

Corporate Social Responsibility and Directors' and Officers' Liability Risk: The Moderating Effect of Risk Environment and Growth Potential

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Abstract

Theoretical arguments regarding the effect of corporate social responsibility (CSR) on firm liability risk are abundant; however, empirical evidence about this relationship is scarce. We investigate the relationship between CSR and the personal liability risk of a firm's directors and officers. We argue that companies with better CSR performance represent a better underwriting risk for directors' and officers' (D&O) insurance providers and, therefore, have a lower cost of insurance. Our results show that firms with better CSR performance are more likely to purchase D&O insurance and have a lower premium-to-coverage ratio, known as the insurance *rate-on-line*. We also show that this risk-reduction effect is stronger for firms that operate in a high-risk environment and have higher sales growth. These results provide evidence that CSR can be used as a risk management tool to mitigate liability risk and suggest which firms benefit most from this effect.

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Can decision-makers of profit-seeking companies reduce their own liability risk by being more environmentally and socially responsible? This question traces back to the ongoing debate between the shareholder supremacy view (Friedman, 1970), which holds that the only responsibility of a firm is to increase shareholder value, and the stakeholder view of the firm (Donaldson & Preston, 1995; Freeman, 1984; Freeman & Phillips, 2002), which states that a firm is responsible to all stakeholders and not only shareholders. Many scholars attempt to reconcile the shareholder versus stakeholder positions with an instrumental view (Barnett, 2007; Clarkson, 1995; Hillman & Keim, 2001; Jones, 1995) that holds that stakeholder-centric corporate social responsibility (CSR) can lead to extrinsic value creation for shareholders. As a result, the two seemingly divergent views of CSR can lead to similar outcomes (Harrison & Freeman, 1999; Jones, 1995; Jones & Wicks, 1999). Utilizing the instrumental CSR theory, many scholars argue that CSR can serve as a risk-reduction mechanism (Lu et al., 2021) because being socially and environmentally responsible improves stakeholder trust and social legitimacy, thereby reducing the liability risk of a firm (Brown et al., 2001; Koh et al., 2014).

The current literature on the link between CSR and liability risk has three main gaps. First, although liability risk reflects both the frequency and severity of events, to our knowledge, current studies tend to investigate only one of the two components, and tend to measure them from an *ex post* perspective. That is, current research either uses the *ex post* frequency (Boyer & Kordonsky, 2020; Koh et al., 2014) or the *ex post* severity of losses (Godfrey et al., 2009; Muller & Kräussl, 2011b; Shiu & Yang, 2017) as the proxy for liability risk. Examining only one aspect is problematic because it does not reflect the true risk the firm faces *ex ante*. For example, high-frequency losses may not be alarming to managers if the possible size of the losses is small, whereas a low-frequency loss with potentially very high severity impacts may be intolerable. Second, current research on the relationship between CSR and liability risk mainly focuses on establishing a relationship but ignores the possible contingencies of such a relationship. Previous literature has shown that the financial benefit of CSR can only be realized under certain firm-specific and industry-specific conditions (Brower & Dacin, 2020; Lu et al., 2021; Sun et al., 2019; Wang et al., 2016). Therefore, understanding the conditions under which CSR provides risk-reduction benefits offers both

theoretical contribution and practical implications. Third, although research exists that investigates the link between CSR and total litigation risk, we are not aware of any research that links CSR performance with any managerial liability risk or the financial instrument used to manage any of these liability risks. For instance, no research, to our knowledge, investigates whether CSR reduces the risk of firm managers being sued as the organization's representatives (i.e., directors' and officers' [D&O] liability risk). Since the most common cases in D&O liability litigations are security (shareholder) type lawsuits (Boettrich & Starykh, 2017; Comolli & Starykh, 2014; Heys et al., 2014), understanding CSR's impact on D&O liability risk can help to better align the interests of shareholders and managers.

Using a sample of Canadian publicly traded firms, we test the relationship between CSR performance and the D&O insurance premium rate per unit of coverage, known as the rate-on-line (RoL), as well as the likelihood of firms purchasing D&O insurance. Our results support the hypothesis that firms with better CSR performance pay less per dollar of D&O coverage, reflecting their lower liability risk. The lower price reduces the cost of risk transfer, and consequently, increases the probability of purchasing D&O insurance. Moreover, our results show that the risk-reduction effect of CSR is more significant when the firm operates in a high-risk context and has high growth opportunities. These results suggest that CSR is an effective risk management tool that reduces the risk of D&O liability and therefore the cost of risk transfer.

This research offers two main theoretical contributions to the literature. First, we investigate how CSR affects one specific firm risk—directors' and officers' liability risk—arguing that companies with better CSR performance represent a better underwriting risk for D&O insurance providers. We contend that, compared with capital markets, insurers specialized in D&O insurance should have superior information about the liability risk faced by directors and officers (Baker & Griffith, 2007, 2008). D&O insurance contract parameters, and in particular the price paid per unit of coverage, should, therefore, reflect the expected frequency and severity of D&O liability risk (Boyer & Stern, 2014). This provides justification for using D&O insurance as a proxy for the liability risk faced by a firm's directors and officers (Baker & Griffith, 2007; Boyer & Stern, 2012). If CSR reduces D&O liability risk, we expect that D&O insurance premium rates will be negatively related to CSR performance.

Second, we contribute to the current literature by investigating conditions that can influence the risk-reduction mechanism of CSR. Specifically, we attempt to understand whether the risk-reduction mechanism of CSR is monotonic for all firms that operate in different risk environments and have

different growth potential. Hence, our findings provide theoretical contributions by answering not only the “if” question but also the “when” question. Moreover, by investigating possible contingencies of the CSR-liability risk relationship, we provide guidance to managers and to investors about when better CSR performance contributes to risk reduction.

The remainder of the article is structured as follows. In the next section, we discuss the uniqueness and appropriateness of the Canadian context to this research. Current relevant theories are surveyed in the “Theoretical Background” section. We discuss relevant empirical studies and develop the main hypotheses in the “Empirical Literature Review and Hypotheses Development” section. In the “Empirical Method” section, we discuss our sample collection and quantitative analysis procedures. The “Results” section describes the empirical results and further discusses the economic implications of our findings. We conclude with a discussion about our contribution and how it relates to the existing literature.

CSR and Directors’ and Officers’ Liability Risk Within the Canadian Context

We use Canada as the testing ground for examining the link between CSR performance and D&O liability insurance due to the organizational and judicial structure of its capital market and because of the social and regulatory norms that apply to information about corporate D&O liability insurance purchases. Specifically, there are four reasons why we use Canadian publicly listed firms for our study. First, and unlike public firms in the United States, firms listed on the Toronto Stock Exchange (TSX) disclose basic D&O insurance information in their annual management information circulars, along with the necessary information about the board of directors (Core, 1997; Lin et al., 2011, 2013; Wynn, 2008). Second, Canada is the only OECD country where D&O insurance information and CSR ratings are available for a large subset of public firms, which allows us to link D&O insurance information with CSR performance measures. Third, scholars have argued that the Canadian market is comparable with other markets, such as the United States, in terms of D&O insurance premiums and coverage (Lin et al., 2011, 2013). Finally, legal systems in Canada, the United Kingdom, and the United States are mainly based on British common-law principles. Lin and colleagues (2013) argue that the securities laws are similar, so the results offer insights to other markets, even if litigation risk is higher in the United States than in Canada (Boyer, 2014b; Heys et al., 2014). In addition, the Canadian context has been used widely in research regarding

D&O liability risk and insurance (Boyer & Stern, 2012; Boyer & Tennyson, 2015; Chen & Chang, 2011; Gillan & Panasian, 2015). The percentage of firms with D&O insurance coverage in Canada is close to 86%, which is comparable to the United States (Lin et al., 2013; Yuan et al., 2016). For these reasons, it is expected that the Canadian setting will provide insight into what is happening in other jurisdictions.

Although legal and financial systems in Canada and the United States are similar, the Canadian context draws less attention from scholars in understanding the efficacy of CSR than the United States, Europe or China. Research using Canadian firms tends to show that CSR has a greater impact on financial risk than profitability measures. With respect to profitability, Mahoney and Roberts (2007) find that high environmental performance leads to an increase in the number of institutions investing in the firm, as well as better financial performance. In contrast, Makni and colleagues (2009) find either no significant relationship between overall CSR and financial performance, or a detrimental effect of environmental performance on profitability. May and Khare (2008) confirm that the relationship between CSR and financial performance is at best mixed.

With respect to the relationship between CSR and risk, studies generally find risk-reduction effects similar to results in other jurisdictions. For example, the negative relationship between CSR and firm idiosyncratic risk in Boutin-Dufresne and Savaria (2004) using a Canadian sample aligns with findings for other jurisdictions (Luo & Bhattacharya, 2009; Mishra & Modi, 2013). Other studies also find a negative relationship between CSR and litigation risk in Canada (Boyer & Kordonsky, 2020) and abroad (Koh et al., 2014). Therefore, regarding studies that investigate the risk-reduction effect of CSR, empirical findings using Canadian data should not suffer from generalizability issues.

Theoretical Background

The Risk-Reduction Mechanism of CSR

Recent developments in the instrumental CSR theory identify two main mechanisms through which CSR can impact firm value: *risk reduction* (Albuquerque et al., 2019; Godfrey, 2005; Godfrey et al., 2009; Koh et al., 2014; Shiu & Yang, 2017) and *efficiency improvement* (Flammer, 2015, 2018; Hillman & Keim, 2001).

According to the *risk-reduction* argument, CSR activities reduce liability risk along two paths. First, good CSR practices mitigate information asymmetry between the firm and its stakeholders, reducing the probability of the

firm being sued *ex ante* (Boutin-Dufresne & Savaria, 2004; Lu, Liu, & Falkenberg, 2022; Orlitzky & Benjamin, 2001). Since investors and other stakeholders use CSR disclosure and CSR performance as key indicators of firm capabilities (Lu & Abeyssekera, 2021; Saxton et al., 2019), high CSR performance is a positive signal of future performance and financial stability. Second, conducting business in a socially and environmentally responsible way improves corporate reputation and creates moral capital (Godfrey, 2005; Godfrey et al., 2009; Shiu & Yang, 2017), thereby reducing the severity of liability risk by reducing stakeholder sanctions arising from negative events (Godfrey et al., 2009). In contrast, conducting business in an irresponsible way leads to greater sanctions (Muller & Kräussl, 2011a) and an increased cost of financing (Ma et al., 2022).

