

1. Introduction

There are still a lot of unanswered questions as to what motivates an international company to list its shares on a non-domestic stock market, let alone an American stock market. Whatever the motivations of the international company it seems that investors have determined that this cross-listing is beneficial for the company's worth. Examining what happens to the domestic stock market returns of international companies from 35 countries that decided to be willing participants in "American Depositary Receipts" from 1985 to 1995 (that is, shares traded on an American stock exchange that mirror an international firm's domestic stocks), Miller (1999) came to the conclusion that there was on average an abnormal and statistically significant increase of 1.15% in the stock's price following the announcement that the international firm was to cross-list in the United States.

If one focuses exclusively on the domestic market's reaction to the cross-listing announcement, it seems clear that listing one's shares of common stock on an American exchange has positive net effects, whatever the reason. It is with respect to the channels through which value is created by cross-listing one's shares that debate rages amongst financial economists and real financial world actors. Indeed, researchers and other financial market participants don't agree on what could be the greater benefits for investors of cross-listing.

In this paper, we will focus on the cost of cross-listing, which has been generally hidden in past research or included in the overall market reaction to cross-listing. In particular, we examine the increase in the cost of the directors' and officers' liability insurance premium following cross-listing into the United States.

According to Bancel and Mittoo (2004), the financial advantages of cross-listing, such as the firm's increased visibility among foreign investors and international financial institutions, largely outweigh the cost. Liquidity also increases, which Amihud and Mendelson (1986) argue is good for the company's stock value. Foerster and Karolyi (1998) find that Canadian companies cross-listing in the United States between 1981 and 1990 and show an average increase of 29% in the volume

of daily exchanges on the domestic market and an average decrease of the bid-ask spread of approximately 44 basis points following cross-listing. Finally, a third type of argument is that shareholders benefit from better corporate governance, but that seems to be a very secondary concern of CEOs according to the Bancel and Mittoo (2004) survey. Even if improved corporate governance does not seem to be a major cross-listing motivator, it can be very beneficial from the point of view of the firm's shareholders (see Doidge 2003 and Doidge *et al.* 2004), although the governance benefits for Canadian firms seems a bit more unlikely.

Although the concept of corporate governance is more qualitative than liquidity and access to better financing conditions, the general concept of corporate governance has attracted much interest in the past decade. The question is how to define a better corporate governance. Arguably the best type of measure would be the one where parties have a financial vested interest in the way corporate governance is measured. Of all the possible measures (see Gompers *et al.* 2003, Romano 2006, Rose 2007, Bebchuk *et al.* 2009, Bebchuk and Hamadi 2009, Adams *et al.* 2010, Bebchuk *et al.* 2013, Larcker and Tayan 2013 and Boyer 2013), the only one that originates from actual transactions – rather than a checklist of characteristics that have been hypothesized to be associated with problematic corporate governance features – is the information embedded in the firms' directors' and officers' liability insurance contract (*D&O insurance* from now on).¹ Succinctly, a D&O liability insurance contract is purchased by the company, to protect the financial wealth of its directors and officers in the event that a lawsuit is brought against them based on

¹ Although over 95% of American firms purchase such a contract, the details of the D&O liability insurance contracts are not available in the United States – or for most countries for that matter. When studying D&O insurance, most researchers have relied on using Canadian companies (see Core 1997 & 2000, Boyer 2005, Park Wynn 2008, Lin *et al.* 2011, Gillan and Panasian 2014, *inter alia*). This means that the best one can do in terms of examining the link between corporate governance, firm value and D&O insurance in the United States is to look at Canadian companies that are also listed on a stock market in the United States; it is only for those companies where the information related to D&O insurance is reliably disclosed in their management proxies. Griffith (2006), Baker and Griffith (2007a and 2007b) and Gupta and Prakash (2012) have recommended that more information on a firm's D&O insurance protection and price for that protection be shared with investors. The results in Boyer and Stern (2014) which link D&O insurance characteristics with firm returns in the first year post-IPO is the most direct evidence of the value to investors of such information.

their involvement with the firm.

Baker and Griffith (2007a) argue that D&O insurance underwriters have developed an unbiased expertise² that allows them to measure the risk of litigation against the firm, its directors and its managers. This measure is revealed in the insurance premium that firms pay to protect their managers. Because most lawsuits (and the most expensive lawsuits) against a firm's managers originate from the shareholders as the result of an accounting event (see the different Towers-Watson surveys), one can use the protection that firm managers are obtaining to shield themselves against the financial repercussions of "corporate governance accidents" as a governance indicator. In essence, we related the risk of litigation against a firm's managers to a governance risk.

As we will see, Canadian firms that cross-list their shares of common stock on a market in the United States do not purchase more D&O insurance coverage in the year after cross-listing than in the year before. The difference we find, however, is related to the fact that D&O insurance premium paid is much higher after cross-listing. We also find an increase in the price per unit of coverage (a statistic known as the Rate-on-line in the insurance industry) as the firm decides to cross-list on an American stock market. The increase is not trivial. Controlling for other factors, we find that the premium roughly doubles following cross-listing into the United States.

Any variation in coverage, premium or rate-on-line is not likely the result of any change in fundamental factors related to the cross-listing companies' operational and/or financial risk. This means that when companies are listing their shares on an American stock market they are exposing themselves to higher litigation risk that is reflected in the frequency of the lawsuits, but not in their severity. This suggests that firms operating in the United States face a more litigious environment. There is therefore a well-defined and measurable cost associated with cross-listing

² We say that the underwriters' expertise is unbiased because of market competition amongst underwriters. If the premium is systematically too low, not enough money will have been accumulated in the event of a claim, whereas if the premium is systematically too high, the insurer would not have any business.

that has not been documented before.

Our results have far reaching implications for corporate governance since they suggest that D&O insurers adjust the basic structure of insurance contracts to reflect the higher risk of litigation associated with being listed in the United States. This result implies that D&O insurers should also be able to measure the firm's litigation risk independently of where shares are traded. The evidence we find in support of the D&O insurers' ability to assess the litigation risk against a firm and its management team – what Baker and Griffith (2007a) call the firm's risk culture and the character of its managers – provides more ammunition to the idea presented in Griffith (2006), Baker and Griffith (2007b & 2008), Gupta and Prakash (2012), and Boyer and Stern (2012 & 2014) that more D&O liability insurance information should be made public because it represents a non-biased measure of what one could call the firm's governance risk.

The present paper is divided as follows. Section 2 presents a literature review on corporate governance, on the value of cross-listing, and on D&O liability insurance. Section 3 describes the sample and the methodology used in the different tests. Section 4 presents the analysis of the test results. Finally, section 5 concludes the research.

2. A Review of Cross-listing, Governance, and D&O Insurance

2.1. Corporate governance, litigation risk, and cross-listing

Many researchers have studied the disciplinary aspect of cross-listing. In particular, Stulz (1999) suggested the *Bonding hypothesis* whereby in a context of financial market globalization one of the few phenomena that imply a reduction in a firm's cost of capital is the one that is associated with an increased surveillance of the managers. In a principal-agent context, surveillance is a necessary action initiated by non-controlling shareholders to ensure that decisions taken by managers are for the betterment of shareholders and not for theirs only. Even though the Canadian financial market is mature in terms of investor protection, and its legal environment is mostly governed by common law principles, the Canadian legal system does not provide the same level of protection to small shareholders as the legal system in place in the United States.

The bonding hypothesis rests upon the superiority of the governance system in the United States, which raises the question of corporate governance quality measurement.³ The quest for a proper measure of corporate governance risk (possibly starting with the G-index of Gompers *et al.* 2003 and the E-index of Bebchuk *et al.* 2009) has given rise to an entire academic literature (see the survey of Bebchuk and Hamadi 2009), and even to a new industry (see Rose 2007).

What governance measures matter? Lately Bebchuk *et al.* (2013) have found disappearing support for the popular G-index and E-index (see also Larcker and Tayan 2013). It seems that investors have started incorporating corporate governance measure in their portfolio choices⁴ so that we no longer find a link between corporate governance quality and stock market returns (see also Core *et al.* 2006 and Cremers *et al.* 2009 for an alternate explanation). Morck (2005) writes:

“Erroneous governance metrics (and indeed, a reliance on one-size-fits-all governance checklists) not only affect important shareholder decisions and decisions on whether to invest in or divest from a particular company, but may also have a more general, harmful effect on corporate governance regulation” (p. 891).

The new governance advising industry (Rose 2007) promotes the use of governance indices that guide investors through the forest of possible governance measures. As a whole, the governance industry does not seem to use private information; each industry participant, however, uses its own recipe of inputs to come up with a number that supposedly reflects the quality of the firm’s governance practices. Akin to credit agencies that do not share any direct financial burden of providing an erroneous credit quality rating, commercial indices promoters do not have much to lose directly in the event of a suboptimal index construction or recommendation.

³ Morck (2005) provides a thorough survey of the history of corporate governance around the world from which one has to wonder if one system (i.e., the common law system in place in most countries of English tradition such as the United States, the United Kingdom, Canada, India, and Australia) is really better than the others. Even the notion of corporate governance quality is murky and goes beyond the protection of so-called widow-and-orphan shareholders (see Morck and Steier 2005).

⁴ Or because of an association between governance and a common risk factor that has not been captured by the four-factor model.

2.2. D&O liability insurance

In contrast to commercial governance indices that are often a checklist of characteristics that have been hypothesized to be associated with problematic corporate governance features, measures based on D&O insurance originate from actual transactions. For instance, the D&O insurance *rate-on-line* (i.e., the premium-to-coverage ratio) gives us the lowest price that an insurer is willing to accept to protect a firm's directors and officers against the cost associated with lawsuits.

Because insurers conduct a thorough audit of what Baker and Griffith (2007a) call the firm's "deep governance" features (i.e. it's the firm's *culture* and the *character* of the management team), they have had to develop an optimal technology that transforms a firm's observable and audited characteristics into a D&O liability insurance premium. And because they are directly financially responsible for paying the claims as well as for defense costs, insurers have the appropriate incentives to correctly measure the expected cost of litigation against the insured firm's directors and officers; if an insurer was to systematically over-charge for the risk it assumes then it would lose business, whereas if it was to systematically under-charge for the risk, it would not accumulate enough reserves to pay for the losses and thus go out-of-business. The structure of a D&O insurance contract should therefore be seen as an unbiased measure of a firm's governance risk.

Starting with Core (1997), it has been common to link D&O liability insurance with litigation risk and firm governance. Core (2000) finds that there are only two types of variables that explain the D&O insurance premium: business risk and governance risk. These results argue in favor of using D&O insurance as an indicator of litigation and governance risk. For Griffith (2006), D&O liability insurance is seen as an instrument which allows the surveillance of directors since the insurers must correctly assess the risk associated with the company's governance to remain in business. In Boyer and Stern (2012), D&O insurance is also linked to governance as riskier corporate structure are found to pay higher D&O insurance rate-on-line. D&O insurers also have the potential of being efficient corporate monitors (see Holderness 1990, and O'Sullivan 1997).

The information embedded in D&O insurance has also been linked to more than just governance risk and has had a real measurable impact in the corporate world. It seems that more generous D&O insurance protection has been linked to more aggressive bids during mergers and acquisitions (Lin *et al.* 2011), to lower underpricing at the time of an IPO (Chalmers *et al.* 2002), to lower returns in the first year post-IPO (Boyer and Stern, 2014), to lower Tobin-Q (Chen and Li 2010), to more aggressive earnings management (Chung and Park-Wynn 2008, Cao and Narayanamoorthy 2011 and Boyer and Tennyson 2014), and to higher cost of equity (Chen *et al.* 2012). On the positive side, D&O insurance is associated with a lower risk of bankruptcy (Zou and Adams 2008), and lower managerial risk aversion (Hwang and Kim, 2013).

