			
Year FE			Yes						Yes						Yes			
Observations	1417		377		1040		1417		377		1040		1413		377		1036	
R-squared	0.088		0.179		0.102		0.091		0.183		0.106		0.092		0.181		0.109	
Prob > F	0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000		0.000	

This table reports the main and moderating effects excluding regulated and financial firms as additional tests. ETR are regressed on ExCOVER, moderators, and control variables. ETR is tax expenses divided by pre-tax income. ExCOVER is the residual in equation (3). ROA is net income scaled by lagged total assets. Z-Score is Altman Z-Score. Size is the natural log of total assets. Leverage is total liabilities divided by total assets. NOL is net operating loss, an indicator which equals one if tax loss carry forward is larger than 0, and zero otherwise. ForeignTax equals one if foreign income tax is larger than 0, and zero otherwise. CapitalInt is capital intensity, an indicator which equals one if foreign income tax is larger than 0, and zero otherwise. CashHold is cash and short-term investments over lagged total assets. StockReturn is the standard deviation of monthly stock return for the previous year. Growth is the sum of market value of equity and book value of total liabilities, divided by total assets. Big 4 equals one if the firm's financial statements are audited by a big-4 auditor, and zero otherwise. CrossList equals one if the Canadian public firm is cross-listed in the U.S., and zero otherwise. Dividend equals one if a firm declares dividends, and zero otherwise.
*, **, and *** represents significance at 10%, 5%, and 1% levels, respectively.

List of Figures

Figure 1 Interactions between ExCOVER and ROA/Z-score Full Sample



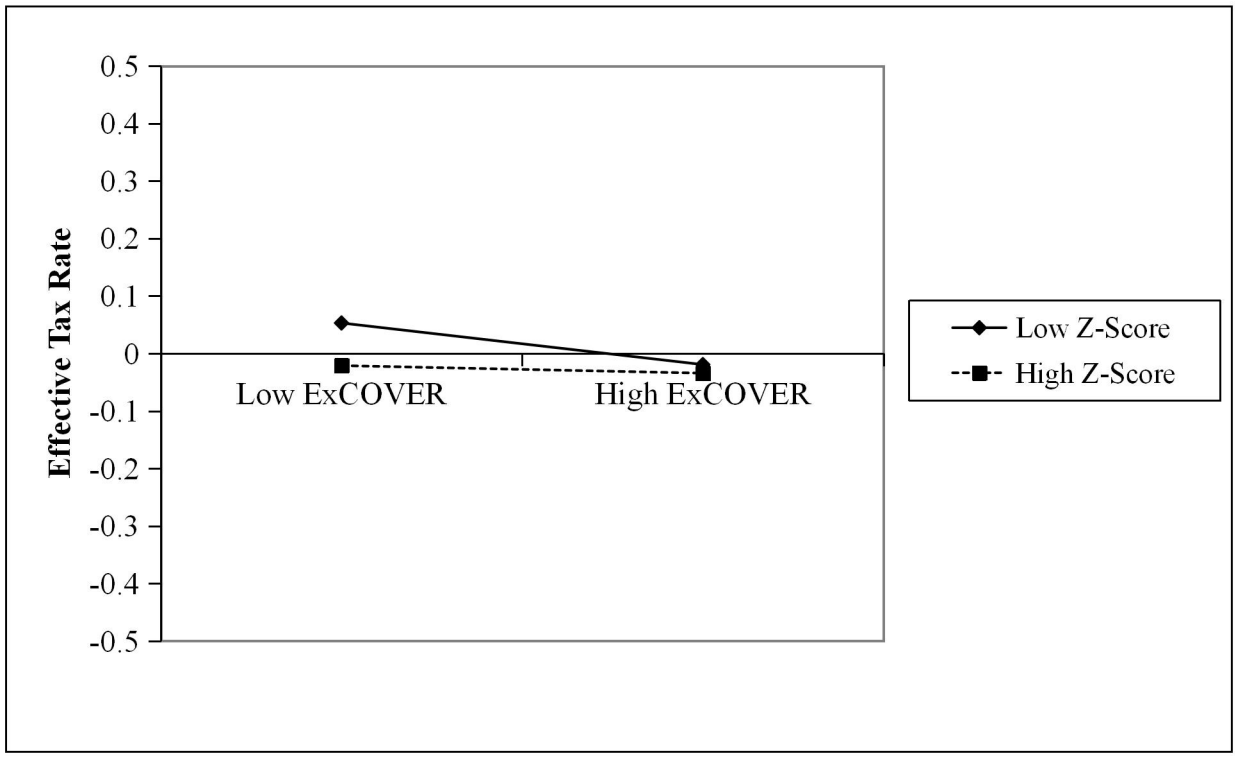
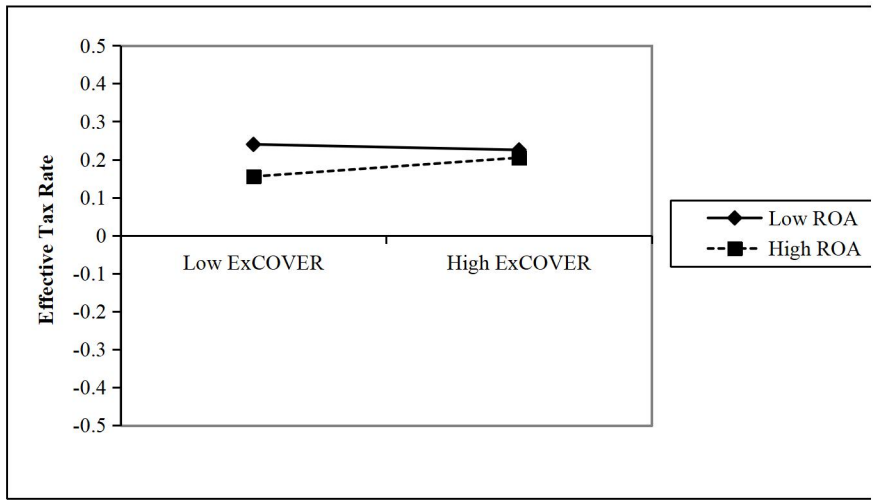