The existing empirical evidence on the CSR–risk relationship focuses on establishing CSR’s impact on firm idiosyncratic and systematic risk at the aggregate level (Albuquerque et al., 2019; Boutin-Dufresne & Savaria, 2004; Jo & Na, 2012; Liu et al., 2021). In particular, Jo and Na (2012) find that CSR reduces total risk, as measured by the volatility of stock returns, whereas Albuquerque and colleagues (2019) confirm that better CSR performance reduces systematic risk by increasing customer loyalty, thereby reducing price elasticity. Using the volatility of residual variance from a six-factor Capital Asset Pricing Model (CAPM), Lee and Faff (2009) discover that firms with better CSR performance have significantly lower idiosyncratic risk than firms with poorer CSR performance. Mishra and Modi (2013) extend this discussion by showing that positive (respectively negative) CSR performance reduces (respectively increases) idiosyncratic risk. Liu and colleagues (2021) find that although CSR can be a risk-reduction tool on its own, the combined effect of CSR and innovation increases financial risk. Finally, with respect to financing costs, which are equivalent to the firm’s systemic risk in the CAPM context, firms with better CSR performance have a lower cost of equity financing (El Ghouli et al., 2011) and firms with poorer CSR performance have a higher cost of debt financing (Goss & Roberts, 2011).

There are two problems that arise when investigating the CSR-risk relationship using aggregate risk. First, the aggregation of risk hinders our ability to pinpoint the mechanisms through which CSR reduces risk. That is, we are not able to identify whether CSR reduces a specific type of risk, such as firm liability risk, or whether firms that have high CSR scores are just better at coping with one of the hidden noises embedded in the aggregate risk measure, such as managerial capabilities (Lu et al., 2021; Russo & Fouts, 1997), government interactions (Flammer, 2018), financial distress (Boubaker et al., 2020), or economic downturn (Albuquerque et al., 2020). Second,

understanding the relationship between CSR and aggregate risk provides little guidance to practitioners. Since investors can diversify idiosyncratic risk efficiently using the capital market (Evans & Archer, 1968; Fung, 1979; Theobald, 1979), they require evidence regarding CSR's impact on actual risk in order to evaluate its efficacy and value (Hemingway & Maclagan, 2004). This leads to a possible additional agency conflict when managers divert valuable resources to CSR without sufficient justification (Masulis & Reza, 2015).

Given the limitations associated with examining the CSR–risk relationship using aggregate risk, some studies have investigated how CSR interacts with firm liability risk. In one of the earliest studies on the topic, Blacconiere and Patten (1994) find that after the 1984 Union Carbide chemical leak, firms with a proactive environmental reporting strategy faced less reaction from stakeholders than other firms. Scholars have also found that firms with good CSR scores experience less negative stock reactions after a disastrous event (Godfrey et al., 2009), whereas firms with reputations for being socially irresponsible experience a greater negative impact, requiring an increase in charitable donations to recover (Muller & Kräussl, 2011a). Koh and colleagues (2014) find that CSR's effect as a value-enhancing mechanism is stronger when a firm faces a higher level of litigation risk *ex ante*. They argue that this is because investors are more likely to value CSR as a risk-mitigation tool when the firm is in an industry with high liability risk. More direct evidence comes from Boyer and Kordonsky (2020), who find that firms with a higher probability of facing a class-action lawsuit *ex ante* invest more in CSR activities, which reduces the probability of a class-action lawsuit *ex post*.

Directors' and Officers' Liability Risk and Directors' and Officers' Insurance Premium

We examine the impact of CSR performance on D&O insurance premiums. This is relevant because D&O insurance is designed to cover the costs of litigation and indemnification that are incurred if a firm's directors or officers are sued in relation to their services to the firm, provided that they acted honestly and in good faith (Core, 1997). The D&O insurance premium provides an *ex ante* measure of D&O liability risk and also incorporates both frequency and severity, reflecting a more accurate assessment of the D&O liability risk than measures that only incorporate one or the other.

Given their experience in underwriting D&O insurance, insurers are in a good position to assess the liability risk faced by corporate directors and officers. Insurers also possess superior information regarding a firm's internal

structure and loss characteristics (Baker & Griffith, 2007; Boyer & Stern, 2014). As a result, profit-seeking insurers that have the ability and the financial incentive to properly assess a firm's litigation risk will charge firms a premium per unit of D&O insurance coverage that reflects their level of risk. Hence, the premium-to-coverage ratio—also known as the *unit price* of insurance or the *RoL*—is a good *ex ante* indicator of D&O liability risk (Boyer & Stern, 2014).

Our main argument is that there should be a causal link between CSR performance and the pricing of liability protection for directors and officers, whereby firms that have worse CSR performance must pay greater D&O liability insurance premiums for the same level of coverage. Previous research, as referenced earlier, shows a direct link between CSR performance and firm financial *risk* (Albuquerque et al., 2019; Godfrey, 2005; Godfrey et al., 2009; Koh et al., 2014; Shiu & Yang, 2017), even if the link between CSR and financial *performance* is not as clear (May & Khare, 2008). Other studies have established that there is a link between firm risk and D&O liability insurance pricing (Core, 1997; Gillan & Panasian, 2015, *inter alia*). Connecting these two streams of literature, our research tries to show a direct link between CSR performance and D&O insurance pricing, thus acting as a bridge between the aforementioned literature and providing more direct evidence of the risk-reduction mechanism of CSR.

Empirical Literature Review and Hypothesis Development

CSR and D&O Liability Risk

Empirical research on D&O insurance is extensive. And despite a general lack of data in most jurisdictions, results are generally consistent with theoretical predictions. For instance, Core (2000) presents the results in line with the hypothesis that D&O insurance is necessary to attract competent directors (Chen & Chang, 2011). In line with the corporate risk management hypothesis of D&O insurance, Boyer and Stern (2012) find that, due to the complex governance structure of income trusts, common equity firms pay less than income trusts for D&O insurance coverage (Boyer & Stern, 2014). Surprisingly, there is little known about how firms can reduce director liability risk. One possible way to reduce liability risk is by improving CSR performance.

There are three ways in which CSR performance can affect D&O liability risk. First, from an external perspective, CSR creates moral capital and reduces reputation risk (Heal, 2005) and can therefore lower a firm's overall

litigation risk and the liability risk faced by firm managers (Boyer & Kordonsky, 2020). Second, CSR can help reduce firm risk by reducing stakeholder and government sanctions arising from negative events (Godfrey et al., 2009; Shiu & Yang, 2017), since positive CSR performance increases customer loyalty and reduces their demand elasticity (Albuquerque et al., 2019). Third, from an internal perspective, CSR can help managers deal with the firm's stakeholders (Cantrell et al., 2015) and improve their ability to manage risk (Lu, Liu, & Falkenberg, 2022). As a result, firms with higher CSR performance should be better at managing relationships with key stakeholders and identifying liability risk *ex ante*.

These theoretical arguments imply that CSR performance is expected to affect both the severity (Godfrey, 2005; Godfrey et al., 2009) and the frequency (Boyer & Kordonsky, 2020; Koh et al., 2014) of lawsuits against a firm's directors and officers, thus reducing their liability risk and the premiums paid for D&O insurance. Given that the primary source of D&O liability risk stems from shareholders' legal actions due to economic losses (Boyer, 2014a; Boyer & Tennyson, 2015), actions that mitigate a firm's economic losses, including superior CSR performance, are expected to reduce a firm's liability risk and its D&O liability insurance premium. Therefore, our first main hypothesis is stated as follows:

Hypothesis 1 (H1): Firms with better CSR performance have lower D&O liability risk, as reflected by a lower D&O liability insurance RoL.

To test this hypothesis, we must have access not only to whether a firm has purchased D&O insurance but also to the D&O insurance contract's basic parameters (amount of coverage and premium), which are necessary to calculate the contract's RoL. However, some firms choose to remain uninsured. If CSR leads to an increased probability of no insurance, then the relationship between CSR and D&O insurance premium established in H1 could suffer from selection bias. That is, if high-CSR firms are more likely to be uninsured, then establishing the relationship between CSR and D&O insurance RoL from the remaining sample will be biased. To examine the relationship between CSR & D&O liability risk, we need to consider both the decision to purchase D&O insurance and the probability of a claim arising. On one hand, if CSR reduces managerial liability risk (and thus the unit price of insurance), then microeconomic theory predicts an increase in the demand for D&O insurance for high-CSR firms. This would imply a positive relationship between CSR performance and the probability of purchasing D&O insurance. On the other hand, D&O insurance and socially responsible activities could be complements. If higher CSR scores reduce the probability of a

class-action lawsuit (Boyer & Kordonsky, 2020), then a firm's insurance needs would be reduced and CSR performance would be negatively related to purchasing D&O insurance.

The question is whether better CSR performance increases, decreases, or does not affect the likelihood of a firm purchasing D&O insurance. We believe that there are at least two reasons why CSR performance increases the likelihood of purchasing D&O insurance. First, if managers are sufficiently risk-averse (Lewellen, 2006; Smith & Stulz, 1985), then they will be more inclined to purchase D&O insurance when the cost of insurance is lower, reflecting lower risk. This is due to the advantageous selection phenomenon, which predicts that low-risk customers who are sufficiently risk-averse are more likely to purchase insurance than high-risk customers even at similar costs, as found in some insurance markets (de Meza & Webb, 2001; Einav & Finkelstein, 2011; Fang et al., 2008). Therefore, firms with higher CSR scores could have lower D&O liability risk and still be more likely to purchase D&O insurance. Second, when insurers evaluate a firm as having lower risk of a lawsuit, they will be more willing to provide insurance. This increases the potential supply of D&O insurance to high-CSR firms. Therefore, we present this positive relationship between CSR scores and having D&O insurance as our second testable hypothesis:

Hypothesis 2 (H2): Firms with better CSR performance are more likely to have D&O insurance.