3. Hypothesis Development, Data, and Econometric Methodology

The current section of the paper is devoted to the development of the testable hypothesis, to the description of the sample and variable construction, and to the econometric approach we will use. It is important to keep in mind the relatively small number of observations (at most, there will be 98 firms in our sample, which gives us only 196 potential observations) to which we have access when developing the hypotheses and the econometric approach.

There is ample evidence that the legal system in the United States is more litigious than Canada's. Heys *et al.* (2014) and Comolli and Starykh (2014) present the number of new security class actions in Canada and in the United States from 1997 to 2013.⁵ There were on average 4 new class action lawsuits filed in Canada for the years 1997-2006 compared to over 200 in the United States. Heys *et al.* (2014) report that of the 48 class action lawsuits that were filed in the United States against Canadian companies between 1997 and 2005, only 8 had a parallel Canadian filing. It therefore seems that lawsuits are more likely to occur in the U.S. than in Canada. In terms of severity, however, the story is quite different. For the same period, the median settlement in Canada was 12.7 million Canadian dollars whereas approximately half of the settlements in the U.S. were

⁵ Although D&O liability insurance covers more than security class actions lawsuits, these are the most common and costly lawsuits against firm directors and officers according to the different Towers-Watson surveys.

worth less than 8 million American dollars.

With respect to the premium paid, the question is whether firms must pay more in D&O insurance premium when they cross-list their shares of common stock in the United States, and if so how much more. Given that the frequency of lawsuits is much larger in the U.S. than in Canada, but the size of the settlements are approximately the same, we should see premiums increasing faster than coverage. This suggests that the D&O liability insurance premium should increase faster than coverage.

The four testable hypotheses (with the alternate) follow:

- H1: Firms are no more likely to purchase D&O insurance after cross-listing in the United States; H1A: Firms are more likely.
- H2: Firms do not increase their D&O insurance policy limit after cross-listing in the United States; H2A: Firms increase their policy limit.
- H3: Firms do not have to pay more for their D&O insurance after cross-listing in the United States; H3A: Firms pay more for their insurance.
- H4: Firms do not have to pay more per unit of D&O insurance coverage after cross-listing in the United States; H4A: Firms pay more per unit of coverage.

As insurers have the ability to measure the litigation risk associated with cross-listing into the United States, one should presume that they should be able to correctly grasp the firm's very own litigation risk independent of where the shares are traded. And if that is the case, then perhaps D&O insurers have developed a technology that allows them to properly price the risk of lawsuits against managers, which is one manifestation of corporate governance. In other words, it is quite possible that the D&O insurance contract parameters can be used as a market-based indicator of a firm's governance risk.

3.1. Sample description

Our sample is limited to Canadian-listed firms that decided to cross-list in the United States since it is the norm for Canadian-listed firms to report the basic information (coverage and premium)

about the D&O liability insurance contract they offer to their directors and officers. The initial sample included 131 Canadian-listed companies that cross-listed their shares of common stock in the United States between 1987 and 2006. Because of missing financial statements (mostly prior to 1996) only 98 firms remain in the final sample.

Because we are interested in how D&O insurance premiums and coverage changes as a company decides to cross-list, we need financial statements and managerial proxy and information circular before and after cross-listing. For each cross-listing event we use information in the year prior to cross-listing and information in the year after the cross-listing year, thus deleting the year of the cross-listing itself.⁶ Our final sample therefore contains two observations per cross-listed firm.

The accounting data was primarily gathered from the Compustat's database, and completed using Bloomberg's financial data platform when the information was missing in Compustat. The data pertaining to the structure of the board of directors, including its size, the independence of its directors, the dual CEO and chairman of the board roles as well as the presence of a majority stockholder, was gathered by hand using the firm's managerial proxy and information circular available for those years in www.sedar.com. The D&O liability insurance information also comes from those circular from which we assume that firms which provide no information about D&O insurance are deemed to have no insurance. Table 1 presents the sample distribution by year.

INSERT TABLE 1 HERE

For companies that declared having D&O insurance in their financial statements, we collected the premium they paid and the coverage they obtained for each firm-year. The statistics on premiums, coverage, and the ratio of premium to 1000\$ of coverage are shown in the last two columns of Table 1. We can see that an upward trend in the average premium of D&O insurance contracts and a hump-shape trend in the coverage. More interestingly, we observe an important break in the premium-to-coverage ratio between 2001 and 2002, which corresponds to the bursting of the

⁶ For example, for a cross-listing that took place during the 2001 financial year, we use data from financial year 2000 (prior to cross-listing) and financial year 2002 (posterior to cross-listing).

dotcom bubble. It thus appears to be important to account for year effects in the regressions.

3.2. Variable definition and construction

We now present the different variables that we will use in the analysis, starting with the dependent variables and moving on to the control variables with their hypothesized impact on the dependent variable.

3.2.1. Dependent variables

There are essentially four dependent variables in the analysis. First, we will determine whether a firm has purchased D&O insurance or not. This binary variable (called *Purchase*) takes the value 1 if the firm has purchased insurance and zero otherwise. We will identify a firm as a purchaser of D&O insurance based on the firm's report of having insurance in their annual management proxy. If there is no mention of insurance in the proxy, we will suppose that the firm does not have insurance (same as in Park-Wynn 2008 and others).

We will also be using the total premium paid (*Premium*) in thousands of dollars, as well as the D&O liability insurance policy limit (*Coverage*) in millions of dollars, which is the maximum amount an insurer will pay in the event of a claim or in a year. We will also use the log transformation of these two variables which will then be named *Ln_Premium* and *Ln_Coverage* respectively.

The last dependent variable we construct is known as the rate-on-line in the insurance industry; it is essentially the ratio of the premium paid to 1000\$ dollars of coverage (as defined by the policy limit). In other words, given our construction of *Premium* and *Coverage*, we have the following relationship $Rate-on-line = Premium / Coverage$. We will also be using the log transformation of *Rate-on-line* so that $Ln_ROL = Ln_Premium - Ln_Coverage$.

The average values of these variables by year were presented in Table 1 already. We saw that approximately 53% of firms reported having D&O insurance before or after they cross-listed into the United States (47% before cross-listing and 60% after). This proportion is much less than in the United States where over 95% of public firms report have D&O insurance (see the different

Towers-Watson reports on D&O insurance in the United States) to protect the firm and its managers against lawsuits. It is even less than the percentage of Canadian firms that report having purchased D&O insurance in the different Towers-Watson reports or in previous work on Canadian data (see for instance Boyer and Tennyson 2014) which hovers at around 75%.

3.2.2. Main independent variable

The independent variable of interest is *Crosslisting*. This binary variable has a value of 1 if the company's shares of common stock are traded in the United States and 0 if the company's stock is listed on the Toronto stock exchange only. *Crosslisting* is equal to zero in the year prior to cross-listing and to one in the year posterior. The cross-listing year is omitted.

If cross-listing in the United States increases litigation risk, then we should expect to see *Crosslisting* having a positive and significant impact on *Coverage* and *Premium*. The impact on the *Rate-on-line* is not obvious though since the increase in premium following cross-listing may not be as large (or may be larger) than the increase in coverage. If the United States represent a more litigious environment, and that a more litigious environment creates greater compliance costs for the corporation, we should then expect to find an increase in the firm's D&O insurance *Rate-on-line* following cross-listing. If that is the case, then we will be able to conclude that the increase in litigation risk that a firm is exposed to when cross-listing in the United States comes not only as a result of much larger lawsuits (because of the greater reliance of class action and derivative lawsuits – see McTier and Wald 2011) but also because of more frequent lawsuits.

3.2.3. Control variables

3.2.3.1 Financial variables

The set of financial control variables grasp the importance of financial risk factors in determining the amount of D&O insurance a firm purchases. Of particular importance are firm size, profitability, and debt financing.

MVE represents for the company's stock market capitalization (and *ln_MVE* its log transformation

to reduce the impact of potential outliers). A larger company is more at risk of being sued by an angry shareholder if only because there are more of them. Also D&O insurance claims are often related to the amount of wealth shareholders lost because of a managerial mishap (see Boyer and Tennyson 2014 for such a model) or as a very deep out-of-the-money put option for shareholders.⁷ In both cases larger corporations should require more insurance so that we should see a positive correlation between *Ln_MVE* and both *Coverage* and *Premium*. A counter argument is that large companies are more likely to have in-house lawyers for their defense and potential lawsuits, therefore substituting their need for D&O insurance, especially for smaller claims. The net impact on *Rate-on-line* is therefore not clearly identifiable. *Ln_Assets* represents the log of the firm's book value of assets, another proxy for size.

GrowthOpp represents the ratio of the firm's quasi-market value of assets (market value of equity plus book value of debt) to the firm's book value of assets. It captures the companies' growth opportunities. We hypothesize that a company that has important growth opportunities faces greater litigation risk because of the greater likelihood of missing its growth goals. We therefore expect *GrowthOpp* to be positively related to *Coverage* and to *Premium*, and probably to *Rate-on-line* as well as more intangible and frivolous lawsuits should be expected because of the nature of the variable. *MB-ratio* is the ratio of the firm's market value of equity to its book value of equity; it should have the same impact as *GrowthOpp*.

DebtRatio is calculated as the ratio of the firm's book value of total liabilities to the book value of assets. All else equal, a higher leverage leads to higher financial distress risks and puts in peril future payment of dividends, causing a higher litigation risk. Higher debt can also provide some sort of discipline to firm managers who must make regular payments to the firm creditors, thus reducing the possibility of funds expropriation. This means that directors and officers of more levered firms will be less likely to invest in risky projects that would endanger the company's ability to meet its fixed financial obligations. On the other hand, creditors are more likely to oversee the managers' actions if they have more to lose, thus reducing the need for monitoring on the part of

⁷ This is true even if the median ratio of settlement-to-investor losses is about 3% according to Comolli and Starykh (2014). See also Boyer (2003, 2013).

the D&O insurers. Because of the conflicting effects, we cannot clearly hypothesize what impact *DebtRatio* will have on coverage.

The *ROA* variable represents the firm's return on assets asset (net income divided by the book value of assets). A high ROA could indicate that a company is performing well and is therefore less likely to be sued, or it could indicate aggressive earnings management, which would increase the firm's chance of being sued in the future. This second possibility is especially likely given that firms in our sample have decided to cross-list into the United States, which is possibly a good reason to make a firm's financial situation look better than it really is (see Park Wynn 2008, and Cao and Narayanamoothy 2011). The net effect is therefore uncertain.

3.2.3.2 Governance variables

The next set of control variables we present includes the company's governance measures. As previously discussed, this data was hand-collected.

Independence is calculated as the percentage of directors on the board that are deemed to be independent. We expect that a higher proportion of independent directors should decrease the risk of litigation. Moreover, D&O insurers should feel that their monitoring role is less important when supervision is done by a more independent board, if an independent board is indeed related positively to good governance and lower litigation risk. It therefore seems natural to expect that a more generous insurance protection is necessary in order to attract more competent independent directors. We should then expect a positive relationship between *Independence* and *Coverage*.

Duality is a binary variable equal to 1 if the roles of CEO and Chairman are held by the same person and 0 otherwise. A CEO who is also chairman is usually associated with more power in the hands of the executive arm of a corporation, which is generally associated with weaker governance practices. We therefore expect *Duality* to have a positive impact on *Premium*.

Board_size represents the number of members sitting on the board of directors. The greater the

number of members on the board, the greater should be the demand for D&O insurance since more members could require defense attorneys. We should therefore see a positive link between *Board_size* and both *Coverage* and *Premium*. The impact on *Rate-on-line* is ambiguous, however.