Figure 2 Interactions between ExCOVER and ROA/Z-score During Crisis Period



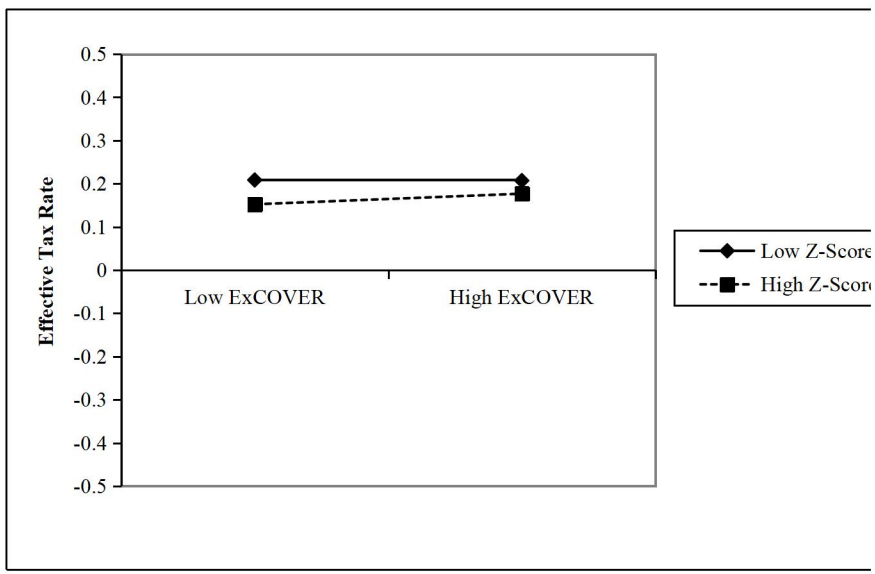


Figure 3 Interactions between ExCOVER and ROA/Z-score During Non-crisis Period