The Moderating Effects of the Risk Environment and Growth Potential

Although CSR may reduce D&O liability risk in general, we do not expect that this effect is monotonic for all firms. In fact, the previous literature demonstrates the non-monotonicity of CSR inputs (Godfrey, 2005; McWilliams & Siegel, 2001) and outcomes related to value creation (Lu, Liu, & Osiyevskyy, 2022; Lu et al., 2021) under different risk contexts. For example, Godfrey (2005) argues that when a firm operates in a high-risk environment (in terms of both idiosyncratic and industry-specific risk), it needs to engage in a higher level of philanthropic activity to meet social expectations. Lu and colleagues (2021) argue that when a firm operates in a high-risk environment, it creates more value by having better CSR performance. We extend this argument to the risk-reduction effects of CSR. The current literature indicates that the main channel through which CSR reduces D&O liability risk is through reputation-building (Barnett et al., 2018; Godfrey, 2005; Godfrey

et al., 2009). A firm with better CSR performance is more likely to be viewed by stakeholders and society as a genuinely good corporate citizen. This leads to a reduction in sanctions by both stakeholders and the government and hence reduces the likelihood of lawsuits against a firm's directors and officers. However, from an instrumental perspective, investors' evaluation of the efficacy of CSR is based on a cost-benefit analysis. When a firm operates in a high-risk environment, the expected marginal benefit of CSR in terms of reducing risk is higher compared with a low-risk situation (Lu et al., 2021). At the limit, a firm that operates in a zero-risk environment would receive zero marginal benefit from high CSR performance, but would still have to bear the cost associated with achieving such CSR performance. As a result, we expect the relationship between CSR and D&O liability risk to be weaker in a low-risk environment. We develop our third hypothesis as follows:

Hypothesis 3 (H3): The relationship between CSR and D&O liability risk is negatively moderated by firms' D&O risk context: firms that operate in a high-risk environment exhibit a stronger negative relationship between CSR and D&O liability risk compared with firms that operate in a low-risk environment.

In addition to the firm's risk environment, opportunities for growth are also expected to moderate the CSR–risk relationship. Recent studies in the risk management and insurance field have shown that high-growth firms face greater litigation risk in general, and greater D&O litigation risk in particular (Du et al., 2020; Huang, 2022; Hwang & Kim, 2018). When a firm faces a security class-action lawsuit, directors and officers could potentially suffer from both financial and reputational losses (Brochet & Srinivasan, 2014; Fich & Shivdasani, 2007; McTier & Wald, 2011), especially when the lawsuits are combined with actions from the government or industry agencies (Helland, 2006). Given the higher litigation risk for high-growth firms. Directors and officers may exhibit more risk-averse behavior (Abdel-Khalik, 2007), resulting in a greater willingness to engage in CSR activities. Furthermore, higher managerial risk aversion can lead to possible underinvestment (Hwang & Kim, 2018)—a sign of agency issues (Jensen, 1986)—that may be penalized by shareholders.

The risk-reduction effect of CSR on D&O liability risk is expected to be stronger for high-growth firms for two reasons. First, investors in high-growth firms have a greater need to control agency conflicts, such as underinvestment issues. Classic literature in finance and risk management has shown that managers of high-growth firms are more likely to use risk management tools, such as hedging and insurance, to avoid underinvestment

problems (Gay & Nam, 1998; Mayers & Smith Jr, 1987). CSR activities can serve as an alternative to other risk management strategies in mitigating agency problems.

Second, high growth can signal managerial capability, which is expected to reduce investors' skepticism about the efficacy of CSR. A possible concern about CSR is that less capable managers are unable to transfer CSR performance into financial returns, thus leading to a non-significant or negative link between CSR and financial outcomes (Lu et al., 2021). If investors in high-growth firms perceive CSR more favorably due to managerial capability, we expect a lower probability and severity of D&O liability lawsuits due to better CSR performance. Hence, we develop our fourth hypothesis as follows:

Hypothesis 4 (H4): The relationship between CSR and D&O liability risk is negatively moderated by firm sales growth; firms with high growth opportunities have a stronger negative relationship between CSR and D&O liability risk compared with firms with low growth opportunities.

Empirical Methods

Data and Sample

We create our sample by combining the Sustainalytics Environmental, Social, and Governance (ESG) database with Compustat and Standard and Poor's (S&P) Capital IQ for key financial variables. The D&O insurance premiums and policy limits were hand-collected from each firm's annual report (available at <http://www.sedar.com>). Our final dataset contains 1,517 firm-year observations, representing a total of 345 unique Canadian companies. For 756 observations (156 firms), we have the D&O insurance coverage and premium; for 361 observations (94 firms), only partial information about D&O insurance is provided; and for 400 observations (95 firms), no information is provided about whether any D&O insurance was purchased. As in Core (1997), Wynn (2008), and Lin and colleagues (2011), we define firms that do not disclose any information about D&O insurance as non-purchasers. Firms that only disclose partial information about D&O insurance are defined as non-disclosers and firms that disclose both the premium and coverage of the D&O insurance are defined as disclosers.

When we combine the number of non-disclosers and disclosers, we find that approximately 74% of publicly traded firms included in the Sustainalytics ESG database have D&O insurance. This level of D&O insurance penetration is consistent with previous research that uses Canadian data (Boyer &

Tennyson, 2015; Lin et al., 2013), suggesting that the Sustainability ESG database is not biased in favor or against firms that have D&O insurance. In the United States over 90% of publicly traded firms have D&O insurance (Willis Towers Watson, 2018), including 95% of Fortune 500 companies (Boubakri & Bouslimi, 2016). In other countries, the same degree of information about D&O insurance is generally not available publicly, with Taiwan (Chen & Li, 2010; Weng et al., 2017), and China (Jia & Tang, 2018) being notable exceptions.

Dependent Variable

Our main dependent variable is the assessment of D&O liability risk as reflected by the D&O insurance RoL. Before discussing the impact of CSR activities on the risk of a D&O lawsuit, we must first show that the insurance RoL is a good measure of D&O liability risk. We also need to compute the frequency and severity of lawsuits against directors and officers, as well as a measure of the perceived litigation risk that insurers are covering.

According to Romano (1991), Gutiérrez (2003), Boyer (2014a), and Boyer and Tennyson (2015), D&O insurance acts as a deep out-of-the-pocket put option for minority shareholders who, in the event of a significant drop in price, have the possibility of suing their representatives on the board for not acting in their best interests (among other possible reasons). For Gutiérrez (2003), in particular, D&O insurance works as a commitment device for efficient shareholder litigation. Hence, we must first determine the risk associated with shareholders suing the firm and its managers, independently of CSR performance.

Assume a simple insurance model (Boyer & Tennyson, 2015), whereby the frequency of lawsuits against directors and officers is given by $f(x)$ and the severity is given by $S(y)$. The insurance premium, Π , is then given by the product of the frequency and the severity, multiplied by a “loading factor” that accounts for expenses unrelated to the loss itself, such as marketing expenses, rent, agent commissions, overhead, and a profit margin:

$$\Pi = E[f(x)S(y)(1 + \gamma)] = (1 + \gamma)E[f(x)S(y)]$$

Assuming that the frequency is independent of the severity, such that $E[f(x)S(y)] = E[f(x)]E[S(y)]$, we can write the expected frequency of a lawsuit as $E[f(x)] = \left(\frac{1}{1 + \gamma}\right) \frac{\Pi}{E[S(y)]}$. Suppose now that the severity

of the insured loss is distributed uniformly over the segment $[0, S_{max}]$ so that

$E[S(y)] = \frac{S_{max}}{2}$. We then have that $E[f(x)] = \left(\frac{2}{1+\gamma}\right) \frac{\Pi}{S_{max}}$. Note that $\frac{\Pi}{S_{max}}$ is the insurance RoL; that is, the ratio of the premium to the maximum

coverage. Following previous literature (Boyer & Stern, 2012; Egger et al., 2015; Lin et al., 2013), RoL is calculated as the premium per US\$1,000 of D&O insurance maximum coverage. The RoL can be interpreted as the underwriter's assessment of the insurance policy's risk: a higher RoL (or unit price) is, thus, associated with a higher D&O litigation risk, *ceteris paribus*.

One possible concern about using this measure is that the price for insurance may be partially determined by the bargaining power of the insured firm, as well as the insured firm's information, making the RoL an imperfect measure of a firm's D&O liability risk. Although this holds true in general, it is unlikely to affect our results because (a) our sample consists only of publicly traded firms with, presumably, similar information and bargaining power; (b) asymmetric information in D&O insurance is not a significant problem (Baker & Griffith, 2007; Boyer, 2014a; Core, 1997); and (c) the D&O insurance market is highly competitive (Core, 1997) so that premiums are close to the break-even points. Moreover, controlling for firm size in the regressions should address variations in D&O insurance premiums caused by differences in bargaining power, to the extent that there are any. Finally, using panel data and controlling for year and firm fixed effects should reduce the impact of any 1 year's supply-side shocks, and any one firm's unobservable ability to systematically secure a good price for its D&O insurance policy.

Independent Variable

We measure the CSR performance of Canadian firms using the *Sustainalytics* database (formerly the *Canadian Social Investment Database*). Sustainalytics is a leading research firm in ESG ratings and social-based stock indices. It assesses the environmental, social, and corporate governance performance of over 4,500 companies across 42 industries worldwide based on over 70 core indicators (Wharton Research Data Services, 2017). Compared with other major third-party CSR databases (e.g., MSCI ESG and Thomas Reuters' ASSET4), Sustainalytics has an advantage in rating Canadian companies. Since it first became available, Sustainalytics' ESG database has been widely used in CSR studies involving Canadian firms (Graafland & Smid, 2019; Surroca & Tribó, 2013; Thorne et al., 2017). Our sample includes all Canadian publicly traded companies rated by Sustainalytics between 2009 and 2017.¹

We use the Sustainalytics ESG historical weighted total score as a measure of firms' CSR performance. Sustainalytics provides the ESG scores based on a variety of key indicators that address different stakeholders, including customers, contractors, suppliers, employees, regulators, and society (Sustainalytics, 2016). The multi-stakeholder-orientated measure avoids running into stakeholder mismatch between the dependent variable and independent variables (Hillman & Keim, 2001) and is, thus, suited for our research question. These stakeholder-specific indicators are categorized into three dimensions, namely the environmental, social, and governance dimensions. Sustainalytics reports a separate score for each of the three dimensions, as well as a weighted total score, on a monthly basis. As we see in Sustainalytics (2016), environmental, social, and governance scores are each evaluated on the basis of three pillars: preparedness (a company's framework to manage material ESG risks), disclosure (the quality of a company's report on ESG issues), and performance (a company's qualitative and quantitative performance). All scores are scaled to range between 0 and 100. The total *ESG score* is a weighted average of the evaluation matrix combining the three pillars over the three dimensions. We use the scores from the latest report before each fiscal year-end. The *CSR Total* score is used as the main explanatory variable of interest for all regression analyses.