Blockholder is a binary variable equal to 1 if one of the company's shareholders owns at least 10% of the stock. Coffee (1999, 2002) argues that a company with a concentrated ownership will have a tendency to avoid listing its stock in a jurisdiction where minority investors are better protected, so as to not dilute the influence of the majority shareholder. The reason is that the minority shareholders may feel more powerful to engage in litigation with the majority shareholder in a jurisdiction where their rights are more important. Therefore, the presence of a *Blockholder* could be seen as a greater litigation risk. On the other hand, the presence of a *Blockholder* reduces the need for the D&O insurer to monitor as closely the behaviour of the management team. The impact of *Blockholder* on *Coverage* should be positive, and it is ambiguous with respect to *Premium* and *Rate-on-line*.

3.2.3.3 Other variables

Riskiness is a binary variable equal to 1 if the company operates in a risky industry and 0 otherwise. We are using the Bajaj *et al.* (2000) methodology, which identifies the ten industries with the most lawsuits, in addition to those identified in Comolli and Starykh (2014).⁸ We use the SIC codes to identify the industry in which the companies operate. Firms that operate in riskier industries should have to pay higher premiums, and their managers should require more protection.

3.3. Summary statistics

Before getting into the econometric methodology, it is worthwhile to linger over the descriptive statistics of the sample used for the current research and to try and make out the trends. Looking

⁸ Our data includes firms from only four of the ten industries identified in Bajaj *et al.* (2000): biotech, telecommunication, media, and financial services. In Comolli and Starykh (2014), the top-three litigation-prone industries are electronics, health, and finance.

at the full sample statistics of Table 3,⁹ we note that the *ln_MVE* variable has an average value of 6.01 (median of 5.87). This corresponds to an average stock market capitalization of \$400M. Although we do not list it in Table 3, the sample is heavily skewed since the average firm value is \$1,877M although the median is \$354M. 95% of the firms have a market value between \$39M and \$8,319M. We see why the log transformation is potentially important. *GrowthOpp* is also skewed (mean of 3.82 and median of 2.30), but not as much as the market value of equity.

On average the sample firms' *ROA* is negative. This is due to the fact that over half of the firms in our sample have negative net income, perhaps because of the presence of many growing small to medium size enterprises. On the capital structure side, the average sample firm has a *DebtRatio* of 0.34, which means 34% of the firms' book value is in the form of debt.

With respect to governance-related variables, we see that there are between 7 and 8 members on our sample firms' board, approximately 70% of which are independent. We note the presence of a *Blockholder* in a little over than half the cases.

Finally, the D&O insurance variables tell us that the average D&O liability insurance premium paid was close to \$300,000 for an average coverage of 38 million Canadian dollars. The average *Rate-on-line* is \$11.69 per thousand dollars, which is greater than the median *Rate-on-line*. Only 54% of observations are associated with a firm which purchased D&O insurance.

3.4. Econometric approaches and methodology

We use four econometric and/or statistical approaches in our study of D&O insurance around cross-listing: 1- A comparison of means and medians; 2- OLS & probit regressions; 3- A Heckman's (1979) two-step approach to control for the potential bias between purchasers and non-purchasers of insurance; and 4- A simultaneous equation regression to account for the possible

⁹ Obviously the average of the *Crosslisting* variable is 0.5 since the complete firm-year sample is composed of the same companies before and after cross-listing in the United States.

endogenous aspects of *Premium* and *Coverage*.

The first two approaches are standard and need no explanation. Note that we will be using robust standard errors throughout unless otherwise specified.

The two-step approach is necessary to account for the potential selection bias that could affect our regressions' coefficients. The problem stems from the fact that not all of the companies in our sample subscribe to D&O insurance so that they may not be randomly selected into the insured and the non-insured samples. Indeed, in the first step of the Heckman (1979) approach, we isolate the decision to purchase a D&O insurance policy. We then examine in a second step the impact of the control variables on D&O insurance premium and coverage. The selection bias correction is done using the inverse Mills ratio.

Finally, it is reasonable to think that coverage and premium are determined simultaneously through negotiation between the insured and the insurer. We will therefore control for this simultaneity

4. Analysis of results

The results section is divided along the line of our methodology. We first present the comparisons of means and median and the descriptive statistics of the sample. Second, we present the simple OLS and Probit regressions. Third we present the Heckman's two-step results. Finally we provide the simultaneous equation regression results.

4.1 Statistical analysis of the variables

We present in Table 4 the descriptive statistics before and after cross-listing into the United States, with the t-test of whether the means are the same and the Wilcoxon z-test of whether the medians are the same. Interestingly only two control variables are significantly different before and after cross-listing: firm size, as measured by the market value of equity (*MVE*) for the median or its log transformation (*ln_MVE*) for the mean and median and the presence of a *Blockholder*

that owns at least 10% of the outstanding shares. More specifically, we find that firms are statistically larger – approximately 30% larger – after cross-listing in the United States (at least as measured by the market value of equity) and are less likely to have an important shareholder. No other control variable is significantly different before and after cross-listing.

INSERT TABLE 4 HERE

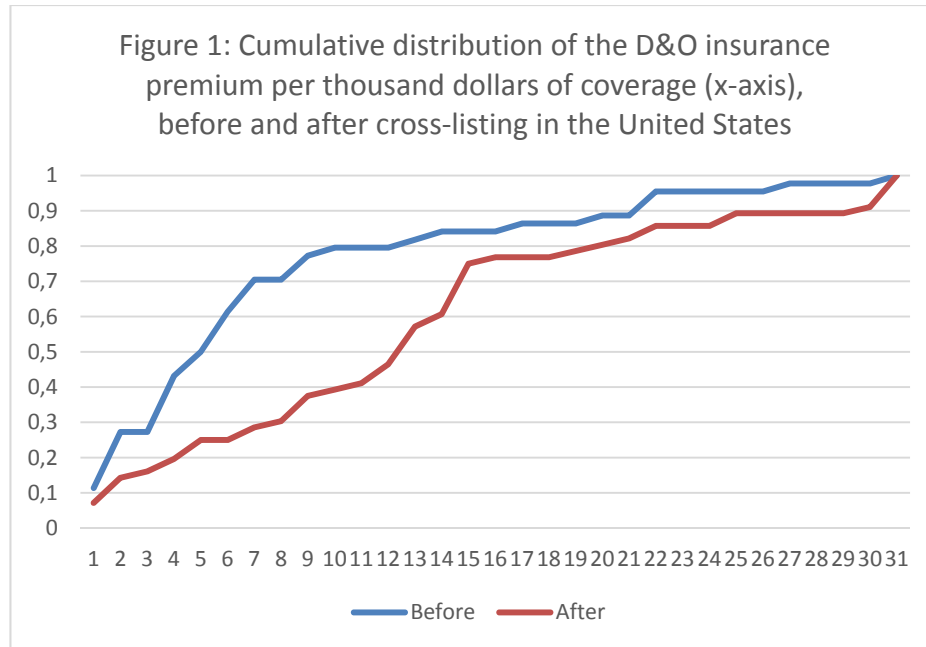
It is normal for the companies' stock capitalization to increase on average in time since this effect only reflects the positive yield of these companies' stock. However, it seems odd to us that the stock's market value increases (increasing *ln_MVE*) whereas the ratio representing the *Growth* opportunities decreases (although the decrease is not statistically significant). Since the companies' average debt ratio for this sample remains stable (*Debt_ratio*), the reduction in *Growth* must mean that the companies' book value of the assets increases more quickly on average than their market value. This can be due to the fact that these companies, which are for the majority small and medium size capitalizations, are naturally becoming more mature, which by definition means fewer investment opportunities. Another possibility is that in the two years between the annual reports we use the companies grew through a series of acquisitions which would have the effect of making assets, and especially of intangible assets such as the goodwill, increase rapidly.

With respect to the governance variables, we observe that the proportion of firms with an important shareholder (*Blockholder*) decreased from 60% to 44% following cross-listing. Although this effect could be subject to more extensive research, it seems to concur with Stulz (1999) and Coffee (1997, 2002) who both suggest that cross-listing in the United States decreases the influence of important shareholders. This is not necessarily a good thing in terms of managerial supervision since Alchian and Demsetz (1972) and Shleifer and Vishny (1986) suggest that block holders are better monitors since they have more to lose (see Morck *at al.* 1988, and especially Shleifer and Vishny 1997 for more on the topic). It is interesting to note the proportion of independent directors did not change significantly with cross-listing.

For the D&O insurance data that can be found at the bottom of Table 4, we note that 47% of the companies in the sample had D&O insurance before cross-listing compared to 60% after cross-listing. This effect is consistent with our main hypothesis and with the observations made by Clarkson and Simunic (1994) that having a company's shares listed in the United States exposes its directors and officers to more litigation. Although companies are more likely to purchase D&O insurance after cross-listing in the United States, *Coverage* does not increase significantly. This is not due to the addition of new insured companies since if we were to concentrate only on those 44 companies that were insured before cross-listing, their average policy limit is \$37 million after cross-listing compared to \$35 million before cross-listing (a non-significant change).

As *Premium* increases two-fold after cross-listing and *Coverage* barely moves, it is normal to see that *Rate-on-line* increases significantly after cross-listing, going from \$8.72 per \$1000 of coverage before cross-listing \$14.01 per \$1000 after.

The results in Table 4 allow us to reach the following conclusions. First, listing in the United States increases the likelihood of having D&O insurance by approximately 20%, but the impact on the amount of coverage sought does not increase. Second, the premium that firms must pay to protect their directors' and officers' personal wealth in the event of a lawsuit increases two-fold. Third, the unit price of insurance also increases significantly after cross-listing. The change is made clearer in Figure 1 where we plot the cumulative distribution before and after cross-listing (the x-axis is the *Rate-on-line*). We see a clear rightward shift in the distribution of *Rate-on-line*.



It seems that being listed in the United States does not increase a Canadian firm’s market value of equity faster than its book value, and does not increase the amount of protection sought by managers who were already covered by a D&O liability insurance policy. Cross-listing does, however, increase the premium paid for D&O insurance. The control variables hardly vary on average and those that do are intuitively opposite to the observed increase in the D&O premiums. Obviously, an in-depth econometric analysis is warranted to verify our main hypotheses.

In addition to comparing the variables before and after cross-listing, it is worthwhile to compare the companies based on their managers’ decision to have D&O insurance or not before and after cross-listing. Table 5 presents such an analysis, both with respect to means and medians.

INSERT TABLE 5 HERE

It seems that insured firms are statistically different from non-insured firms, both before and after cross-listing in terms of size (insured firms are larger), and in terms of board independence (insured firms seem to have more independent directors). Insured firms also seem to have less growth prospect and a lower market-to-book ratio, but only before cross-listing into the United States. After cross-listing there is no statistical difference. A possible explanation is that it is the firms that

have insurance that are able to gain more in market value compared to their book value. This result is also evident when we look at *ln_MVE* as the only firms that seem to gain significant market wealth following cross-listing are those firms that have insurance. Interestingly, the uninsured firms only grow in terms of *ln_Assets*.

Comparing medians and means with respect to whether the firms has insurance or not gives us an idea of how we should proceed with the model specification of the probit analysis of whether a firm has insurance or not.

4.2 Basic regression models: Probit and OLS

It is clear that the decision to purchase insurance is an important one for the firms that decide to cross-list into the United States given the documented higher propensity to litigate in the U.S. than in Canada. We will therefore use a probit analysis, with *Purchase* being the dependent variable. The other part of this basic regression model section will be to look at simple OLS regressions to explain *Premium*, *Coverage* and *Rate-on-line*, in dollar values as well as in log-transformations.

4.2.1 Purchasing decision: Probit analysis

Table 6 shows the results for the probit regressions of the *Purchase* variable on the relevant independent variables. The different regression models in the table generally tell the same story: Apart from firm size and the board's independence, not many firm aspects seem to have an impact on a firm's decision to purchase D&O liability insurance.