Moderating Variables

The current literature provides evidence that D&O liability risk is higher in the U.S. market compared with the Canadian market (Boyer, 2007; Gillan & Panasian, 2015; Hwang & Kim, 2018). This creates a good setting for us to investigate the influence of risk exposure on the relationship between CSR and D&O liability risk. The dummy variable *cross-listing* equals 1 when a firm is cross-listed in the United States and Canada in a given year, and 0 otherwise. To test H4, we operationalize sales growth as the annual growth in total revenue, which is measured as total revenue in the current year minus total revenue in the past year, divided by total revenue in the past year.

Control Variables

Severity and Frequency Control Variables. In line with the approach to insurance pricing described earlier, we must control for the frequency and severity of losses since both affect the price of insurance. The most common example of litigation in the case of D&O insurance is a shareholder lawsuit (Boettrich & Starykh, 2017; Comolli & Starykh, 2014; Heys et al., 2014).² Using the Boyer and Tennyson (2015) assertion that shareholders are the most likely

plaintiffs in D&O lawsuits, we model a lawsuit's expected severity as $E(S) = \rho \times N \times E(\Delta P) = \rho \times NP_0 \times E\left(\frac{\Delta P}{P_0}\right)$, with ρ being the fraction of shareholders that have a reason to sue, NP_0 being the firm's market value of equity (number of outstanding shares, N , multiplied by the price per share, P_0), and $E\left(\frac{\Delta P}{P_0}\right)$ representing the expected abnormal stock return resulting from alleged managerial misconduct. In our econometric model, ρ is operationalized as *Share Turnover* as a proportion of total outstanding common shares, NP_0 is the firm's *Market Value of Equity*, and $E\left(\frac{\Delta P}{P_0}\right)$ is the normalized difference between the highest and the lowest stock price in the year. Because all three measures should be positively related to D&O insurance coverage and premium, the impact on RoL is ambiguous.

The probability of a lawsuit occurring depends on the likelihood of the share price dropping significantly, which affects the likelihood of a lawsuit, and on the riskiness of the firm's business environment. We measure the share price risk as the average between the annualized daily stock price volatility (if the stock has been trading for at least a year) and the stock's implied volatility at year-end. When this average cannot be calculated because one measure does not exist, we simply use the one that is available. To control for the business environment, we identify whether the firm's shares are listed on a U.S. stock market in addition to the TSX (Clarkson & Simunic, 1994; Core, 1997). As evident in Boettrich and Starykh (2017) and Heys and colleagues (2020), the simple fact of being listed on a U.S. stock market increases the frequency of lawsuits, but not necessarily the severity, a feature that is reflected in D&O insurance contracts (Boyer, 2014b). As a result, *Volatility* and *Cross-listing* should be positively related to litigation risk and D&O insurance RoL.

Other Control Variables. We control for firm characteristics that have been identified in previous research as being related to CSR performance and D&O insurance premiums and coverage, and that interact with ESG scores and affect other firm processes (Hillman & Keim, 2001; Hull & Rothenberg, 2008; Jayachandran et al., 2013). One such variable is a firm's cost of capital, as measured by the firm's weighted average cost of capital (*WACC*). A firm's cost of capital is calculated as $WACC = \frac{MVE}{MVE + LTD} R_e + \frac{LTD}{MVE + LTD} R_d$, where *MVE* is the firm's market value of equity, *LTD* is the firm's total

long-term debt, R_e is the expected return of the equity according to a CAPM estimation (using the 1-year beta from S&P Capital IQ), and R_d is calculated as total interest payment divided by total long-term debt. Because a higher WACC means higher systematic risk, we expect the firm's WACC to be positively related to litigation risk and thus to the RoL. Our reasoning is that firms with high systematic risk are more likely to face greater stock price drops during those periods when investors are looking for scapegoats; that is, when the economy is doing poorly.

We also include as controls firm size (using the market value of equity, *MVE*), leverage, book-to-market ratio, profitability, and intangible investments. A firm's *leverage* is calculated as total debt divided by total assets (Hull & Rothenberg, 2008; Lin et al., 2011, 2013). The *book-to-market ratio* is calculated as the book price of a share of common stock divided by its market price. *Profitability* is calculated as the *return on assets (ROA)*, operationalized as net income divided by total assets. Finally, a firm's intangible investment is approximated by using a firm's research and development intensity (*R&D intensity*), calculated as R&D expenditures divided by total sales. All are commonly included as controls in the CSR and the D&O insurance literature.

We include *boardsize*, calculated as the number of members on the board of directors, and *Independence*, calculated as the proportion of independent members on the board, to control for board composition in the logistic regressions on the decisions to purchase D&O insurance. Board composition should affect the decision to purchase D&O insurance, but not in the RoL specifications. We do not include the size of the board, gender and racial composition of the board, or any measure of board independence in the RoL specifications, because ESG scores generally include indicators such as board size, board independence and diversity, so that including both board composition and the ESG score would bias our analysis.

Results

Summary Statistics and the Choice to be Insured

Table 1 shows the descriptive statistics (mean and standard deviation) and the Pearson correlation coefficients for the independent variables used in our analysis. No correlation is greater than 0.7, suggesting that the data do not exhibit collinearity. We also tested the variance inflation factors (VIF) of all independent variables and found that no VIF is >2.5 , suggesting that the data do not suffer multicollinearity issues.³

Table 1. Descriptive Statistics: Mean, Standard Deviation, and Pearson Bivariate Correlations of Explanatory Variables.

Variables	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. CSR total	56.26	8.30														
2. Cross-listing	0.35	0.48	0.24													
3. Sales growth	0.14	0.77	-0.07	-0.01												
4. Market value of equity	7.85	14.77	0.34	0.32	-0.02											
5. Stock price range	0.70	1.21	-0.04	0.04	-0.04	-0.14										
6. Share turnover	0.98	1.22	-0.01	0.19	0.04	-0.05	0.20									
7. Stock volatility	35.87	17.60	-0.06	0.05	0.04	-0.28	0.55	0.39								
8. Lawsuit amount	4.18	20.31	0.01	0.17	0.01	0.16	0.13	0.61	0.14							
9. WACC	0.07	0.04	0.01	0.11	0.03	-0.05	0.16	0.18	0.47	0.03						
10. Book-to-market	0.74	1.14	0.03	0.00	-0.03	-0.10	0.07	0.05	0.26	-0.01	0.02					
11. Leverage	0.24	0.17	-0.02	-0.09	-0.02	-0.11	0.08	-0.07	-0.11	0.01	-0.31	-0.10				
12. R&D intensity	0.01	0.04	-0.06	0.13	-0.02	-0.05	0.02	0.17	0.08	0.09	0.03	-0.04	-0.10			
13. ROA	0.60	0.63	0.00	-0.19	-0.05	-0.14	-0.07	-0.09	-0.13	-0.04	-0.13	-0.14	0.04	-0.01		
14. Board size	9.79	2.95	0.29	0.12	-0.08	0.50	-0.17	-0.11	-0.33	0.07	-0.21	-0.07	-0.05	-0.10	0.04	
15. Independence	0.79	0.12	0.24	0.15	-0.08	0.18	-0.03	0.13	-0.10	0.06	0.00	-0.03	-0.03	0.02	-0.10	0.12

Note. N = 1517. Two-tailed t-tests of Pearson's correlation coefficients are estimated. CSR = corporate social responsibility; WACC = weighted average cost of capital; ROA = return on assets.

Correlations greater than |0.051| (respectively |0.061|, |0.081|) are significant at $p \leq 0.05$ (respectively $p \leq 0.01$, $p \leq 0.001$) level.

Table 2. Descriptive Statistics: Non-Purchasers Versus Purchased and Disclosed.

Variables	Not purchased (1) N = 400				Purchased and disclosed (2) N = 756				Difference in mean: (1)-(2) N = 1,156		
	M	SD	Min	Max	M	SD	Min	Max	Mean difference	t stat.	P value
D&O coverage (in 100 million)			N/A		1.05	0.87	0.10	6.50			N/A
D&O premium (in 100K)					6.08	6.28	0.24	43.00			
D&O RoL					5.69	3.22	0.88	21.44			
CSR total	53.93	7.51	38.00	78.00	56.96	8.65	37.92	81.34	-3.026***	-5.914	.000
Environmental score	47.83	9.60	31.00	85.00	52.22	11.75	28.00	85.71	-4.383***	-6.412	.000
Social score	53.97	9.15	30.00	78.00	55.72	9.94	26.00	86.44	-1.753***	-2.931	.002
Governance score	62.95	10.09	37.00	92.00	65.94	10.27	41.91	92.00	-2.982***	-4.723	.000
Cross-listing	0.25	0.43	0.00	1.00	0.36	0.48	0.00	1.00	-0.110***	-3.819	.000
Sales growth	0.21	1.25	-0.76	19.63	0.12	0.50	-0.89	10.53	0.099**	1.899	.029
Market value of equity	5.61	9.45	0.01	83.33	9.87	18.26	0.00	146.52	-4.257***	-4.363	.000
Stock price range	0.82	0.99	0.10	8.33	0.68	1.42	0.10	26.97	0.139**	1.751	.040
Share turnover	0.93	0.88	0.01	8.01	1.00	1.30	0.00	15.81	-0.064	-0.881	.189
Stock volatility	39.37	18.14	9.38	127.18	35.35	18.26	7.76	126.22	4.018***	3.568	.000
Lawsuit amount	1.78	3.50	0.01	42.78	5.27	17.56	0.00	296.95	-3.498***	-3.942	.000
WACC	0.08	0.04	0.00	0.27	0.07	0.04	-0.02	0.47	0.013***	5.911	.000
Book-to-market	0.82	0.78	-0.81	8.86	0.73	1.42	-24.06	14.38	0.088	1.152	.125
Leverage	0.23	0.16	0.00	0.72	0.23	0.17	0.00	1.09	0.004	0.372	.355
R&D intensity	0.00	0.01	0.00	0.10	0.01	0.04	0.00	0.44	-0.007***	-3.432	.000
ROA	0.50	0.59	0.00	5.16	0.62	0.62	0.02	3.29	-0.115***	-3.042	.001
Board size	9.05	3.34	3.00	20.00	10.39	2.92	5.00	20.00	-1.343***	-7.076	.000
Independence	0.76	0.12	0.46	1.00	0.79	0.12	0.43	1.00	-0.034***	-4.553	.000

Note. The "Difference test" is a t-test with H0: mean(Not Purchased Group) = mean (Purchased & Disclosed Group). N = 1,156, of which the number of observations for Purchased & Disclosed Group is 756, and the number of observations for Not Purchased Group is 400. CSR = corporate social responsibility; WACC = weighted average cost of capital; ROA = return on assets.

*Indicates $p \leq 0.1$. **Indicates $p \leq 0.05$. ***Indicates $p \leq 0.01$.

The first three lines of Table 2 show the summary statistics for D&O insurance premium, coverage, and RoL for those firms that fully disclosed their D&O insurance information (756 observations from 156 firms). Coverage is presented in US\$100,000,000, premium in US\$100,000, and the RoL as the premium divided by US\$1,000 of coverage (that is, line 2 divided by line 1).

The average coverage is just over US\$100 million, whereas the average premium is US\$608,000. The average (respectively median) RoL is US\$5.69 (respectively US\$4.90) per US\$1,000 of coverage, with the 25th percentile firm paying US\$3.17 per US\$1,000 of coverage and the 75th percentile firm paying US\$7.74. RoL is, therefore, slightly skewed as shown in Figure 1, which plots the histogram of the density function of the RoL.

The remainder of Table 2 compares full-disclosure firms with firms that do not report D&O insurance purchases. The *t*-tests of the difference in means show significant differences between the two groups for most variables, especially with respect to the CSR scores. Non-purchasers receive significantly lower CSR scores (at the 1% level of significance) than full-disclosure firms on all three ESG dimensions. Full-disclosure firms are also larger, have lower stock price volatility, have lower WACCs, spend more on R&D, have larger and more independent boards, have higher ROAs, are also more likely to be cross-listed on a U.S. stock market, and have lower growth. The two subsamples are not statistically different with respect to leverage, book-to-market ratio, and stock turnover.

Table 3 presents the multivariate analysis that links CSR scores with the decision to purchase D&O insurance and to disclose D&O insurance information. Firms that have better CSR scores are more likely to purchase D&O insurance, even after controlling for a multitude of factors, whether they disclose the contract parameters or not. The marginal effect of CSR performance on the probability of purchasing D&O insurance is such that, based on the regression results in Model 1, the probability of purchasing D&O insurance increases by 5.81% per 1 SD increase in CSR performance (8.30). Also as expected, Model 2 of Table 3 shows that CSR performance does not significantly affect whether a firm discloses D&O insurance information. Results in Table 3, thus, provide support for H2.

CSR Performance and the Insurance RoL

Our interpretation of the positive relationship between a firm's CSR score and its purchase of D&O insurance is that suppliers of D&O insurance assess firms with better ESG performance more favorably, as these firms and their managers are perceived to have a lower likelihood of being sued. An

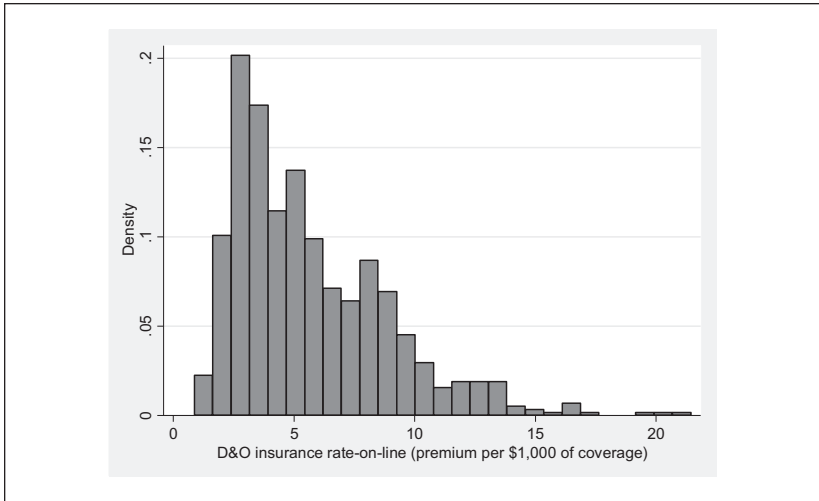


Figure 1. Histogram of the Directors' and Officers' Insurance Rate on Line Density Function.

alternative explanation is that firms with better ESG performance could be managed by more risk-averse individuals, making it more likely that they purchase D&O insurance.

The two possible explanations for the positive relationship between a firm having insurance and its CSR score can be differentiated by looking at the impact of CSR performance on the D&O insurance coverage and premium. If firms with better CSR scores pay less per unit of D&O insurance coverage, this implies that insurers perceive firms with higher CSR scores as having a lower risk of a lawsuit against their directors and officers. Under the competing “managerial risk aversion” story, more risk-averse managers should be willing to pay more, in the Arrow-Pratt (Arrow, 1965; Pratt, 1964) sense, for the same level of D&O insurance protection so that we should see a positive relationship between CSR scores and D&O insurance RoL.

We report in Table 4 two-way fixed-effect (firm and year) regression results using all of the firms that report their D&O insurance coverage and premiums (756 observations). In all four models presented in Table 4, a firm's total CSR score is associated with lower RoL, with point estimates ranging from $\beta = -0.053$ to $\beta = -0.059$, depending on the specification. These results suggest that firms that have higher CSR scores pay significantly less per dollar of D&O insurance coverage than firms with lower CSR scores. The

Table 3. Probit Regressions of Probability of Directors' and Officers' Insurance on Corporate Social Responsibility.

Variables	Model 1		Model 2		Model 3	
	Purchasers vs non-purchasers	P value	Disclosers vs non-disclosers	P value	Disclosers vs non-purchasers	P value
	Coefficient (SE)		Coefficient (SE)		Coefficient (SE)	
CSR total	0.022(0.006)***	.000	-0.004(0.006)	.529	0.021(0.006)***	.001
Firm size	0.009(0.036)	.811	0.123(0.038)***	.001	0.027(0.038)	.480
Leverage	-0.110(0.239)	.645	-0.677(0.260)***	.009	-0.217(0.263)	.408
Book-to-market	-0.016(0.028)	.575	0.013(0.042)	.768	-0.008(0.032)	.793
R&D intensity	9.005(1.978)***	.000	1.879(1.084)*	.083	8.553(1.774)***	.000
Cross-listing	0.298(0.085)***	.000	-0.446(0.096)***	.000	0.223(0.094)**	.017
WACC	-5.165(1.327)***	.000	-1.077(1.387)	.437	-5.622(1.603)***	.000
ROA	0.230(0.073)***	.002	-0.128(0.074)*	.084	0.196(0.081)**	.016
Independence	1.254(0.324)***	.000	-0.931(0.391)**	.017	0.868(0.350)**	.013
Board size	0.028(0.019)	.141	0.056(0.022)***	.009	0.039(0.020)**	.047
Year fixed-effects		Yes		Yes		Yes
Constant	-1.701(0.414)***	.000	1.130(0.490)**	.021	-1.581(0.439)***	.000
Wald Chi ²	139.89(18)***		134.01(18)***		124.92(18)***	
Pseudo R ²	.094		.097		.095	
Observations/firms	1,517		1,117		1,156	

Note. We estimate the probit regressions between D&O insurance purchasers (disclosers) dummy and total CSR score using year fixed effects (not reported). Robust standard errors are reported in parenthesis. Model 1 contains all observations. Model 2 contains full discloser firms (756) and non-discloser firms (361). Model 3 contains full discloser firms and non-purchaser firms (400). The dependent variable for Model 1 is the D&O insurance purchase dummy, which equals 1 if a firm purchased D&O insurance and 0 if it did not. The dependent variable for Model 2 and 3 is the D&O insurance discloser dummy, which equals 1 if a firm disclosed full information about D&O insurance, and 0 if it did not. CSR = corporate social responsibility; WACC = weighted average cost of capital; ROA = return on assets.

*Indicates $p \leq 0.1$. **Indicates $p \leq 0.05$. ***Indicates $p \leq 0.01$.

Table 4. Firm and Year-Fixed Effect Regressions of Directors' and Officers' Insurance on Corporate Social Responsibility.

Variables	Model 1 DV = RoL		Model 2 DV = RoL		Model 3 DV = RoL		Model 4 DV = RoL	
	Coefficient (SE)	P value	Coefficient (SE)	P value	Coefficient (SE)	P value	Coefficient (SE)	P value
Main								
Market value of equity	-0.053(0.025)**	.034	-0.059(0.026)**	.023	-0.055(0.025)**	.030	-0.058(0.026)**	.025
Stock price range	0.022(0.017)	.209			0.025(0.018)	.164		
Share turnover	0.106(0.061)*	.084			0.063(0.044)	.152		
Lawsuit amount	-0.040(0.078)	.608			0.003(0.074)	.962		
Control variables								
WACC			-0.005(0.002)**	.018			-0.003(0.003)	.375
Book-to-market					-3.186(2.518)	.208	-3.203(2.419)	.187
Leverage					-0.135(0.044)**	.003	-0.154(0.052)**	.003
R&D Intensity					0.965(0.840)	.252	0.740(0.849)	.385
ROA					4.234(3.770)	.263	1.347(3.079)	.662
Stock volatility	0.022(0.012)*	.064			-0.222(0.530)	.676	-0.152(0.505)	.764
Cross-listing	3.626(0.576)**	.000	0.025(0.009)**	.006	0.027(0.012)**	.026	0.028(0.010)**	.003
Constant	7.923(1.133)**	.000	3.620(0.579)**	.000	3.680(0.602)**	.000	3.665(0.603)**	.000
Year fixed effects	Yes		7.993(2.089)**	.000	7.905(1.162)**	.000	8.296(1.315)**	.000
Firm fixed effects	Yes		Yes		Yes		Yes	
F(df1, df2)	10.33(14, 155)**		10.13(12, 155)**		8.74(19, 155)**		7.81(17, 155)**	
Pseudo R ² -within	0.316		0.306		0.335		0.325	
Observations/firms	756/156		756/156		756/156		756/156	

Note: We estimate CSR's impact on the rate-on-line (RoL) of D&O insurance using firm and year fixed effect models. Robust standard errors are reported in parenthesis. The dependent variable is rate-on-line (RoL), measured as the premium per US\$1,000 of coverage. CSR Total is a firm's last reported CSR total score before fiscal year-end. CSR = corporate social responsibility; WACC = weighted average cost of capital; ROA = return on assets.