INSERT TABLE 6 HERE

The first model explains the decision to purchase insurance using firm size (*ln_Assets* or *ln_MVE*), *Crosslisting*, growth opportunities (*Growth*) and the proportion of independent directors on the board (*Independence*). These were the only variables that seemed to be statistically different across insurance protection. As it will be the case in most regression models throughout the paper, the variable of interest is *Crosslisting* since we want to see a firm's decision to cross-list its shares of common stock has an impact on its decision to have insurance, on the amount of insurance it

purchases and on the premium it pays for that insurance. As we see in Model 1 of Table 6, cross-listing does not seem to have any impact on the firm's decision to have insurance or not. It appears clear that only firm size¹⁰ and the proportion of independent directors on the board have an impact on the decision to carry insurance or not.

In Model 2, we throw in the probit regression a dummy for the riskiness of the industry (*Riskiness*), the fact that the CEO is also chairman of the board (*Duality*), the size of the board (*BoardSize*) and the presence of at least one important shareholder (*Blockholder*). As we see, none of these variables seem to have an impact on the firm's decision to insure its directors and its officers. Moreover, the significance of firm size decreases to less than five percent.¹¹ We can therefore say with much confidence that firms with more independent directors are more likely to have D&O insurance, in line with the view that to attract more independent directors a firm must offer them protection in the event that a lawsuit is brought against them as representatives of the firm.

Model 3 presents the same regression model as Model 1, but with time fixed effects; results remain generally the same (and none of the year dummy variables appear to be significant at the 5% level or better). In Model 4 and 5, we run the same regression as Model 1, but selecting only those observations prior to cross-listing (Model 4) and posterior to cross-listing (Model 5). In both subsamples we see that *Independence* is significant, whereas firm size is significant at the 5% level only after cross-listing whereas Growth has a significant impact on the likelihood to have D&O insurance only before cross-listing (and at the 10% level only).

In all the regression models, the only constant is the fact that the proportion of independent directors is significantly related to the purchase of D&O insurance. All other variables are either never significant in explaining the likelihood of purchasing D&O insurance, or are not reliably significant across different model specifications. *Independence* is therefore a very likely candidate

¹⁰ Whether we use *ln_Assets* or *ln_MVE* makes no difference (and the model has a better fit with the log transformation of firm size than with *Assets* or *MVE* directly); we present the results for only one to lighten the reading of the paper.

¹¹ The reduction in the level of significance of firm size is not due to the 10 observations that are lost because of missing variables.

for an instrument when we will be running our Heckman selection regression. This instrument will be the more useful that the correlation between *Independence* and *Premium*, *Coverage*, *Rate-on-Line*, and their log transformation is less than 10% in absolute value.

4.2.1 Coverage and Premium: OLS analysis

We present in Table 7 the basic OLS regression results that can explain the D&O liability insurance policy limit (*Coverage*) in Panel A, the total *Premium* paid in Panel B, and the ratio of the two (*Rate-on-Line*) in Panel C, and their log transformation in their respective panels.

INSERT TABLE 7 HERE

With respect to coverage, we hypothesized earlier that firm size (and here we will be using the market value of equity as argued in Boyer and Tennyson, 2014), *Growth*, *Independence*, *BoardSize*, and *Blockholder* should have a positive impact on *Coverage*. The impact of *DebtRatio* and of the firm's return on assets (*ROA*) are uncertain. Of course, the variable of interest remain *Crosslisting* which also should be positively related to *Coverage* if larger lawsuits are indeed more important in the United States. Model 1 of Panel A of Table 7 presents the most simple regression with only size and *Crosslisting* as explanatory variables. In Model 2 we include all other control variables, and we add time fixed effects in Model 3. In Models 4, 5, and 6 are equivalent to Models 1, 2, and 3, with the difference that we use the log transformation of the policy limit (*ln_Coverage*) as the dependent variable and the log of the market value of equity (*ln_MVE*) as a control.

In all model specifications, we observe that only size and *DebtRatio* are significant in explaining the amount of D&O liability insurance coverage purchased by the firms. This implies that larger firms and firms that rely more on debt financing will purchase more insurance to protect their directors and officers. Board and Governance characteristics do not seem to have an impact on the amount of D&O liability insurance that was purchased. What is surprising is that the main variable of interest, *Crosslisting*, is not significant in any of the regression models.

In Panel B we present OLS regressions to explain the D&O liability insurance premium. We

hypothesize again that firm size and *Crosslisting* should be important positive factors in the determining *Premium*. We also expect *Growth*, *Duality*, and *BoardSize* to have positive effects on *Premium* because the first two are linked with greater probability of litigation (more risk of free cash flows and more risk of managerial shirking) and greater cost of litigation because more people need to be defended in the event of a lawsuit. *ROA* and the presence of a *Blockholder* could also affect *Premium*, but the net effect is not obvious.

Panel B of Table 7 provides our most interesting result yet in terms of the impact of cross-listing into the United States as the *Crosslisting* variable is significant at the 0.5% level in all regressions. The point estimate of the *Crosslisting* variable is also economically significant; it appears that following cross-listing, D&O insurance premiums increased by approximately \$200,000, a doubling of the premium paid on average. When we look at the *ln_Prem* regressions instead, the increase is also significant of the order of 75% of the initial premium amount. That is also statistically and economically significant.

Firm size also seems to have an impact on the premium paid, especially when we look at the log transformation of the premium. The impact of size is less obvious when the premium dollar amount is used instead of its log transformation. Note, however, that the number of board members, which is highly correlated with firm size, is significant in Model regressions 2 and 3.

Return on assets seems to have a negative impact on the premium paid, as should be expected since more profitable firms (and firms with higher and more stable cash flows) are less likely to be sued since they are less likely to see their stock price drop.

The final panel of Table 7 presents the combined regression for the *Rate-on-line*. Given that an insurance contract's rate-on-line is only the premium divided by the coverage – in our case, the premium per 1000 dollars of coverage – we hypothesized that whatever control variable had a positive (resp. negative) impact on *Premium* in Panel B would have a positive (resp. negative) impact on *Rate-on-line*, and that whatever control variable had a positive impact (resp. negative) on *Coverage* in Panel A would have a negative (resp. positive) impact on *Rate-on-line*. The

variables for which we have a clear prediction are *Crosslisting*, which should increase the *Rate-on-line* since it had no impact on *Coverage* and a significant impact on *Premium*, *DebtRatio*, which should decrease *Rate-on-line*, *ROA*, which should decrease *Rate-on-line*, and *BoardSize* which should increase *Rate-on-line*.

Model 1 of Panel C presents this exact regression using the premium paid per thousand dollars of coverage as the dependent variable, whereas Model 4 used the log transformation of the rate-on-line. Only the *Crosslisting* and the *ROA* variables are significant in explaining the premium-to-coverage ratio both regression models. *BoardSize* is not significant in neither, whereas *DebtRatio* is significant at the 10% level in Model 1 only. Focusing on the *Crosslisting* coefficient, which is the variable of interest in this regression, we see that cross-listing into the United States increases the firm's cost of D&O insurance by approximately \$5 dollars per thousand of coverage (or \$5000 per one million dollars of coverage).

It is interesting to see in the Panel C of Table 7 that firm size does not seem to have an impact on the *Rate-on-line*. In fact, no variable other than *Crosslisting* is significant in every model specification.¹²

It is important to reiterate that these are merely OLS regression results that in no way take into account the possible selection bias associated with purchasing insurance or not, not the simultaneous nature of premium and coverage. Although the next section of the paper addresses those issues, the basic OLS results that we just presented will not change much in terms of the main variable of interest in the sense that cross-listing has an important impact on the premium paid and on the premium per dollar of coverage, but very little on the decision to have insurance or on the amount of coverage purchased.

¹² Another possible model specification would have been to include the premium index in the regression. This is not necessary given our use of year fixed effects that essentially takes the place of the premium index. Nevertheless, because of the relatively small number of data points, it may be important to bear in mind that the premium index represents an alternate specification that has the benefit of being slightly more parsimonious than the array of year fixed effect variables.

4.3 Heckman two-step analysis

It could very well be argued that the decision to insure is endogenous such that the sample of firms that insure and the sample of firms that do not are not assigned randomly. This means that the estimation of coverage, premium, and rate-on-line may be slightly biased. This section of the paper is devoted to answering this possible bias by relying on a two-step estimator as developed by Heckman (1979). To do so, we need to specify a selection equation (i.e., the decision to insure or not) and the effect regression (premium, coverage or rate-on-line). We will be using the regression presented as Model 1 in Table 6 as our main selection equation. Panel A (resp. B and C) of Table 8 presents the second stage regression results of the Heckman regression model using maximum likelihood for *Coverage* (resp. *Premium* and *Rate-on-line*). In all cases the OLS regression results remain valid.

INSERT TABLE 8 HERE

Panel A of Table 8 presents 4 regression models for coverage that are for all purpose identical to the OLS regressions we presented earlier, with the difference that the selection bias, if it exists, has been corrected for. Models 1 & 2 present the regression results with *Coverage* as the dependent variable, whereas Models 3 & 4 present the regression results with the log transformation of coverage as the dependent variable. Models 2 & 4 include year fixed effect in the second stage regression. As we stated previously, the first stage regression (or the *selection regression*) is the one that we presented in Model 1 of Table 6.

Throughout the four Models of Panel A, we see that the only variable which has a significant impact on the policy limit is the firm's debt-to-asset ratio. All other variables are either always insignificant or they are only significant in some model specification. Of particular interest is the result that cross-listing in the United States remains quite insignificant suggesting, again, that listing in the United States does not increase the amount of insurance that corporation are purchasing to cover their directors and officers in the event of litigation.

The regression results we present in Panel B attempt to explain the size of the D&O liability

insurance premium paid by Canadian corporations that cross-list into the United States. As for the *Coverage* results of Panel A, the *Premium* results of Panel B are quite similar to the OLS results we presented in Table 7. Of the six Model results displayed in Panel B, the first three explain the premium in thousands of dollars whereas the last three explain the log transformation of *Premium*. Models 3 & 6 are of particular interest since we added to the previous regression models the *Coverage* variable under the hypothesis that, perhaps, firms choose coverage before choosing premium such that all that explains premium is the size of the coverage.

The main variable of interest remaining the Crosslisting dummy variable, we see that the premium increases by almost \$200,000 following cross-listing, even when we control for the potential selectivity bias (which is significant in only one regression model), year fixed effects and the chosen coverage. This represents a doubling of the average premium paid. No other control variable is significant in explaining the premium paid, not even firm size in Models 1 & 2. When we control for *Coverage*, we also see a marked increase in the coefficient of *Crosslisting* in explaining both the Premium and its log transformation.

Finally, Panel C presents the regression results for the Rate-on-line and for its log transformation. By controlling for the potential selection bias, we again see in the four regression models (1 & 2 in value, 3 & 4 in log, 2 & 4 using year fixed effects) that the only variable that is constantly and significantly significant in explaining the premium-to-coverage ratio is whether the firm has cross-listed its shares of common stock on a market in the United States.

Returning to the results related to the *Premium* in Panel B, we recall that we included in Models 3 & 6 the firm's choice of coverage and we saw that it was positively associated with *Premium*. This suggests that, perhaps, our econometric modelling is wrong and that *Coverage* and *Premium* are chosen simultaneously. The next series of results entertain that possibility.

4.4 Simultaneity issues

We present in Table 9 the results of the simultaneous three-stage-least-square regressions for Coverage and Premium controlling for year fixed effects and the selection bias. In Models 1, 2 & 3

we present the regression results for *Premium* and *Coverage* in levels, and Model 4 presents the results for the log transformation of *Premium* and *Coverage*. The selection bias is corrected in Models 3 & 4 by using the inverse-Mills ratio of the probit regression presented in Model 1 of Table 6. Models 2, 3, & 4 include *Coverage* in determining *Premium*. There are only 95 observations that can be used since we need both the *Coverage* and the *Premium* to be observable.

INSERT TABLE 9 HERE

As it is obvious from the results presented in Table 9, the main message of the paper remains true even after controlling for the simultaneity of *Premium* and *Coverage*. Of particular interest is the fact that the *Crosslisting* coefficient remains close to 200, suggesting that once we control for everything, cross-listing into the United States increases the D&O liability insurance premium by \$200,000 (or essentially doubles according to Model 4) even though the policy limit does not change. Even more interesting perhaps is the fact that once we control for the simultaneous choice of *Premium* and *Coverage*, *Coverage* no longer has any predictive power on *Premium*... and neither does firm size for that matter when *Coverage* is included in the *Premium* regression.

4.5 Limited sample with more information

It is true that we do not exactly have the same sample of companies before and after cross-listing given that some firms were not purchase D&O insurance before cross-listing, or were not giving enough information about the contract for us to be able to calculate a rate-on-line before or after cross-listing. To make sure that the message of the paper is not due to the differences in the samples pre and post cross-listing, we present simultaneous regression results (akin to Table 9) but using only those 40 firms (80 observations) that purchased D&O liability insurance before **and** after cross-listing into the United States and for which we have all the necessary information related to *Coverage* and *Premium*. The results are presented in Table 10.

INSERT TABLE 10 HERE

By limiting our simultaneous equation analysis to only those firms that have D&O insurance before and after cross-listing, we note some small changes in the results, but none more spectacular than on the coefficient of the *Crosslisting* variable. After controlling for the selection bias and the year fixed effect, it seems that cross-listing into the United States decreases the amount of coverage needed (at least with respect to Model 2 of Table 10). The result does not hold when we take the log transformation of *Premium* and *Coverage* (Model 4), but the coefficient remains negative. The impact of cross-listing on the D&O liability insurance premium increases to be equal to approximately \$290,000 in Model 2, or by close to 200% according to Model 4. These results are statistically and economically significant.

4.6 Coefficient values before and after crosslisting (NOT SURE OF ANALYSIS HERE)

The last table we present (Table 11) examines the value of the coefficients before and after cross-listing based on the models of Table 8 (Heckman selection models). For Coverage, we present Model 1 and 3 of Panel A, whereas we present Model 1 and 4 of Panel B for Premium.

INSERT TABLE 11 HERE

Looking at the two panels of Table 11 (before cross-listing in Panel A to the left and after cross-listing in Panel B to the right), we note that the only differences in terms of what determines Coverage is the fact that the firm's debt ratio is positively and significantly linked to coverage after cross-listing whereas it was not significantly linked before. That being said, the value of the coefficient after cross-listing is never significantly different from the value of the coefficient before cross-listing.

With respect to *Premium*, again we have that only one variable seems to have had a different impact before and after cross-listing, and that is the measure of Growth. Before cross-listing, it appears that firms which had greater growth opportunities were paying significantly less for their D&O liability insurance policy than firms with smaller growth opportunities. This is no longer the case after cross-listing.

The regression results in Table 11 tell us that the determining factors of D&O insurance liability coverage and premium are approximately the same before and after cross-listing.

5. Conclusion

The main goal of our study was to establish a link between the risk of litigation associated with cross-listing in the United States by looking at the change in the premium paid by firms to acquire Directors' and Officers' liability insurance to protect their managers. Our results suggest that there is a marked increase in the cost of D&O insurance of between 65% and 200% compared to the premium paid when the company was being traded in Canada only. Our conclusions are economically and statistically robust. We find no evidence, however, that cross-listing a company's shares of common stock in the United States is associated with a higher likelihood of having insurance or with a higher level of insurance. In other words, the only effect that cross-listing has on D&O insurance is on the premium and nothing else.

What can our results tell us? If D&O liability insurance is indeed a non-biased indicator for litigation risk, as suggested by Core (2000) and by Boyer and Stern (2014), then the D&O premium is able to measure a company's increased litigation risk when cross-listing in the United States. The present study reinforces the use of D&O insurance in financial literature in regards to company governance. It would be interesting to assess whether the relationship between D&O liability insurance premium increases and the change in governance practices, such as aggressive accounting practices or the quality of the operational and financial planning, as supplied by management.

6. References

1. Adams R., B.E. Hermalin and M.S. Weisbach (2010). The Role of Board of Directors in Corporate Governance: A Conceptual Framework and Survey. *Journal of Economic Literature*, 48: 58-107.
2. Amihud, Y. and H. Mendelson (1986). Asset pricing and the bid-ask spread. *Journal of Financial Economics*, 17: 223-249
3. Bancel, F. and U.R. Mittoo (2004). Cross-country determinants of capital structure choice: a survey of European firms. *Financial Management*, 33 (4): 103-132
4. Bajaj, M, S.C. Mazumdar and A. Sarin (2000). Security class action settlements: an empirical analysis. *Santa Clara Law Review*, 43: 1001-1033
5. Baker, T. and S.J. Griffith (2007a). Predicting Corporate Governance Risk: Evidence from the Directors' and Officers' Liability Insurance Market. *University of Chicago Law Review*, 74: 1-58.
6. Baker, T. and S.J. Griffith (2007b). The Missing Monitor in Corporate Governance: The Directors' and Officers' Liability Insurer. *Georgetown Law Journal*, 95: .
7. Baker, T. and S.J. Griffith (2008). How the Merits Matter: Directors' and Officers' Insurance and Securities Settlements. *University of Pennsylvania Law Review*, 157: 755-832.
8. Bebchuk, L., A. Cohen and A. Ferrell (2009). What matters in corporate governance? *Review of Financial Studies* 22, 783–827.
9. Bebchuk, L., A. Cohen and A. Ferrell (2013). Learning and the Disappearing Association between Governance and Returns. *Journal of Financial Economics*, 108: 323-348.
10. Bebchuk, L. A. and A. Hamdani (2009). The Elusive Quest for Global Governance Standards. *University of Pennsylvania Law Review*, 157: 1263-1317.
11. Bebchuk L.A. and M.S. Weisbach (2010). The State of Corporate Governance Research. *Review of Financial Studies*, 23: 939-961.
12. Boyer, M.M. (2005). Assessing the Demand for Directors' and Officers' Insurance Using Public Information. *Journal of Forensic Accounting*, 6: 389-410.
13. Boyer, M.M. (2003, 2014). Directors' and Officers' Insurance and Shareholders' Protection. *Journal of Financial Perspectives*, 2(1): 107-128.
14. Boyer, M.M. and A. Hanon (2012). Protecting directors and officers from liability arising from

- aggressive earnings management. *Insurance and Risk Management* 77(1): 33-58.
15. Boyer, M.M. and L.H. Stern (2012). Is corporate governance risk valued? Evidence from directors' and officers' insurance. *Journal of Corporate Finance*, 18: 349-372
 16. Boyer, M.M. and L.H. Stern (2014). D&O Insurance and IPO Performance: what can we learn from insurers? *Journal of Financial Intermediation* (forthcoming).
 17. Boyer, M.M., and S. Tennyson (2014). Directors' and Officers' Liability Insurance, Corporate Risk and Risk Taking: New Panel Data Evidence on the Role of Directors' and Officers' Liability Insurance. *Journal of Risk and Insurance*, forthcoming.
 18. Cao, Z. and G.S. Narayanamoorthy (2011). The Effect of Litigation Risk on Management Earnings Forecasts. *Contemporary Accounting Research*, 28: 125-173.
 19. Chen, C.-W., B. Yi and J. B. Lin (2012). Directors' and Officers' Liability Insurance and Managerial Compensation. <http://www.tl.ntu.edu.tw/2012/asianfa2012/fullpaper/10052.pdf>
 20. Chen, Z., O.Z. Li and H Zou (2012). Directors' and Officers' Liability Insurance and the Cost of Equity. Available as SSRN: <http://ssrn.com/abstract=1837912>.
 21. Chung, H. H. and J. Park-Wynn (2008). Managerial legal liability coverage and earnings conservatism. *Journal of Accounting and Economics* 46: 135-153.
 22. Chalmers, J.M.R., L.Y. Dann and J. Harford (2002). Managerial Opportunism? Evidence from Directors' and Officers' Insurance Purchases. *Journal of Finance*, 57: 609-639.
 23. Chen, T.-J. and S.-H. Li (2010). Directors' & officers' insurance, corporate governance and firm performance. *International Journal of Disclosure and Governance* 7: 244-261.
 24. Clarkson, P. and D. Simunic (1994). The Association between Audit Quality, Retained Ownership and Firm-Specific Risk in United States vs. Canadian IPO markets. *Journal of Accounting and Economics*, 17: 207-228.
 25. Coffee, J.C. (1999). The future as history: The prospects for global convergence in corporate governance and its implications. *Northwestern University Law Review*, 93: 641-708
 26. Coffee, J.C. (1999). Racing to the top? The impact of cross-listings and stock market competition on corporate governance. *Columbia Law Review*, 102: 1757-1831
 27. Comolli, R. and S. Starykh (2014). *Recent Trends in Securities Class Action Litigation (2013 Full-Year Review): Large settlements get larger; small settlements get smaller*. NERA Economic Consulting Publication.

28. Core, J.E. (1997). On the corporate demand for directors' and officers' insurance. *The Journal of Risk and Insurance*, 64 (1): 63-87
29. Core, J.E. (2000). The directors' and officers' insurance premium: an outside assessment of the quality of corporate governance. *Journal of Law, Economics and Organization*, 16 (2): 449-477
30. Core, J.E., W. Guay and T. Rusticus (2006). Does weak governance cause weak stock returns? An examination of firm operating performance and investors' expectations. *Journal of Finance*, 61: 655-687.
31. Cremers, M., V. Nair and K. John (2009). Takeovers and the cross-section of returns. *Review of Financial Studies*, 22: 1409-1445.
32. Crawford Panel (2007). One Year On: Seeing the Way Forward. Document <http://www.crawfordpanel.ca/OneYearOn.pdf>
33. Doidge, C. (2003). U.S. cross-listing and the private benefits of control: evidence from dual-listed firms. *Journal of Financial Economics*, 72: 519-553
34. Doidge, C., A.G. Karolyi and R.M. Stulz (2004). Why are foreign firms listed in the U.S. worth more? *Journal of Financial Economics*, 71: 205-238
35. Emerson, H.G. and G.A. Clarke (2003). *Bill 198 and Ontario's Securities Act: Giving Investors and the OSC added muscle*. Fasken Martineau DuMoulin LLP Publication, 3rd Annual Directors' Governance Summit (November 2003).
36. Foerster, S.R. and G.A. Karolyi (1998). Multimarket trading and liquidity: a transaction data analysis of Canada-US interlistings. *Journal of International Financial Markets, Institution and Money*, 8: 393-412.
37. Gillan, S. and C. Panasian (2014). On Lawsuits, Corporate Governance, and Directors' and Officers' Liability Insurance. *Journal of Risk and Insurance* (forthcoming).
38. Gompers, P., J. Ishii and A. Metrick (2003). Corporate governance and equity prices. *Quarterly Journal of Economics* 118: 107-155.
39. Griffith, S.J. (2006). Unleashing a Gatekeeper: Why the SEC Should Mandate Disclosure of Details Concerning Directors' and Officers' Liability Insurance Policy. *University of Pennsylvania Law Review*, 154: 1147-1208.
40. Gupta, M. and P. Prakash (2012). Information Embedded in Directors and Officers Insurance Purchases. *The Geneva Papers on Risk and Insurance - Issues and Practice* 37: 429-451.