*Indicates $p \leq 0.1$. **Indicates $p \leq 0.05$. ***Indicates $p \leq 0.01$.

regressions of Models 1 and 3 control for the three severity (*Share Turnover, MVE, Price Range*) and the two frequency (*Volatility, Cross-listed*) components of the expected loss, whereas Models 2 and 4 control for the combined severity measure (*Lawsuit Amount*) and the two frequency measures (*Volatility, Cross-listing*). The F-statistics of model fit are all significant at the 0.1% level.

Evidence that firms with better CSR performance pay less per dollar of D&O insurance coverage suggests that the risk-aversion explanation can be discarded. In addition, none of our variables (including CSR score) explain the maximum coverage or the deductible (results not shown). This further suggests that risk aversion is an unlikely explanation for purchasing D&O insurance in the first place.

In all regression models reported in Table 4, we find that D&O insurance RoL is significantly lower for firms with better CSR performance. In terms of the economic significance of our results, a firm that increases its CSR score by a single point (given the average CSR Total score of 56.96, this is an increase of 1.75%) would see a reduction in its premium per US\$1,000 of D&O insurance coverage of US\$0.058 (using the estimate from Model 4), which represents approximately 1.02% of the average RoL of US\$5.69 per US\$1,000 of coverage. The D&O insurance premium elasticity with respect to CSR score is thus approximately 0.6. Another way to see the economic significance is to posit that a firm could increase its CSR score by one standard deviation (8.65) and decrease its D&O insurance premium. Assuming a maximum coverage of US\$100 million, this would reduce the premium by US\$50,170, to a level that is about 8.25% below the mean D&O insurance premium of US\$608,000. We thus conclude that we find evidence supporting H1.

The Moderating Effect of Risk Context

Results in Table 4 show that controlling for whether the firm is cross-listed is important, as is evident when we plot, in Figure 2, the density function of the predicted RoL from the regression leading to Model 3. The “camel-like” density function shows that firms listed on a Canadian stock market only (first hump, mostly) are paying on average US\$4.21 per US\$1,000 of D&O insurance coverage compared with firms that are cross-listed on the U.S. stock market (second hump, mostly), which are paying on average US\$8.06 per US\$1,000 of coverage. The significant difference in D&O insurance RoL between the cross-listed and non-cross-listed firms calls for an investigation of the moderating effect of the firm’s risk environment on the CSR-D&O risk relationship.

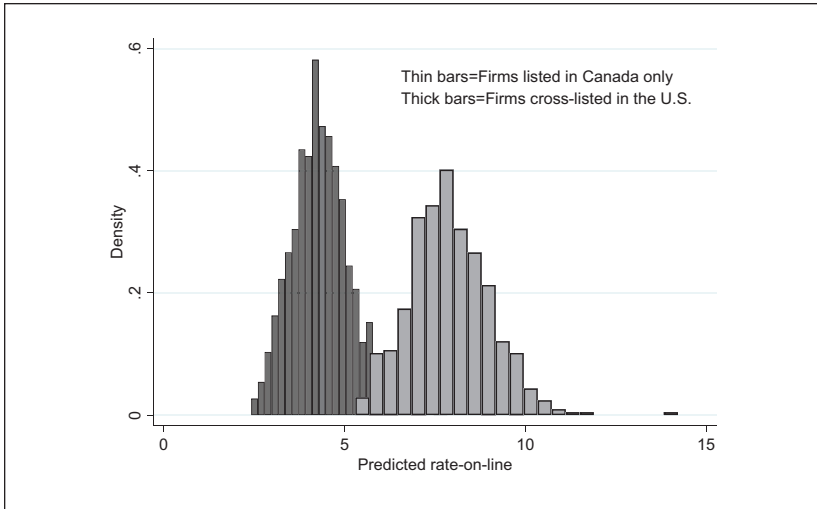


Figure 2. Histogram of the Predicted Directors' and Officers' Insurance Rate-on-Line Density Function for Firms Listed on A Stock Market in Canada Only, and for Firms Listed on A Stock Market in the United States and Canada.

We report the regressions including the interaction between CSR performance and cross-listing in Table 5. The results in all model specifications show a significantly negative moderating effect of the cross-listing dummy, indicating a strengthening of the negative relationship between CSR performance and D&O RoL for cross-listed firms. We further plot the moderating effect at different levels of CSR performance, as shown in Figure 3. The figure shows that for firms that are cross-listed in the U.S., better CSR performance leads to a significant reduction in D&O insurance RoL. These results provide support for H3.

The Moderating Effect of Sales Growth

H4 predicts that the negative CSR-D&O risk relationship is stronger for high-growth firms because high-growth firms are more likely to be sued (Abdel-Khalik, 2007; Hwang & Kim, 2018). Having good CSR performance helps mitigate D&O risk for high-growth firms, thereby reducing underinvestment problems. We test this hypothesis and report the results in Table 6. The results show that the interaction term between CSR and sales growth is significant and negative for all regression models, indicating that the negative relationship between CSR and D&O liability risk is strengthened by sales growth.

Table 5. The Moderating Effect of Directors' and Officers' Risk Context.

Variables	Model A1 DV= RoL		Model A2 DV= RoL		Model A3 DV= RoL		Model A4 DV= RoL	
	Coefficient (SE)	P value	Coefficient (SE)	P value	Coefficient (SE)	P value	Coefficient (SE)	P value
Main								
CSR total	-0.008 (0.017)	.636	-0.015 (0.018)	.422	-0.006 (0.017)	.741	-0.012 (0.018)	.519
Cross-listing	8.260 (2.072)***	.000	8.326 (2.024)***	.000	8.911 (2.090)***	.000	8.643 (2.014)***	.000
CSR × Cross-listing	-0.088 (0.038)**	.021	-0.089 (0.037)**	.018	-0.100 (0.038)***	.009	-0.095 (0.037)**	.011
Market value of equity	0.024 (0.019)	.196			0.028 (0.019)	.134		
Stock price range	0.106 (0.059)*	.076			0.063 (0.043)	.141		
Share turnover	-0.050 (0.083)	.549			0.009 (0.074)	.898		
Lawsuit amount			-0.007 (0.002)***	.000			-0.005 (0.003)	.114
WACC					-3.478 (2.430)	.154	-3.456 (2.286)	.133
Control variables					-0.135 (0.039)***	.001	-0.155 (0.047)***	.001
Book-to-market					1.184 (0.811)	.147	0.897 (0.815)	.273
Leverage					6.852 (4.627)	.141	2.684 (3.236)	.408
R&D intensity					-0.184 (0.540)	.734	-0.096 (0.506)	.849
ROA					0.027 (0.012)**	.025	0.029 (0.010)***	.003
Stock volatility	0.022 (0.012)*	.063	0.025 (0.009)***	.006	5.243 (0.827)***	.000	5.855 (0.870)***	.000
Constant	5.614 (0.841)***	.000	6.053 (0.873)***	.000				
Year fixed effects	Yes		Yes		Yes		Yes	
Firm fixed effects	Yes		Yes		Yes		Yes	
F(df1, df2)	14.08 (15,155)***		13.59 (13,155)***		11.56 (20,155)***		10.60 (18,155)***	
Pseudo R ² -within	.332		.321		.354		.343	
Observations/firms	756/156		756/156		756/156		756/156	

Note: We estimate CSR's impact on the rate-on-line (RoL) of D&O insurance using firm and year fixed effect models. Robust standard errors are reported in parenthesis. The dependent variable is rate-on-line (RoL), measured as the premium per US\$1,000 of coverage. CSR Total is a firm's last reported CSR total score before fiscal year-end. CSR = corporate social responsibility; WACC = weighted average cost of capital; ROA = return on assets.

*Indicates $p \leq 0.1$. **Indicates $p \leq 0.05$. ***Indicates $p \leq 0.01$.

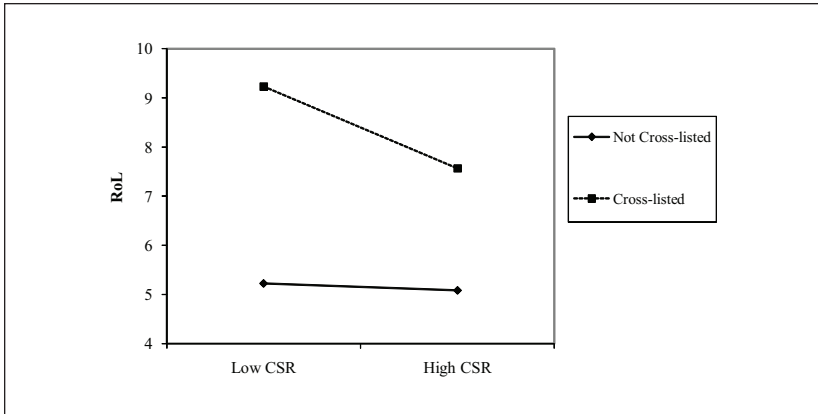


Figure 3. Moderating Effect of Cross-listing on the Corporate Social Responsibility—Directors’ and Officers’ Rate on Line Relationship.

We plot the moderating effect of sales growth in Figure 4. The figure shows that although both low- and high-growth firms have a negative relationship between CSR and D&O insurance RoL, the slope for the high-growth firms is much steeper than that for the low-growth firms, indicating a stronger negative impact of CSR on D&O insurance RoL. Therefore, H4 is supported.

Identification, Endogeneity, and Selection Bias

Two-Stage Least Squares Regression. The main goal of our article is to estimate whether a firm’s CSR performance affects the unit price of D&O insurance. Although we use firm fixed-effect regressions as our primary regression method, it is possible that a firm’s CSR performance is endogenously determined, leading to an unreliable estimate of the coefficient. Therefore, an identification strategy is required to control for endogeneity. We rely on a two-stage least squares (2SLS) instrumental variable (IV) approach to address potential endogeneity problems. Following Cheng and colleagues (2014), Harjoto and Jo (2015), and Jiraporn and colleagues (2014), we use the industry’s average CSR score as the instrument for a firm’s CSR score. The industry-average CSR score is calculated based on the SIC three-digit industry classification.

The 2SLS IV regression results are shown in Table 7. The industry-average CSR score is a significant predictor of an individual firm’s CSR score for both Models A1 and B1, thus confirming that the industry average CSR score

Table 6. The Moderating Effect of Sales Growth.