41. Gutiérrez, M. (2003). An Economic Analysis of Corporate Directors' Fiduciary Duties. *Rand Journal of Economics*, 34: 516-535.
42. Heckman, J. (1979). Sample Selection Bias as a Specification Error. *Econometrica*, 47: 153-161.
43. Heys, B.A. and M.L. Berenblut (2012). *Trends in Canadian Securities Class Actions (2011 Update): Pace of Filings Grows, Pace of Settlements Slows*. NERA Economic Consulting Publication.
44. Heys, B.A., M.L. Berenblut and J. Dwhyte (2014). *Trends in Canadian Securities Class Actions (2013 Update): Filings Steady, Law in Flux and Settlements on the Rise*. NERA Economic Consulting Publication.
45. Holderness, C.G. (1990). Liability Insurers as Corporate Monitors. *International Review of Law and Economics*, 10: 115 -129.
46. Hwang, J.H and B. Kim (2013). Directors' and officers' liability insurance and corporate risk-taking. APJFS 2013 Conference, <http://www.apjfs.org/conference/2013/cafmFile/5-4.pdf>.
47. La Porta, R., F. Lopez-de-Silanes, A. Shleifer and R. Vishny (1998). Law and Finance. *Journal of Political Economy*, 106(6): 1113-1155.
48. LaCroix, K.M. (2012). Canadian Securities Class Action Lawsuit Filings Hit Record in 2011. The D&O Diary, <http://www.dandodiary.com/2012/02/articles/securities-litigation/canadian-securities-class-action-lawsuit-filings-hit-record-in-2011/>. Posted on February 2, 2012 (last visited: 10 February 2012).
49. Larcker, D.F. and B. Tayan. (2013). Where Experts Get it Wrong: Independence vs. Leadership in Corporate Governance. Rock Center for Corporate Governance, Stanford University Working Paper.
50. Lin, C., M.S. Officer and H. Zou (2012). Directors' and officers' liability insurance and acquisition outcomes. *Journal of Financial Economics*, 102: 507-525.
51. Lin, C., M.S. Officer, R. Wang and H. Zou (forthcoming). Directors' and officers' insurance and loan spreads. *Journal of Financial Economics*, <http://ssrn.com/abstract=1865679>.
52. Linck, J.S, J.M. Netter and T. Yang (2009). The Effects and Unintended Consequences of the Sarbanes-Oxley Act on the Supply and Demand for Directors. *The Review of Financial Studies*, 22(8): 3287-3328.
53. McTier, B.C. and J.K. Wald (2011). The Causes and Consequences of Securities Class Action Litigation. *Journal of Corporate Finance*, 17: 649-665.

54. Morck, R. (2005). *A History of Corporate Governance around the World*. University of Chicago Press, Chicago, 680 pages.
55. Morck, R., A. Shleifer and R. Vishny (1988). Management ownership and market valuation: An empirical analysis. *Journal of Financial Economics* 20(3): 293-316.
56. Morck, R. and L. Steier (2005). The Global History of Corporate Governance: An Introduction. IN R. Morck (Ed.), *A History of Corporate Governance around the World*. University of Chicago Press, Chicago, pp. 1-64.
57. Miller, D.P. (1999). The market reaction to international cross-listings: evidence from Depository Receipts. *Journal of Financial Economics*, 51: 103-123
58. O'Sullivan, N. (1997). Insuring the Agents: The Role of Directors' and Officers' Insurance in Corporate Governance. *Journal of Risk and Insurance*, 64: 545-556.
59. Park Wynn, J. (2008). Legal Liability Coverage and Voluntary Disclosure. *The Accounting Review*, 83: 1639-1669.
60. Romano, R. (1991). The Shareholder Suit: Litigation without Foundation? *The Journal of Law, Economics and Organization* 7: 55-87.
61. Romano, R. (2006). The states as a laboratory: legal innovation and state competition for corporate charters. *Yale Journal on Regulation* 23: 209–247.
62. Rose, P. (2007). The Corporate Governance Industry. *Journal of Corporation Law*, 32(4): 887-926.
63. Shleifer, A. and R. Vishny (1997). A survey of corporate governance. *Journal of Finance* 52: 737–783.
64. Stulz, René M. (1999). Globalization of equity markets and the cost of capital. *Journal of Applied Corporate Finance*, 12: 8-25.
65. Suret, J.-M. and C. Carpentier (2009). *Proposal for a Single Securities Commission in Canada: Comment and Discussion*. <http://ssrn.com/abstract=1355283>.
66. Towers-Watson (2011, 2012, 2013) and Tillinghast Towers-Perrin (2002 through 2010). *Directors and officers Liability Survey*. Executive Summary of U.S and Canadian Results.
67. Zou, H. and M. Adams (2008). Debt Capacity, Cost of Debt, and Corporate Insurance. *Journal of Financial and Quantitative Analysis* 43: 433-466.

7. Appendix: Tables

Table 1 – Number of companies, firm-years, and average premium and coverage

The tables gives the distribution in time of firms that decided to cross-list into the United States as well as the years for which the financial statements are used (one year before and one year after). For instance, for a company that cross-listed in 1997, we downloaded the financial information for the years 1996 (year prior) and 1998 (year after). The number of observations and the information about having D&O insurance include both financial statements before and after cross-listing. Often, the calendar year does not match with the fiscal year, which explains some apparent misspecifications in the table.

Year of listing in the U.S.	Number of cross-listing firms	Observations	Firms with D&O insurance	Average D&O premium	Average D&O coverage	Average D&O rate-on-line
1996	0	1	1	22,130 \$	10,000,000 \$	2.213
1997	1	1	1	35,208 \$	5,000,000 \$	7.042
1998	1	4	3	62,038 \$	23,333,333 \$	2.438
1999	3	20	9	113,974 \$	35,000,000 \$	4.390
2000	19	9	6	268,813 \$	50,000,000 \$	5.792
2001	6	28	20	213,135 \$	57,894,737 \$	5.876
2002	9	22	15	278,102 \$	34,333,333 \$	12.073
2003	16	21	12	418,843 \$	35,583,333 \$	14.765
2004	12	36	15	403,976 \$	22,533,333 \$	18.454
2005	20	23	10	362,775 \$	25,500,000 \$	17.111
2006	11	20	8	454,426 \$	33,571,429 \$	13.561
2007	0	11	5	281,975 \$	20,250,000 \$	18.472
Average Sum	98	196	105	298,976 \$	35,810,000 \$	10.183

Table 3 – Descriptive statistics

The table presents the basic descriptive statistics (mean, median, etc.) of the variables used in this paper as a function of their nature.

	Obs.	Mean	Median	5%	95%	Std.Dev.
Listing						
Crosslisting (dummy)	196	0.50	0.50			
Financial variables						
ln_MVE	185	6.01	5.87	3.67	9.03	1.658
Growth	185	3.82	2.30	1.00	9.46	6.259
ROA	195	-0.10	-0.03	-0.61	0.13	0.281
Debt ratio	195	0.34	0.26	0.02	0.88	0.315
Governance variables						
Independance	194	0.68	0.71	0.33	0.88	0.161
Duality (dummy)	187	0.28	0			
Board_size	194	7.84	7	5	14	2.819
Blockholder (dummy)	194	0.52	1			
Other variables						
Riskiness (dummy)	196	0.27	0			
Premium index	196	888	931	503	1237	255
D&O variables						
Purchase (dummy)	196	0.54	1.00			
Premium ('000)	100	299.0	168.7	21.07	1039	338.5
Coverage ('000,000)	105	37.91	20	5	125	45.11
Coverage/MVE	103	69.19	35.54	8.07	268	85.63
Premium/MVE	98	0.69	0.35	0.04	2.73	1.16
Rate-on-line ('.000)	100	11.69	9.38	1.71	33.5	9.99
Ln_RoL	100	2.08	2.24	0.54	3.51	0.924

Table 4 – Descriptive statistics and tests before/after cross-listing

The table presents the basic descriptive statistics of the main variables of interest before and after the firms have cross-listed their shares of common stock in the United States. The table also presents the t-tests for means and a Wilcoxon tests for medians; *, ** and *** represent differences that are significant at the 10%, 5% and 1% levels respectively.

	Time	Mean	Median	5%	95%	Std. err.
MVE	Before	1628	204.3	38.61	8319	492.9
	After	2103	504.1***	39.40	9431	520.1
ln_MVE	Before	5.72	5.32	3.63	9.03	1.641
	After	6.27***	6.22***	3.67	9.15	1.637
ln_Assets	Before	5.01	4.44	2.23	9.82	2.277
	After	5.71**	5.18***	3.07	9.87	2.149
Debt ratio	Before	0.35	0.25	0.02	0.94	0.365
	After	0.32	0.27	0.02	0.86	0.257
Growth	Before	4.16	2.48	1.00	9.46	7.946
	After	3.50	2.15	1.00	9.48	4.201
MB-ratio	Before	3.44	2.96	0.68	9.60	15.87
	After	4.38	2.51	1.01	15.8	5.259
ROA	Before	-0.09	-0.04	-0.63	0.14	0.250
	After	-0.11	-0.03	-2.23	0.38	0.310
Independence	Before	0.66	0.67	0.25	0.88	0.162
	After	0.69	0.73	0.33	0.88	0.159
Board_size	Before	7.72	7	5	14	2.904
	After	7.96	7	5	14	2.742
Blockholder	Before	0.60**	1**			
	After	0.44	0			
D&O variables						
Purchase (dummy)	Before	0.47	0.00			
	After	0.60**	1.00*			
Premium ('000)	Before	190.0	101.5	20.00	687.5	242.4
	After	384.6***	239.7***	35.00	1445	378.6
Coverage	Before	34.67	20	5.00	125.0	47.65
	After	40.44	25	5.00	150.0	43.28
Coverage/MVE	Before	83.23*	44.53*	9.87	276.6	89.60
	After	58.72	34.42	6.36	262.2	81.74
Rate-on-line	Before	8.72	5.93	1,85	22.38	9.261
	After	14.02***	13.18***	1.66	35.73	10.00
Ln_RoL	Before	1.77	1.78	0.62	3.18	0.880
	After	2.33***	2.58***	0.51	3.58	0.888

Table 5 – Descriptive statistics and tests insured/not insured, before/after cross-listing

The table presents means and medians of the main variables of interest before and after the firms have cross-listed their shares of common stock into a stock market in the United States as a function of whether they purchased D&O insurance or not. The table also present the test results concerning the means and medians of variables before and after cross-listing, and between non-purchasers and purchasers. We used t-test for the means and a rank sum Wilcoxon test for the medians; *, ** and *** represent differences that are significant at the 10%, 5% and 1% levels respectively for the cross-listing test (vertical difference), whereas #, ## and ### represent differences that are significant at the 10%, 5% and 1% levels respectively for the purchase test (horizontal test).

Variable		Mean and test of means		Median and test of medians	
		Not insured	Insured	Not insured	Insured
ln_MVE	Before	5.452	5.987 [#]	5.127	5.601 [#]
	After	5.787	6.583 ^{*,###}	5.693	6.480 ^{*,##}
ln_Assets	Before	4.481	5.544 ^{##}	3.931	5.053 ^{###}
	After	5.123 [*]	6.064 ^{##}	4.574 [*]	5.518 ^{###}
Debt ratio	Before	0.327	0.382	0.174	0.363 [#]
	After	0.301	0.339	0.178	0.329
Growth	Before	5.665 ^{##}	2.660	2.991 ^{##}	2.156
	After	3.530	3.487	2.248	2.026
MB-ratio	Before	6.617 ^{##}	3.187	4.262 ^{##}	2.596
	After	4.672	4.205	2.639	2.373
ROA	Before	-0.102	-0.073	-0.058	0.004
	After	-0.157	-0.079	-0.091	-0.002 [#]
Independence	Before	0.634	0.725 ^{###}	0.667	0.714 ^{###}
	After	0.679 [*]	0.734 ^{##}	0.667	0.750 [#]
BoardSize	Before	7.373	8.109	6	8 ^{##}
	After	7.579	8.203	7	8

Table 6 – Decision to purchase a D&O insurance policy

The table presents the probit type regression results for the *Purchase* variable over control variables that include firm size (*ln_Assets*), a dummy for whether the firm has cross-listed into the United States or not (*Crosslisting*), growth opportunities (*Growth*), the proportion of unaffiliated board members (*Independent*), the total number of members on the board (*BoardSize*), and three other dummy variables that account for the firm’s industry’s level of litigation (*Riskiness*), the dual role of CEO and chairman of the board (*Duality*), and the presence of a shareholder that has more than 10% of the shares (*Blockholder*) described in section 3.2. The table reports the values of the coefficients for each regression with, in parentheses, their associated robust standard error. ***, ** and * indicate the degree of significance for 1%, 5% and 10% respectively.

Model number	(1)	(2)	(3)	(4)	(5)
VARIABLES				Pre- Crosslisting	Post- Crosslisting
<i>ln_Assets</i>	0.113** (0.0532)	0.126* (0.0672)	0.103* (0.0591)	0.0473 (0.0790)	0.152** (0.0740)
<i>Crosslisting</i>	0.164 (0.198)	0.170 (0.210)	0.173 (0.204)		
<i>Growth</i>	-0.00903 (0.0171)	0.00153 (0.0144)	-0.00842 (0.0190)	-0.103* (0.0559)	0.0318 (0.0328)
<i>Independence</i>	1.819*** (0.653)	2.511*** (0.707)	1.807*** (0.700)	2.031** (1.004)	1.877** (0.886)
<i>BoardSize</i>		-0.0117 (0.0548)			
<i>Riskiness</i>		0.144 (0.246)			
<i>Duality</i>		0.388 (0.252)			
<i>Blockholder</i>		0.253 (0.206)			
Year Fixed Effect			YES		
Constant	-1.730*** (0.561)	-2.489*** (0.686)	-1.440** (0.731)	-1.231 (0.823)	-1.971** (0.821)
Observations	183	173	180	87	96
Pseudo-R ²	0.08			0.106	0.070

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 7 – D&O contract determinants (OLS regressions)

The table presents the OLS regression results for *Coverage*, *Premium* and *Rate-on-line* and their respective log transformation over a set of independent variables including size and the main independent variable of interest, *Crosslisting*. If cross-listing in the United States is tantamount to being exposed to more litigation risk, we should observe an increase in *Coverage*, *Premium* and *Rate-on-line* following cross-listing. Panels A, B and C present the regression results with respect to *Coverage*, *Premium* and *Rate-on-line* respectively. The panels report the values of each regression’s coefficients with, in parentheses, their associated robust standard error. ***, ** and * indicate the degree of significance for 1%, 5% and 10% respectively.

PANEL A. The determinants of D&O liability insurance coverage						
VARIABLES	(1) Coverage	(2) Coverage	(3) Coverage	(4) ln_Cover	(5) ln_Cover	(6) ln_Cover
MVE	0.00518*** (0.00166)	0.00303* (0.00169)	0.00340** (0.00156)			
ln_MVE				0.506*** (0.0366)	0.502*** (0.0696)	0.518*** (0.0758)
Crosslisting	2.960 (7.833)	6.795 (6.877)	5.909 (6.918)	-0.0689 (0.144)	0.0198 (0.135)	0.0333 (0.122)
Growth		0.197 (0.793)	-0.522 (0.834)		-0.0639 (0.0475)	-0.0964** (0.0465)
DebtRatio		63.94** (27.01)	69.54** (28.15)		0.781** (0.328)	0.765** (0.365)
ROA		12.98 (11.35)	-5.513 (14.65)		-0.347 (0.399)	-1.169*** (0.413)
Independence		9.388 (27.57)	14.62 (27.20)		0.123 (0.484)	0.0266 (0.538)
BoardSize		2.880 (3.189)	2.100 (3.217)		-0.0174 (0.0363)	-0.0288 (0.0360)
Blockholder		4.323 (6.537)	0.454 (6.105)		0.0508 (0.122)	-0.0289 (0.139)
Year Fixed Effect			YES			YES
Constant	25.95*** (6.280)	-26.67 (25.21)	-34.98 (26.12)	13.74*** (0.250)	13.65*** (0.511)	14.10*** (0.521)
Observations	103	101	101	103	101	101
R-squared	0.299	0.476	0.523	0.581	0.657	0.744

Robust standard errors in parentheses; Coverage and MVE are in millions of dollars.
 *** p<0.01, ** p<0.05, * p<0.1

PANEL B. ¹ The determinants of D&O liability insurance premium						
VARIABLES	(1) Premium	(2) Premium	(3) Premium	(4) ln_Prem	(5) ln_Prem	(6) ln_Prem
MVE	0.0331*** (0.0106)	0.0156 (0.0129)	0.0160 (0.0132)			
ln_MVE				0.432*** (0.0499)	0.497*** (0.0649)	0.496*** (0.0670)
Crosslisting	178.0*** (57.48)	185.2*** (58.21)	205.2*** (58.71)	0.549*** (0.182)	0.546*** (0.167)	0.598*** (0.162)
Growth		11.78 (8.988)	14.16 (8.685)		-0.0477 (0.0417)	-0.0374 (0.0400)
ROA		-186.8 (135.8)	-104.5 (167.4)		-1.539*** (0.422)	-1.072** (0.432)
Duality		-57.11 (57.63)	-10.59 (60.08)		-0.147 (0.167)	0.0627 (0.175)
BoardSize		47.26** (18.20)	47.47** (18.63)		-0.0157 (0.0369)	-0.0146 (0.0356)
Blockholder		109.0* (60.41)	108.9 (67.30)		0.147 (0.157)	0.105 (0.169)
Year Fixed Effect			YES			YES
Constant	136.2*** (30.31)	-301.7* (156.3)	-421.1** (165.8)	9.015*** (0.335)	8.785*** (0.310)	7.631*** (0.383)
Observations	98	95	95	98	95	95
R-squared	0.295	0.391	0.474	0.469	0.530	0.616

Robust standard errors in parentheses; Premium is in thousands whereas MVE is in millions of dollars.
*** p<0.01, ** p<0.05, * p<0.1

¹ outreg2 using D:\Aaahah\AAPapers\Papers\DandO\Crosslisting\RawRes_Oct2014\Z_Cross_table7bPrem-ols, word excel replace

PANEL C. The determinants of D&O liability insurance Rate-on-line

VARIABLES	(1) Rate-on- line	(2) Rate-on- line	(3) Rate-on- line	(4) ln_RoL	(5) ln_RoL	(6) ln_RoL
MVE		-0.000268 (0.000192)	-0.000253 (0.000199)			
ln_MVE					-0.0358 (0.0731)	-0.0393 (0.0755)
Crosslisting	4.952** (1.886)	4.882** (1.925)	5.424*** (1.692)	0.540*** (0.173)	0.572*** (0.189)	0.604*** (0.145)
Growth		0.268 (0.232)	0.686*** (0.243)		0.0344 (0.0234)	0.0691*** (0.0233)
DebtRatio	-5.271* (3.089)	-4.108 (3.794)	-1.568 (4.100)	-0.516 (0.323)	-0.343 (0.386)	-0.199 (0.373)
ROA	-17.05*** (4.738)	-16.02*** (4.567)	-6.153 (4.292)	-1.323*** (0.307)	-1.177*** (0.351)	0.0574 (0.374)
Duality		-2.850 (1.946)	-0.827 (2.065)		-0.311* (0.175)	0.0386 (0.173)
BoardSize	0.419 (0.364)	0.616 (0.556)	0.601 (0.529)	0.0107 (0.0308)	0.0126 (0.0387)	0.0175 (0.0415)
Blockholder		0.619 (1.964)	0.239 (2.034)		0.0948 (0.170)	0.0858 (0.154)
Year Fixed Effect			YES			YES
Constant	5.986** (2.780)	4.588 (4.655)	-4.394 (4.795)	1.764*** (0.275)	1.867*** (0.353)	0.323 (0.422)
Observations	99	95	95	99	95	95
R-squared	0.233	0.256	0.480	0.226	0.265	0.581

Robust standard errors in parentheses; Rate-on-line is in dollars per thousand dollars of coverage whereas MVE is in millions of dollars.

*** p<0.01, ** p<0.05, * p<0.1

Table 8– Heckman’s two-step efficient estimates method for D&O insurance

The table presents the second stage regression results of a Heckman selection model for *Coverage*, *Premium* and *Rate-on-line* and their respective log transformation. The set of independent variables includes a measure of firm size and the main independent variable of interest, *Crosslisting*. If cross-listing in the United States is tantamount to being exposed to more litigation risk, we should observe an increase in *Coverage*, *Premium* and *Rate-on-line* following cross-listing. Panels A, B and C present the regression results with respect to *Coverage*, *Premium* and *Rate-on-line* respectively. The panels report the values of each regression’s coefficients with, in parentheses, their associated robust standard error. ***, ** and * indicate the degree of significance for 1%, 5% and 10% respectively.

PANEL A. The determinants of D&O liability insurance coverage				
VARIABLES	(1) Coverage	(2) Coverage	(3) ln_Cov	(4) ln_Cov
MVE	0.00335 (0.00209)	0.00354* (0.00192)		
ln_MVE			0.427*** (0.0652)	0.448*** (0.0699)
Crosslisting	1.860 (7.920)	1.761 (7.879)	-0.0520 (0.157)	-0.0167 (0.130)
Growth	0.104 (0.893)	-0.476 (0.783)	-0.0378 (0.0324)	-0.0711** (0.0316)
DebtRatio	52.19** (22.31)	57.93*** (21.07)	0.603* (0.334)	0.684** (0.300)
ROA	2.923 (15.77)	-14.22 (19.43)	-0.246 (0.329)	-1.021*** (0.356)
BoardSize	1.874 (3.486)	1.217 (3.544)	0.000163 (0.0320)	-0.0128 (0.0317)
Blockholder	7.251 (6.289)	2.630 (6.574)	0.0765 (0.120)	-0.0388 (0.132)
Year Fixed Effect		YES		YES
Selection bias	2%		2%	2%
Constant	11.29 (31.98)	7.025 (27.08)	14.49*** (0.415)	14.15*** (0.504)
Censored Obs.	80	80	80	80
Observations	181	181	181	181

Robust standard errors in parentheses; Coverage and MVE are in millions of dollars.
 *** p<0.01, ** p<0.05, * p<0.1

PANEL B. The determinants of D&O liability insurance premium ²						
VARIABLES	(1) Premium	(2) Premium	(3) Premium	(4) ln_Prem	(5) ln_Prem	(6) ln_Prem
MVE	0.0149 (0.0125)	0.0161 (0.0119)	0.00905** (0.00382)			
ln_MVE				0.522*** (0.0677)	0.519*** (0.0697)	0.200** (0.0859)
Crosslisting	164.7*** (58.23)	177.1*** (55.42)	194.8*** (61.13)	0.576*** (0.164)	0.629*** (0.153)	0.708*** (0.167)
Growth	13.87* (8.009)	16.79** (7.363)	9.524 (11.03)	-0.0561 (0.0459)	-0.0443 (0.0399)	0.0154 (0.0276)
ROA	-211.8 (137.2)	-140.1 (166.5)	-29.71 (161.2)	-1.590*** (0.424)	-1.145*** (0.400)	-0.503 (0.381)
Duality	-52.60 (53.54)	-4.852 (54.05)	-32.50 (38.83)	-0.171 (0.167)	0.0297 (0.166)	-0.0330 (0.142)
BoardSize	45.85*** (17.17)	45.62*** (16.51)	6.411 (9.345)	-0.0193 (0.0374)	-0.0189 (0.0346)	-0.00720 (0.0349)
Blockholder	123.2** (59.92)	123.3* (65.40)	-19.61 (44.54)	0.115 (0.150)	0.0837 (0.152)	0.0223 (0.131)
Coverage			3.128*** (0.570)			
ln_Cov						0.681*** (0.103)
Year Fixed Effect		YES	YES		YES	YES
Selection bias			1%			
Constant	-199.4 (165.3)	-270.8 (167.2)	-182.5*** (50.55)	8.491*** (0.339)	7.585*** (0.552)	-2.528 (1.742)
Censored Obs.	80	80	80	80	80	80
Total Obs.	175	175	175	175	175	175