Variables	Model A1 DV= RoL		Model A2 DV= RoL		Model A3 DV= RoL		Model A4 DV= RoL	
	Coefficient (SE)	P value	Coefficient (SE)	P value	Coefficient (SE)	P value	Coefficient (SE)	P value
Main								
CSR total	-0.049 (0.025)**	.048	-0.055 (0.026)**	.031	-0.051 (0.025)**	.043	-0.054 (0.026)**	.035
Sales growth	1.896 (0.521)***	.000	1.403 (0.506)***	.006	1.784 (0.523)***	.001	1.446 (0.510)***	.005
CSR * Sales Growth	-0.036 (0.011)***	.002	-0.026 (0.011)**	.023	-0.035 (0.011)***	.003	-0.027 (0.011)**	.016
Mkt value of equity	0.025 (0.018)	.160			0.03 (0.02)	.137		
Stock price range	0.112 (0.059)*	.058			0.06 (0.05)	.181		
Share turnover	-0.035 (0.075)	.642			0.00 (0.07)	.989		
Control variables								
WACC			-0.004 (0.002)**	.049			-0.003 (0.003)	.462
Book-to-market					-2.93 (2.59)	.261	-2.924 (2.474)	.239
Leverage					-0.15 (0.05)***	.001	-0.173 (0.050)***	.001
R&D intensity					0.69 (0.86)	.420	0.449 (0.871)	.607
ROA					3.14 (3.84)	.415	0.828 (3.191)	.796
Other f(x)					-0.25 (0.52)	.628	-0.200 (0.502)	.691
Stock volatility	0.022 (0.012)*	.059	0.025 (0.009)***	.006	0.03 (0.01)**	.025	0.028 (0.010)***	.003
Cross-listing	3.636 (0.594)***	.000	3.626 (0.595)***	.000	3.71 (0.62)***	.000	3.695 (0.618)***	.000
Constant	7.645 (1.128)***	.000	8.095 (1.295)***	.000	7.72 (1.17)***	.000	8.158 (1.320)***	.000
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F(df1, df2)	15.56 (16,154)***		14.50 (14,154)***		12.28 (21,154)***		11.65 (19,154)***	
Pseudo R ² -within	.323		.311		.341		.331	
Observations/firms	752/155		752/155		752/155		752/155	

Note. We estimate CSR's impact on the rate-on-line (RoL) of D&O insurance using firm and year fixed effect models. Robust standard errors are reported in parenthesis. The dependent variable is rate-on-line (RoL), measured as the premium per US\$1,000 of coverage. CSR Total is a firm's last reported CSR total score before fiscal year-end. CSR = corporate social responsibility; WACC = weighted average cost of capital; ROA = return on assets.

*Indicates $p \leq 0.1$. **Indicates $p \leq 0.05$. ***Indicates $p \leq 0.01$.

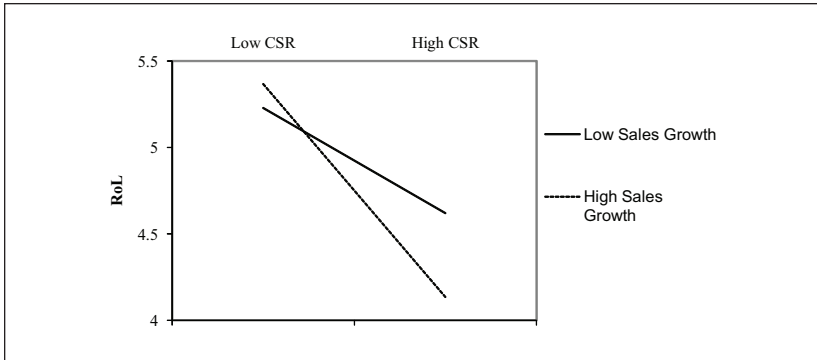


Figure 4. Moderating Effect of Sales Growth on the Corporate Social Responsibility—Directors' and Officers' Rate on Line Relationship.

is a strong instrument in this setting. The Kleibergen and Paap (2006) Rank Lagrange multiplier (LM) Statistics for models A1 and B1 are 116.71 and 117.68, respectively, and are both significant at the $p < .001$ level. The Cragg and Donald (1993, 1997) Wald F statistics are 425.63 and 428.90 for Models A1 and B1, with a 10% Stock and Yogo (2002) critical value of 16.38 at the 10% level. Therefore, we believe that the instrumental variable does not suffer from under-identification or weak-identification issues.

The second-stage regressions (Models A2 and B2) show that a firm's fitted CSR score based on its industry's average CSR score significantly predicts its D&O insurance RoL. The point estimate is almost twice the amount reported in Table 4. The results in Table 7 suggest that the relationship between *CSR Total* score and D&O insurance *RoL* is robust after treating for endogeneity, thus providing further support for H1.

Selection Bias. Another concern about the empirical design is potential bias that arises from analyzing only the liability risk of firms that choose to disclose D&O insurance. One may argue that firms that disclose the basic characteristics of their D&O insurance contracts are systematically different from firms that do not purchase D&O insurance or from firms that do not disclose fully the information about their D&O insurance, leading to biased estimations of the relationship between CSR and D&O insurance. We use the Heckman two-stage regressions to address this issue (Boyer & Stern, 2012; Core, 1997; Egger et al., 2015; Gillan & Panasian, 2015). Table 8 presents regression results that control for possible selection bias between the *full disclosers* and the *non-purchaser* firms.⁴

Table 7. Endogeneity Control With Two-Stage Least Squares Instrumental Variable (IV) Regression.

Variables	Model A1: 1st stage DV = CSR Total		Model A2: 2nd stage DV = RoL		Model B1: 1st stage DV = CSR Total		Model B2: 2nd ^d stage DV = RoL	
	Coefficient (SE)	P value	Coefficient (SE)	P value	Coefficient (SE)	P value	Coefficient (SE)	P value
Inst.	0.777 (0.043)***	.000			0.777 (0.042)***	.000		
Main			-0.105 (0.034)***	.002			-0.101 (0.034)***	.003
Measures of S(y)			0.020 (0.012)*	.097	-0.002 (0.019)	.899	0.024 (0.012)*	.056
Mkt value of equity	-0.339 (0.130)***	.009	0.089 (0.099)	.372	-0.318 (0.136)**	.019	0.049 (0.055)	.376
Stock price range	-0.847 (0.233)***	.000	-0.073 (0.068)	.284	-0.650 (0.233)***	.005	-0.018 (0.079)	.818
Share turnover					-6.439 (5.816)	.269	-3.884 (2.184)*	.075
WACC					-0.002 (0.085)	.982	-0.131 (0.047)***	.005
Control variables					1.005 (1.434)	.484	0.962 (0.851)	.258
Book-to-market					25.629 (12.666)**	.043	5.258 (3.588)	.143
Leverage					-1.017 (0.720)	.159	-0.250 (0.387)	.518
R&D intensity					0.036 (0.016)**	.023	0.029 (0.010)***	.003
ROA	0.033 (0.014)**	.023	0.024 (0.010)**	.013	2.685 (1.586)*	.091	3.697 (0.656)***	.000
Stock volatility	2.356 (1.629)	.148	3.621 (0.618)***	.000	16.716 (2.918)***	.000	13.096 (1.879)***	.000
Cross-listing	17.368 (2.922)***	.000	13.716 (1.864)***	.000				
Constant	Yes		Yes		Yes		Yes	
Year fixed effects	Yes		Yes		Yes		Yes	
Firm fixed effects	Yes		Yes		Yes		Yes	
F statistics	158.62***		367.22***		1,148.62***		1,238.68***	
Kleibergen-Paap rank LM statistics	116.71***				117.68***			
Observations/firms	756/156		756/156		756/156		756/156	

Note. We estimate CSR's impact on D&O insurance *rate-on-line* (RoL) using instrumental variable regression. Robust standard errors are reported in parenthesis. For the first stage of the IV regression, the instrumental variable is the *industry mean CSR*, measured as the annual industry mean of CSR total score. The independent variable in the second-stage IV regression is the predicted value of CSR total score from the first-stage IV regression. CSR = corporate social responsibility; WACC = weighted average cost of capital; ROA = return on assets.

*Indicates $p \leq 0.1$. **Indicates $p \leq 0.05$. ***Indicates $p \leq 0.01$.

In line with the Heckman approach, we use *board size* and *independence* as selection instruments for the first-stage probit regression. Since D&O insurance covers all board members and top management team members, a larger board generally represents a higher likelihood that any one member of the board will demand that the firm purchase D&O insurance and disclose its characteristics. This likelihood is even greater when there are more independent board members. With board size having little to do with CSR scores,⁵ the use of this variable in the first-stage regression is valid.

The second-stage regression results are reported in the second stage models 1–3 in Table 8, which use the same specifications as Models 1, 3, and 4 from Table 4, respectively, but with an added Inverse-Mills Ratio variable controlling for selection bias. The regression results indicate that a slight selection bias exists (at the 10% level), at least with respect to Models 1 and 2. This bias does not affect the point estimate or the general level of significance of the main variable of interest, *CSR Total*, for which the point estimate remains approximately at $\beta \approx -0.055$, as it was in Table 4. We can therefore conclude that even if selection bias is marginally statistically significant, it does not affect the main results.

Bootstrapped Standard Errors. Another possible concern regarding the results is the limited sample size. Although the use of robust standard errors corrects for some of the heteroscedasticity, the limited sample size of $N = 756$ may raise generalizability concerns. We address this possible concern by bootstrapping the standard errors 1,000 times and reporting the pooled coefficients and standard errors. Table 9 uses the same model specifications as Table 4 but corrects the estimates using bootstrapped standard errors rather than robust standard errors. As shown, the results are not significantly different from those reported above, indicating that our results do not suffer sample generalizability issues.

Discussion and Conclusion

This article investigates how CSR affects a firm's directors' and officers' liability risk as measured by the price paid for D&O liability insurance. Numerous studies have examined how CSR affects a firm's aggregate risk, but very few have examined how CSR affects the specific risks of a firm. Our article helps to fill this gap by using the price paid per US\$1,000 of D&O insurance coverage (the RoL) as a proxy for D&O liability risk. Our results show that firms with good CSR performance are charged lower D&O liability insurance RoL, indicating that insurers assess them as having lower liability risk. Our results are robust after controlling for endogeneity between CSR

Table 8. Heckman Two-Stage Regressions to Treat Selection Biases.