Robust standard errors in parentheses; Premium is in thousands whereas Coverage and MVE are in millions of dollars.
*** p<0.01, ** p<0.05, * p<0.1

² heckman prem1000 mve Crosslisting Growth DebtRatio roa BoardSize Blockholder, sel (purchase = ln_Assets Crosslisting Growth Independence) vce(rob)

PANEL C. The determinants of D&O liability insurance Rate-on-line

VARIABLES	(1) Rate-on-line	(2) Rate-on-line	(3) ln_RoL	(4) ln_RoL
MVE	-0.000240 (0.000259)	-0.000236 (0.000226)		
ln_MVE			0.0490 (0.0960)	0.0406 (0.0872)
Crosslisting	5.651*** (2.092)	6.117*** (1.793)	0.709*** (0.228)	0.731*** (0.201)
Growth	0.225 (0.303)	0.646** (0.295)	0.00971 (0.0339)	0.0465 (0.0319)
DebtRatio	-2.385 (4.483)	-0.283 (4.343)	-0.0490 (0.401)	-0.00250 (0.391)
ROA	-15.90*** (4.365)	-6.329 (4.277)	-1.339*** (0.428)	-0.178 (0.439)
Duality	-3.347* (2.018)	-1.319 (1.895)	-0.399** (0.177)	-0.0571 (0.170)
BoardSize	0.636 (0.491)	0.627 (0.424)	-0.00535 (0.0472)	-4.03e-05 (0.0422)
Blockholder	0.0534 (1.947)	-0.152 (1.779)	-0.0345 (0.172)	0.000314 (0.160)
Year Fixed Effect		YES		YES
Selection Bias			5%	
Constant	0.479 (6.230)	-7.737 (7.216)	0.672 (0.771)	-0.255 (1.038)
Censored Obs.	80	80	80	80
Total Obs.	175	175	175	175

Standard errors in parentheses; Rate-on-line is in dollars per thousand dollars of coverage whereas MVE is in millions of dollars.

*** p<0.01, ** p<0.05, * p<0.1

Table 9 – Simultaneous choices of Premium and Coverage

The table presents the results of the three-stage least square regressions for Premium and Coverage controlling for a set of independent variables. The table reports the values of the coefficients for each regression with, in parentheses, the standard errors. ***, ** and * indicate the degrees of significance for 1%, 5% and 10% respectively.

The determinants of D&O liability insurance coverage and premium simultaneously								
VARIABLES	(1)		(2)		(3)		(4)	
	Coverage	Premium	Coverage	Premium	Coverage	Premium	In_Cov	In_Prem
MVE	0.00364*** (0.000938)	0.0158** (0.00751)	0.00368*** (0.000939)	0.0105 (0.00900)	0.00340*** (0.000911)	0.0103 (0.00998)		
In_MVE							0.487*** (0.0677)	0.0451 (0.271)
Crosslisting	6.337 (6.627)	205.0*** (52.81)	6.445 (6.628)	196.6*** (49.93)	-1.263 (6.994)	196.3*** (55.09)	-0.0274 (0.129)	0.730*** (0.141)
Growth	-0.746 (1.208)	14.46 (9.596)	-0.654 (1.212)	17.36* (9.497)	-0.0463 (1.189)	17.68* (9.362)	-0.0860*** (0.0254)	0.0455 (0.0575)
DebtRatio	70.41*** (16.10)		76.89*** (17.67)		63.23*** (17.75)		0.676** (0.327)	
ROA	-9.311 (18.08)	-107.4 (144.9)	-9.631 (18.08)	-98.40 (135.1)	-9.242 (17.42)	-101.3 (135.3)	-1.029*** (0.365)	-0.184 (0.661)
BoardSize	0.321 (1.773)	47.50*** (13.58)	0.121 (1.788)	43.44*** (13.32)	-0.164 (1.726)	43.44*** (13.19)	-0.0313 (0.0333)	-0.000179 (0.0369)
Blockholder	-2.772 (7.326)	110.3* (57.80)	-3.348 (7.355)	104.8* (54.06)	1.629 (7.322)	106.2* (57.24)	0.00913 (0.134)	-0.000144 (0.143)
Duality		-21.10 (56.82)		-22.91 (57.00)		-33.33 (64.30)		-0.0441 (0.148)
Coverage				1.633 (1.711)		1.644 (2.265)		
In_Cov								0.991* (0.524)
MillsRatio					-48.80*** (18.04)	-0.120 (216.3)	-0.318 (0.373)	1.011** (0.479)
Year Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES
Constant	-6.477 (38.65)	-411.0* (210.1)	-9.140 (38.77)	-585.6** (285.5)	27.19 (39.70)	-581.8* (329.1)	14.52*** (0.566)	-7.347 (7.714)
Observations	95	95	95	95	95	95	95	95
R-squared	0.495	0.473	0.496	0.545	0.532	0.545	0.718	0.718

Standard errors in parentheses; Premium is in thousands whereas Coverage and MVE are in millions of dollars.

*** p<0.01, ** p<0.05, * p<0.1

Table 10 – Simultaneous choices of Premium and Coverage, smaller sample

The table presents the results of the three-stage least square regressions for Premium and Coverage controlling for a set of independent variables for a limited sample of firms that purchased D&O insurance before and after cross-listing and that reported enough information to calculate its rate-on-line in both cases.³ The table reports the values of the coefficients for each regression with, in parentheses, the standard errors. ***, ** and * indicate the degrees of significance for 1%, 5% and 10% respectively.

The determinants of D&O liability insurance coverage and premium simultaneously								
VARIABLES	(1)		(2)		(3)		(4)	
	Coverage	Premium	Coverage	Premium	ln_Cov	ln_Prem	ln_Cov	ln_Prem
MVE	0.00350*** (0.000916)	0.0162** (0.00674)	0.00278*** (0.000823)	-0.00491 (0.0143)				
ln_MVE					0.466*** (0.0634)	0.450*** (0.0815)	0.360*** (0.0594)	-0.362 (0.430)
Crosslisting	2.148 (6.955)	173.3*** (50.67)	-13.45** (6.852)	287.8*** (103.3)	0.0175 (0.130)	0.583*** (0.170)	-0.149 (0.116)	1.067*** (0.334)
Growth	-0.123 (1.064)	13.77* (7.698)	0.501 (1.064)	17.36* (9.949)	-0.0440* (0.0226)	-0.0253 (0.0286)	-0.0381* (0.0214)	0.0790 (0.0673)
ROA	11.56 (16.05)	-165.8 (116.3)	-13.47 (15.87)	-35.47 (155.0)	-0.319 (0.328)	-1.461*** (0.431)	-0.923*** (0.303)	0.999 (1.194)
Duality		-38.61 (54.98)		0.0927 (64.49)		-0.215 (0.184)		0.0432 (0.184)
BoardSize	-2.460 (1.925)	35.47*** (13.61)	-4.017** (1.663)	59.47*** (22.51)	-0.0352 (0.0364)	-0.00839 (0.0477)	-0.0296 (0.0295)	0.0543 (0.0679)
Blockholder	-2.892 (7.303)	45.08 (53.09)	6.054 (7.807)	-70.96 (85.97)	-0.0864 (0.132)	0.0259 (0.172)	-0.0455 (0.128)	-0.234 (0.242)
DebtRatio	70.57*** (15.52)		36.02* (19.37)		0.867*** (0.298)		0.572* (0.316)	
Coverage				7.843 (4.807)				
ln_Cov								2.256** (1.141)
MillsRatio			-90.77*** (20.29)	704.1* (566.0)			-1.295*** (0.390)	3.571* (1.987)
Year Fixed Effect			YES	YES			YES	YES
Observations	80	80	80	80	80	80	80	80
R-squared	0.400	0.400	0.579	0.308	0.651	0.516	0.792	0.275

Standard errors in parentheses; Premium is in thousands whereas Coverage and MVE are in millions of dollars.

*** p<0.01, ** p<0.05, * p<0.1

³ reg3 (cov1000 mve Crosslisting ...) (prem1000 mve Crosslisting ...) if ((Crosslisting == 0 & purchase ==1 & fpurchase == 1) | (Crosslisting ==1 & lpurchase == 1 & purchase ==1))

**Table 11 – Heckman’s two-step efficient estimates method for D&O insurance:
Comparing coefficients before and after cross-listing**

The table presents the second stage regression results of a Heckman selection model for *Coverage*, *Premium* and *Rate-on-line* and their respective log transformation over a set of independent variables. The results separate the sample before and after cross-listing. The table report each regression’s coefficients with, in parentheses, their associated robust standard error. ***, ** and * indicate the degree of significance for 1%, 5% and 10% respectively.

The determinants of D&O liability insurance coverage and premium, before and after cross-listing in the United States								
VARIABLES	Panel A : Before cross-listing				Panel B: After-crosslisting			
	(1) Coverage	(2) In_Cov	(3) Premium	(4) In_Prem	(1) Coverage	(2) In_Cov	(3) Premium	(4) In_Prem
MVE	0.00422 (0.00480)		0.0131*** (0.00192)		0.00292 (0.00275)		0.0235** (0.00928)	
In_MVE		0.531*** (0.103)		0.613*** (0.104)		0.493*** (0.0980)		0.519*** (0.103)
Growth	-1.047 (2.405)	-0.174** (0.0736)	-27.79** (12.14)	-0.253*** (0.0865)	-0.164 (1.349)	-0.0475 (0.0402)	9.601 (8.734)	-0.0396 (0.0397)
DebtRatio	39.43 (26.32)	0.254 (0.341)			53.24** (26.73)	1.054** (0.428)		
ROA	-5.192 (56.42)	-1.503** (0.614)	-126.8 (138.0)	-3.123*** (0.704)	1.666 (16.42)	-0.102 (0.421)	-266.3 (187.7)	-1.265** (0.492)
BoardSize	-1.497 (12.05)	-0.0201 (0.0592)	8.106 (22.70)	-0.0691 (0.0789)	3.548 (2.620)	-0.0228 (0.0325)	47.58** (22.35)	-0.00503 (0.0427)
Blockholder	14.20 (18.37)	-0.0936 (0.199)	-18.79 (26.75)	-0.109 (0.242)	9.016 (9.921)	0.185 (0.142)	152.6 (95.18)	0.188 (0.187)
Duality			-39.59 (83.47)	-0.459 (0.286)			-74.62 (78.88)	-0.0576 (0.199)
Constant	47.21 (115.7)	14.49*** (0.415)	8.545 (138.7)	8.656*** (0.561)	1.409 (24.32)	13.65*** (0.637)	-43.20 (191.6)	8.874*** (0.588)
Observations	86	86	83	83	95	95	92	92

Robust standard errors in parentheses; Premium is in thousands of dollars whereas Coverage and MVE are in millions of dollars.

*** p<0.01, ** p<0.05, * p<0.1