Variables	First stage DV = D&O Dummy		Second stage model 1 DV = RoL		Second stage model 2 DV = RoL		Second stage model 3 DV = RoL	
	Coefficient (SE)	P value	Coefficient (SE)	P value	Coefficient (SE)	P value	Coefficient (SE)	P value
Main Measures of S(y)								
CSR total			-0.054 (0.024)**	.028	-0.053 (0.025)**	.038	-0.056 (0.026)**	.033
Mkt value of equity			0.024 (0.017)	.156	0.026 (0.017)	.125		
Stock price range			0.095 (0.062)	.124	0.059 (0.042)	.161		
Share turnover			-0.040 (0.077)	.610	-0.002 (0.074)	.980		
Lawsuit amount								
WACC		.000			2.308 (4.323)	.594	-0.002 (0.003)	.597
Book-to-market		.906			-0.136 (0.046)**	.004	1.480 (4.355)	.734
Leverage		.480			1.156 (0.835)	.168	-0.155 (0.053)**	.004
R&D intensity		.791 (1.668)**			2.311 (3.505)	.511	0.898 (0.864)	.300
ROA		.012			-0.351 (0.535)	.513	0.326 (3.701)	.930
Board size		.000					-0.273 (0.512)	.595
Board independence		.001						
Stock volatility		.001		0.024 (0.012)**	0.044	0.027 (0.012)**	0.028 (0.010)**	.004
Cross-listing		.001		3.377 (0.580)**	.000	3.189 (0.693)**	3.248 (0.708)**	.000
Inverse mills ratio		.035		-1.207 (0.663)*	.070	-1.960 (1.211)	-1.647 (1.285)	.202
Constant				8.559 (1.106)**	.000	8.656 (1.157)**	8.924 (1.244)**	.000
Year fixed effect	Yes		Yes		Yes		Yes	
Firm fixed effect	N/A		Yes		N/A		Yes	
Wald Chi ²			114.04 (16)**		N/A		N/A	
F(df1, df2)			N/A		10.54 (15, 155)**		8.88 (20, 155)**	7.45 (18, 155)**
Total observations		1,156		756		756		756

Note. We control for selection bias using Heckman two-stage regressions. The model contains firms from the discloser group (756) and firms from the non-purchaser group (400). Robust standard errors are reported in parenthesis. The first-stage regressions are probit regressions; the second-stage regressions are firm and year fixed-effect regressions that include the *inverse Mills ratio* calculated from the first stage as a measure of selection bias. The dependent variable for the first-stage Heckman regressions in all panels is the D&O dummy, which equals one if a firm purchased D&O insurance, and 0 otherwise. The dependent variable for the second-stage regressions is *Rare-on-line (RoL)*, measured as the premium per US\$1,000 of coverage. CSR = corporate social responsibility; WACC = weighted average cost of capital; ROA = return on assets. *Indicates $p \leq 0.1$. **Indicates $p \leq 0.05$. ***Indicates $p \leq 0.01$.

Table 9. Bootstrapped Results.

Variables	Model 1 DV= RoL		Model 2 DV= RoL		Model 3 DV= RoL		Model 4 DV= RoL	
	Coefficient (SE)	P value	Coefficient (SE)	P value	Coefficient (SE)	P value	Coefficient (SE)	P value
Main								
Measures of S(y)								
CSR total	-0.053 (0.025)**	.033	-0.059 (0.026)**	.022	-0.055 (0.026)**	.032	-0.058 (0.026)**	.025
Mkt value of equity	0.022 (0.020)	.281			0.025 (0.021)	.239		
Stock price range	0.106 (0.138)	.445			0.063 (0.118)	.593		
Share turnover	-0.040 (0.119)	.738			0.003 (0.114)	.976		
Control variables								
Lawsuit amount			-0.005 (0.009)	.596				
WACC								
Book-to-market					-3.186 (2.582)	.217		
Leverage					-0.135 (0.073)*	.064		
R&D intensity					0.965 (0.899)	.283		
ROA					4.234 (9.707)	.663		
Other f(x)					-0.222 (0.549)	.686		
Stock volatility	0.022 (0.012)*	.070	0.025 (0.009)***	.006	0.027 (0.012)**	.030	0.028 (0.010)***	.004
Cross-listing	3.626 (0.675)***	.000	3.620 (0.662)***	.000	3.680 (0.748)***	.000	3.665 (0.725)***	.000
Constant	7.923 (1.131)***	.000	8.310 (1.289)***	.000	7.905 (1.192)***	.000	8.296 (1.335)***	.000
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wald Chi ² (df)	122.55 (14)***		117.82 (12)***		119.68 (19)***		120.18 (17)***	
Observations/firms	756/156		756/156		756/156		756/156	

Note. In this table, we bootstrapped the standard errors of the firm and year fixed effect regressions 1,000 times. The dependent variable is Rate-on-line (RoL), measured as the premium per US\$1,000 of coverage. Bootstrapped standard errors are reported in parentheses. CSR = corporate social responsibility; WACC = weighted average cost of capital; ROA = return on assets.

*Indicates $p \leq 0.1$. **Indicates $p \leq 0.05$. ***Indicates $p \leq 0.01$.

investment and RoL and potential selection biases. Hence, our results offer further evidence that better CSR performance functions as a risk management tool that reduces the overall risk of a firm, in line with previous studies (Flammer & Luo, 2017; Godfrey et al., 2009; Kytte & Ruggie, 2005).

We make three contributions in terms of linking CSR with D&O liability risk. First, by using the D&O insurance rate-on-line as an *ex ante* estimate of liability risk and by linking CSR performance to D&O insurance prices, we provide insight into why it is rational to allocate resources to CSR activities despite investor skepticism. Using the D&O liability insurance RoL as a proxy for D&O liability risk helps measure the risk as an integrated *ex-ante* prediction of both frequency and severity of losses, thus providing insight regarding the true relationship between CSR and D&O liability risk.

Second, in addition to being among the first to explore the relationship between CSR and specific business risks, our article contributes to the D&O insurance literature by investigating CSR strategy as a determinant of D&O insurance purchasing behavior and cost. The previous literature in D&O insurance mainly focused on how firm characteristics, such as firm size, board characteristics, change in shareholders, debt, and risks, influence D&O insurance premiums (Boyer & Tennyson, 2015; Chen & Chang, 2011; Egger et al., 2015). We extend this research by showing that firms' CSR strategies also influence the demand for D&O insurance. This has important implications for insurance companies that need to make underwriting decisions based on available information.

Third, our article contributes to the literature that considers how investors perceive CSR activities by investigating the contingencies of the CSR–risk relationship. Extant research focuses primarily on establishing the overall relationship between CSR and risk, and implies a monotonic impact of CSR on risk. However, research has shown that the financial efficacy of CSR is contingent on different firm-specific and industry-specific factors (Godfrey, 2005; Petrenko et al., 2016; Ramchander et al., 2012), leading to the rejection of the monotonicity assumption. Our results show that firms that operate in a high-risk environment or that have high growth opportunities have a stronger negative relationship between CSR and D&O liability risk. We, thus, extend the current literature by investigating the divergent impact of CSR on D&O liability risk under different risk contexts and growth potentials.

Our research extends our understanding of the mechanism through which CSR performance reduces firm risk in two ways. First, by showing a path through which internal risk management capabilities affect risk, our research provides support for Lu, Liu, and Falkenberg (2022)'s argument, whereby CSR not only influences firm risk by building stakeholder trust but also builds internal risk management capabilities that lead to better risk

identification and treatment. Knowing that insurance companies consider a firm's risk management capabilities when evaluating its riskiness, it follows that firms with better risk management processes will pay lower premiums, which leads to a lower cost of risk transfer for high-CSR firms. By showing that CSR leads to reductions in D&O liability insurance premiums (i.e., a lower cost of risk transfer), we provide the missing piece to the puzzle.

Second, we test two hypotheses regarding investor skepticism toward CSR. The *risk exposure hypothesis* proposes that since CSR functions as a costly risk management mechanism, investors' concerns may arise from an unfavorable cost-benefit ratio for investment decisions in a low-risk environment (Lu et al., 2021). According to the *agency problem hypothesis*, CSR is often used as a tool for managers to acquire personal benefits rather than benefiting shareholders. Therefore, better CSR performance may signal more severe agency issues and be penalized by investors (Masulis & Reza, 2015).

Our results show that the risk-reduction effect of CSR is more significant when a firm operates in a high-risk environment (i.e., when a Canadian firm is cross-listed in the U.S. market), thus supporting the risk exposure hypothesis: the risk-reduction mechanism of CSR is valuable for firms that have high exposure to risk (Lu et al., 2021; Sharfman & Fernando, 2008). In addition, we also show that high CSR performance leads to lower D&O insurance RoL for high-growth firms compared with their low-growth rivals, indicating lower D&O liability risk.

The limitations of this analysis provide opportunities for future research. First, we use Canadian publicly listed firms for our empirical analysis because there is access to firms' D&O insurance contracts and CSR scores are available. However, there could be concerns regarding the generalizability of the results for any other country's specific context. Future studies that investigate the CSR-D&O risk relationship in different settings can test the validity of our findings. Second, the benefit of using the D&O insurance premium to proxy for D&O liability risk is that it considers liability risk as an integral measurement of both the frequency and severity of risk. However, a potential limitation is that it limits our ability to investigate CSR's impact on the frequency and severity of loss separately. Further research can explore methods to measure the frequency and severity of loss simultaneously but separately. Third, this research explores CSR's impact on a specific type of liability risk, namely D&O liability risk, which represents the potential risk to a firm's directors and officers. Future research can make fruitful contributions to the current literature by investigating the impact of CSR on other types of liability risk representing the interests of other stakeholders, such as product liability (customers) and workplace liability (employees). Finally, we relied on the Sustainalytics database for CSR scores. Our choice was justified by the fact

that Sustainalytics covers more Canadian companies over a longer period than other databases, such as the MSCI ESG data (formerly KLD) and Thomson Reuter's ASSET4. Future studies could investigate alternative ESG or CSR measures.

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Notes

1. Based on our conversation with the company's staff, Sustainalytics went through a major change in rating methodology in 2009. Therefore, data prior to 2009 are no longer available.
2. Although D&O liability insurance covers more than security class-action lawsuits, these are the most common and costly lawsuits against firm directors and officers (see the different Towers-Watson surveys).
3. VIFs are not reported due to space limitations.
4. We also tested the Heckman two-stage regression by treating possible selection bias between *D&O insurance purchasers* (full disclosers and non-full disclosers) and the *non-purchasers*. Results are similar to what we reported.
5. Interested readers can refer to Dalton and colleagues (1999) for a summary of research supporting positive, negative, as well as non-significant results between board size and firm outcomes.

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